Department of Defense
Fiscal Year (FY) 2019 Budget Estimates

February 2018

Navy

Justification Book Volume 3 of 5

Research, Development, Test & Evaluation, Navy

Budget Activity 5

The estimated cost for this report for the Department of the Navy (DON) is $75,587.

The estimated total cost for supporting the DON budget justification material is approximately $1,643,653 for the 2018 fiscal year. This includes $79,753 in supplies and $1,563,900 in labor.

Table of Volumes

Budget Activities 1, 2, and 3.....Volume 1

Budget Activity 4.....Volume 2

Budget Activity 5.....Volume 3

Budget Activity 6.....Volume 4

Budget Activity 7.....Volume 5

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Volume 3 Table of Contents

Introduction and Explanation of Contents.....Volume 3 - v

Comptroller Exhibit R-1..... Volume 3 - vii

Master Program Element Table of Contents (by Budget Activity then Line Item Number).....Volume 3 - lxxvii

Master Program Element Table of Contents (Alphabetically by Program Element Title)..... Volume 3 - xcv

Program Element Table of Contents (by Budget Activity then Line Item Number).....Volume 3 - cix

Program Element Table of Contents (Alphabetically by Program Element Title).....Volume 3 - cxv

Exhibit R-2's..... Volume 3 - 1

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Research, Development, Test and Evaluation, Navy

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, $18,649,478,000 to remain available for obligation until September 30, 2020.

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Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Research, Development, Test & Eval, Navy	17,851,955	17,116,976	17,091,976	326,537	326,537
Total Research, Development, Test & Evaluation	17,851,955	17,116,976	17,091,976	326,537	326,537
Other RDT&E Budget Activities Not Included in the Research, Development, Test and Evaluation Title					
National Defense Sealift Fund	7,237	18,622	18,622		
Total Not in Research, Development, Test & Evaluation	7,237	18,622	18,622		

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
Research, Development, Test & Eval, Navy	60,000	-60,000		17,478,513	-60,000	17,418,513
Total Research, Development, Test & Evaluation	60,000	-60,000		17,478,513	-60,000	17,418,513
Other RDT&E Budget Activities Not Included in the Research, Development, Test and Evaluation Title						
National Defense Sealift Fund				18,622		18,622
Total Not in Research, Development, Test & Evaluation				18,622		18,622

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Research, Development, Test & Eval, Navy	18,451,066	198,412	18,649,478
Total Research, Development, Test & Evaluation	18,451,066	198,412	18,649,478
Other RDT&E Budget Activities Not Included in the Research, Development, Test and Evaluation Title			
National Defense Sealift Fund			
Total Not in Research, Development, Test & Evaluation			

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Summary Recap of Budget Activities	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Basic Research	549,384	595,901	595,901		
Applied Research	954,884	886,079	886,079		
Advanced Technology Development	811,211	686,342	686,342		
Advanced Component Development & Prototypes	4,510,800	4,218,714	4,193,714	27,710	59,510
System Development & Demonstration	5,928,185	6,362,102	6,362,102		5,400
Management Support	1,279,290	945,757	945,757		
Operational Systems Development	3,818,201	3,980,140	3,980,140	102,655	102,655
Undistributed		-558,059	-558,059	196,172	158,972
Total Research, Development, Test & Evaluation	17,851,955	17,116,976	17,091,976	326,537	326,537

Summary Recap of FYDP Programs					
Strategic Forces	187,327	201,735	201,735		
General Purpose Forces	1,407,847	1,675,797	1,675,797	12,800	12,800
Intelligence and Communications	927,792	751,779	751,779		
Research and Development	13,686,598	13,589,349	13,564,349	27,710	64,910
Central Supply and Maintenance	40,169	43,035	43,035		
Administration and Associated Activities	136	-556,310	-556,310	196,172	158,972
Space		47,244	47,244		
Classified Programs	1,602,086	1,364,347	1,364,347	89,855	89,855
Total Research, Development, Test & Evaluation	17,851,955	17,116,976	17,091,976	326,537	326,537

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Summary Recap of Budget Activities	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
Basic Research				595,901		595,901
Applied Research				886,079		886,079
Advanced Technology Development				686,342		686,342
Advanced Component Development & Prototypes				4,253,224		4,253,224
System Development & Demonstration				6,367,502		6,367,502
Management Support				945,757		945,757
Operational Systems Development	60,000	-60,000		4,142,795	-60,000	4,082,795
Undistributed				-399,087		-399,087
Total Research, Development, Test & Evaluation	60,000	-60,000		17,478,513	-60,000	17,418,513

Summary Recap of FYDP Programs						
Strategic Forces				201,735		201,735
General Purpose Forces				1,688,597		1,688,597
Intelligence and Communications				751,779		751,779
Research and Development				13,629,259		13,629,259
Central Supply and Maintenance				43,035		43,035
Administration and Associated Activities				-397,338		-397,338
Space				47,244		47,244
Classified Programs	60,000	-60,000		1,514,202	-60,000	1,454,202
Total Research, Development, Test & Evaluation	60,000	-60,000		17,478,513	-60,000	17,418,513

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Summary Recap of Budget Activities	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Basic Research	597,378		597,378
Applied Research	891,471		891,471
Advanced Technology Development	750,995		750,995
Advanced Component Development & Prototypes	4,293,713	33,300	4,327,013
System Development & Demonstration	6,042,480	1,100	6,043,580
Management Support	1,020,569		1,020,569
Operational Systems Development	4,854,460	164,012	5,018,472
Undistributed			
Total Research, Development, Test & Evaluation	18,451,066	198,412	18,649,478

Summary Recap of FYDP Programs			
Strategic Forces	251,501		251,501
General Purpose Forces	1,982,258	16,130	1,998,388
Intelligence and Communications	626,028		626,028
Research and Development	13,979,095	34,400	14,013,495
Central Supply and Maintenance	43,844		43,844
Administration and Associated Activities	1,579		1,579
Space	47,858		47,858
Classified Programs	1,518,903	147,882	1,666,785
Total Research, Development, Test & Evaluation	18,451,066	198,412	18,649,478

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Summary Recap of Non-RDT&E Title FYDP Programs					
Mobility Forces	7,237	18,622	18,622		
Total Research, Development, Test & Evaluation	7,237	18,622	18,622		

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
Summary Recap of Non-RDT&E Title FYDP Programs						
Mobility Forces				18,622		18,622
Total Research, Development, Test & Evaluation				18,622		18,622

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Summary Recap of Non-RDT&E Title FYDP Programs			
Mobility Forces			
Total Research, Development, Test & Evaluation			

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
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Advanced Technology Development	811,211	686,342	686,342		
Advanced Component Development & Prototypes	4,510,800	4,218,714	4,193,714	27,710	59,510
System Development & Demonstration	5,928,185	6,362,102	6,362,102		5,400
Management Support	1,279,290	945,757	945,757		
Operational Systems Development	3,818,201	3,980,140	3,980,140	102,655	102,655
Undistributed		-558,059	-558,059	196,172	158,972
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Central Supply and Maintenance	40,169	43,035	43,035		
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Classified Programs	1,602,086	1,364,347	1,364,347	89,855	89,855
Total Research, Development, Test & Evaluation	17,851,955	17,116,976	17,091,976	326,537	326,537

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
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Management Support				945,757		945,757
Operational Systems Development	60,000	-60,000		4,142,795	-60,000	4,082,795
Undistributed				-399,087		-399,087
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Summary Recap of FYDP Programs

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Research and Development				13,629,259		13,629,259
Central Supply and Maintenance				43,035		43,035
Administration and Associated Activities				-397,338		-397,338
Space				47,244		47,244
Classified Programs	60,000	-60,000		1,514,202	-60,000	1,454,202
Total Research, Development, Test & Evaluation	60,000	-60,000		17,478,513	-60,000	17,418,513

Department of the Navy
FY 2019 President's Budget
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Total Obligational Authority
(Dollars in Thousands)

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Classified Programs	1,518,903	147,882	1,666,785
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Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
1	0601103N	University Research Initiatives	01	117,320	118,130	118,130			U
2	0601152N	In-House Laboratory Independent Research	01	18,238	19,438	19,438			U
3	0601153N	Defense Research Sciences	01	413,826	458,333	458,333			U
	Basic	Research		549,384	595,901	595,901			
4	0602114N	Power Projection Applied Research	02	69,950	13,553	13,553			U
5	0602123N	Force Protection Applied Research	02	192,579	125,557	125,557			U
6	0602131M	Marine Corps Landing Force Technology	02	67,874	53,936	53,936			U
7	0602235N	Common Picture Applied Research	02	40,649	36,450	36,450			U
8	0602236N	Warfighter Sustainment Applied Research	02	50,465	48,649	48,649			U
9	0602271N	Electromagnetic Systems Applied Research	02	114,613	79,598	79,598			U
10	0602435N	Ocean Warfighting Environment Applied Research	02	79,941	42,411	42,411			U
11	0602651M	Joint Non-Lethal Weapons Applied Research	02	6,146	6,425	6,425			U
12	0602747N	Undersea Warfare Applied Research	02	120,537	56,094	56,094			U
13	0602750N	Future Naval Capabilities Applied Research	02	152,427	156,805	156,805			U
14	0602782N	Mine and Expeditionary Warfare Applied Research	02	31,256	32,733	32,733			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
1	0601103N	University Research Initiatives	01				118,130		118,130	U
2	0601152N	In-House Laboratory Independent Research	01				19,438		19,438	U
3	0601153N	Defense Research Sciences	01				458,333		458,333	U
	Basic Research						595,901		595,901	
4	0602114N	Power Projection Applied Research	02				13,553		13,553	U
5	0602123N	Force Protection Applied Research	02				125,557		125,557	U
6	0602131M	Marine Corps Landing Force Technology	02				53,936		53,936	U
7	0602235N	Common Picture Applied Research	02				36,450		36,450	U
8	0602236N	Warfighter Sustainment Applied Research	02				48,649		48,649	U
9	0602271N	Electromagnetic Systems Applied Research	02				79,598		79,598	U
10	0602435N	Ocean Warfighting Environment Applied Research	02				42,411		42,411	U
11	0602651M	Joint Non-Lethal Weapons Applied Research	02				6,425		6,425	U
12	0602747N	Undersea Warfare Applied Research	02				56,094		56,094	U
13	0602750N	Future Naval Capabilities Applied Research	02				156,805		156,805	U
14	0602782N	Mine and Expeditionary Warfare Applied Research	02				32,733		32,733	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
1	0601103N	University Research Initiatives	01	119,433		119,433	U
2	0601152N	In-House Laboratory Independent Research	01	19,237		19,237	U
3	0601153N	Defense Research Sciences	01	458,708		458,708	U
	Basic	Research		597,378		597,378	
4	0602114N	Power Projection Applied Research	02	14,643		14,643	U
5	0602123N	Force Protection Applied Research	02	124,049		124,049	U
6	0602131M	Marine Corps Landing Force Technology	02	59,607		59,607	U
7	0602235N	Common Picture Applied Research	02	36,348		36,348	U
8	0602236N	Warfighter Sustainment Applied Research	02	56,197		56,197	U
9	0602271N	Electromagnetic Systems Applied Research	02	83,800		83,800	U
10	0602435N	Ocean Warfighting Environment Applied Research	02	42,998		42,998	U
11	0602651M	Joint Non-Lethal Weapons Applied Research	02	6,349		6,349	U
12	0602747N	Undersea Warfare Applied Research	02	58,049		58,049	U
13	0602750N	Future Naval Capabilities Applied Research	02	147,771		147,771	U
14	0602782N	Mine and Expeditionary Warfare Applied Research	02	37,545		37,545	U

Department of the Navy
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Total Obligational Authority
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Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
15	0602792N	Innovative Naval Prototypes (INP) Applied Research	02		171,146	171,146			U
16	0602861N	Science and Technology Management - ONR Field Acitivities	02		62,722	62,722			U
17	0602898N	Science and Technology Management - ONR Headquarters	02	28,447					U
		Applied Research		954,884	886,079	886,079			
18	0603114N	Power Projection Advanced Technology	03	97,122					U
19	0603123N	Force Protection Advanced Technology	03	83,146	26,342	26,342			U
20	0603271N	Electromagnetic Systems Advanced Technology	03	25,726	9,360	9,360			U
21	0603640M	USMC Advanced Technology Demonstration (ATD)	03	137,190	154,407	154,407			U
22	0603651M	Joint Non-Lethal Weapons Technology Development	03	12,790	13,448	13,448			U
23	0603671N	Navy Advanced Technology Development (ATD)	03						U
24	0603673N	Future Naval Capabilities Advanced Technology Development	03	254,203	231,772	231,772			U
25	0603680N	Manufacturing Technology Program	03	55,555	57,797	57,797			U
26	0603729N	Warfighter Protection Advanced Technology	03	39,486	4,878	4,878			U
27	0603747N	Undersea Warfare Advanced Technology	03	25,352					U
28	0603758N	Navy Warfighting Experiments and Demonstrations	03	67,965	64,889	64,889			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
15	0602792N	Innovative Naval Prototypes (INP) Applied Research	02				171,146		171,146	U
16	0602861N	Science and Technology Management - ONR Field Acitivities	02				62,722		62,722	U
17	0602898N	Science and Technology Management - ONR Headquarters	02							U
		Applied Research					886,079		886,079	
18	0603114N	Power Projection Advanced Technology	03							U
19	0603123N	Force Protection Advanced Technology	03				26,342		26,342	U
20	0603271N	Electromagnetic Systems Advanced Technology	03				9,360		9,360	U
21	0603640M	USMC Advanced Technology Demonstration (ATD)	03				154,407		154,407	U
22	0603651M	Joint Non-Lethal Weapons Technology Development	03				13,448		13,448	U
23	0603671N	Navy Advanced Technology Development (ATD)	03							U
24	0603673N	Future Naval Capabilities Advanced Technology Development	03				231,772		231,772	U
25	0603680N	Manufacturing Technology Program	03				57,797		57,797	U
26	0603729N	Warfighter Protection Advanced Technology	03				4,878		4,878	U
27	0603747N	Undersea Warfare Advanced Technology	03							U
28	0603758N	Navy Warfighting Experiments and Demonstrations	03				64,889		64,889	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
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(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
15	0602792N	Innovative Naval Prototypes (INP) Applied Research	02	159,697		159,697	U
16	0602861N	Science and Technology Management - ONR Field Acitivities	02	64,418		64,418	U
17	0602898N	Science and Technology Management - ONR Headquarters	02				U
		Applied Research		891,471		891,471	
18	0603114N	Power Projection Advanced Technology	03				U
19	0603123N	Force Protection Advanced Technology	03	2,423		2,423	U
20	0603271N	Electromagnetic Systems Advanced Technology	03				U
21	0603640M	USMC Advanced Technology Demonstration (ATD)	03	150,245		150,245	U
22	0603651M	Joint Non-Lethal Weapons Technology Development	03	13,313		13,313	U
23	0603671N	Navy Advanced Technology Development (ATD)	03	131,502		131,502	U
24	0603673N	Future Naval Capabilities Advanced Technology Development	03	232,996		232,996	U
25	0603680N	Manufacturing Technology Program	03	58,657		58,657	U
26	0603729N	Warfighter Protection Advanced Technology	03				U
27	0603747N	Undersea Warfare Advanced Technology	03				U
28	0603758N	Navy Warfighting Experiments and Demonstrations	03				U

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Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
29	0603782N	Mine and Expeditionary Warfare Advanced Technology	03	12,676	15,164	15,164			U
30	0603801N	Innovative Naval Prototypes (INP) Advanced Technology Development	03		108,285	108,285			U
		Advanced Technology Development		811,211	686,342	686,342			
31	0603207N	Air/Ocean Tactical Applications	04	44,175	48,365	48,365			U
32	0603216N	Aviation Survivability	04	14,811	5,566	5,566			U
33	0603251N	Aircraft Systems	04	1,519	695	695			U
34	0603254N	ASW Systems Development	04	6,877	7,661	7,661			U
35	0603261N	Tactical Airborne Reconnaissance	04	3,265	3,707	3,707			U
36	0603382N	Advanced Combat Systems Technology	04	3,583	61,381	61,381			U
37	0603502N	Surface and Shallow Water Mine Countermeasures	04	126,761	154,117	154,117			U
38	0603506N	Surface Ship Torpedo Defense	04	69,872	14,974	14,974			U
39	0603512N	Carrier Systems Development	04	7,516	9,296	9,296			U
40	0603525N	PILOT FISH	04	137,435	132,083	132,083			U
41	0603527N	RETRACT LARCH	04	48,583	15,407	15,407	22,000	22,000	U
42	0603536N	RETRACT JUNIPER	04	107,871	122,413	122,413			U
43	0603542N	Radiological Control	04	677	745	745			U
44	0603553N	Surface ASW	04	1,039	1,136	1,136			U
45	0603561N	Advanced Submarine System Development	04	120,289	100,955	100,955			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
29	0603782N	Mine and Expeditionary Warfare Advanced Technology	03				15,164		15,164	U
30	0603801N	Innovative Naval Prototypes (INP) Advanced Technology Development	03				108,285		108,285	U
		Advanced Technology Development					686,342		686,342	
31	0603207N	Air/Ocean Tactical Applications	04				48,365		48,365	U
32	0603216N	Aviation Survivability	04				5,566		5,566	U
33	0603251N	Aircraft Systems	04				695		695	U
34	0603254N	ASW Systems Development	04				7,661		7,661	U
35	0603261N	Tactical Airborne Reconnaissance	04				3,707		3,707	U
36	0603382N	Advanced Combat Systems Technology	04				61,381		61,381	U
37	0603502N	Surface and Shallow Water Mine Countermeasures	04				154,117		154,117	U
38	0603506N	Surface Ship Torpedo Defense	04				14,974		14,974	U
39	0603512N	Carrier Systems Development	04				9,296		9,296	U
40	0603525N	PILOT FISH	04				132,083		132,083	U
41	0603527N	RETRACT LARCH	04				37,407		37,407	U
42	0603536N	RETRACT JUNIPER	04				122,413		122,413	U
43	0603542N	Radiological Control	04				745		745	U
44	0603553N	Surface ASW	04				1,136		1,136	U
45	0603561N	Advanced Submarine System Development	04				100,955		100,955	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
29	0603782N	Mine and Expeditionary Warfare Advanced Technology	03				U
30	0603801N	Innovative Naval Prototypes (INP) Advanced Technology Development	03	161,859		161,859	U
		Advanced Technology Development		750,995		750,995	
31	0603207N	Air/Ocean Tactical Applications	04	29,747		29,747	U
32	0603216N	Aviation Survivability	04	7,050		7,050	U
33	0603251N	Aircraft Systems	04	793		793	U
34	0603254N	ASW Systems Development	04	7,058		7,058	U
35	0603261N	Tactical Airborne Reconnaissance	04	3,540		3,540	U
36	0603382N	Advanced Combat Systems Technology	04	59,741		59,741	U
37	0603502N	Surface and Shallow Water Mine Countermeasures	04	62,727		62,727	U
38	0603506N	Surface Ship Torpedo Defense	04	8,570		8,570	U
39	0603512N	Carrier Systems Development	04	5,440		5,440	U
40	0603525N	PILOT FISH	04	162,222		162,222	U
41	0603527N	RETRACT LARCH	04	11,745	18,000	29,745	U
42	0603536N	RETRACT JUNIPER	04	114,265		114,265	U
43	0603542N	Radiological Control	04	740		740	U
44	0603553N	Surface ASW	04	1,122		1,122	U
45	0603561N	Advanced Submarine System Development	04	109,086		109,086	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
46	0603562N	Submarine Tactical Warfare Systems	04	8,603	13,834	13,834			U
47	0603563N	Ship Concept Advanced Design	04	14,359	36,891	36,891			U
48	0603564N	Ship Preliminary Design & Feasibility Studies	04	13,451	12,012	12,012			U
49	0603570N	Advanced Nuclear Power Systems	04	453,313	329,500	329,500			U
50	0603573N	Advanced Surface Machinery Systems	04	30,255	29,953	29,953			U
51	0603576N	CHALK EAGLE	04	353,146	191,610	191,610			U
52	0603581N	Littoral Combat Ship (LCS)	04	50,806	40,991	40,991			U
53	0603582N	Combat System Integration	04	23,839	24,674	24,674			U
54	0603595N	Ohio Replacement	04	681,164	776,158	776,158			U
55	0603596N	LCS Mission Modules	04	153,595	116,871	116,871			U
56	0603597N	Automated Test and Analysis	04	14,507	8,052	8,052			U
57	0603599N	Frigate Development	04	83,080	143,450	143,450			U
58	0603609N	Conventional Munitions	04	8,342	8,909	8,909			U
59	0603611M	Marine Corps Assault Vehicles	04	131,381					U
60	0603635M	Marine Corps Ground Combat/Support System	04	1,043	1,428	1,428			U
61	0603654N	Joint Service Explosive Ordnance Development	04	48,686	53,367	53,367		29,700	U
62	0603713N	Ocean Engineering Technology Development	04	4,639	8,212	8,212			U
63	0603721N	Environmental Protection	04	19,117	20,214	20,214			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 12:40:34

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
46	0603562N	Submarine Tactical Warfare Systems	04				13,834		13,834	U
47	0603563N	Ship Concept Advanced Design	04				36,891		36,891	U
48	0603564N	Ship Preliminary Design & Feasibility Studies	04				12,012		12,012	U
49	0603570N	Advanced Nuclear Power Systems	04				329,500		329,500	U
50	0603573N	Advanced Surface Machinery Systems	04				29,953		29,953	U
51	0603576N	CHALK EAGLE	04				191,610		191,610	U
52	0603581N	Littoral Combat Ship (LCS)	04				40,991		40,991	U
53	0603582N	Combat System Integration	04				24,674		24,674	U
54	0603595N	Ohio Replacement	04				776,158		776,158	U
55	0603596N	LCS Mission Modules	04				116,871		116,871	U
56	0603597N	Automated Test and Analysis	04				8,052		8,052	U
57	0603599N	Frigate Development	04				143,450		143,450	U
58	0603609N	Conventional Munitions	04				8,909		8,909	U
59	0603611M	Marine Corps Assault Vehicles	04							U
60	0603635M	Marine Corps Ground Combat/Support System	04				1,428		1,428	U
61	0603654N	Joint Service Explosive Ordnance Development	04				83,067		83,067	U
62	0603713N	Ocean Engineering Technology Development	04				8,212		8,212	U
63	0603721N	Environmental Protection	04				20,214		20,214	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
46	0603562N	Submarine Tactical Warfare Systems	04	9,374		9,374	U
47	0603563N	Ship Concept Advanced Design	04	89,419		89,419	U
48	0603564N	Ship Preliminary Design & Feasibility Studies	04	13,348		13,348	U
49	0603570N	Advanced Nuclear Power Systems	04	256,137		256,137	U
50	0603573N	Advanced Surface Machinery Systems	04	22,109		22,109	U
51	0603576N	CHALK EAGLE	04	29,744		29,744	U
52	0603581N	Littoral Combat Ship (LCS)	04	27,997		27,997	U
53	0603582N	Combat System Integration	04	16,351		16,351	U
54	0603595N	Ohio Replacement	04	514,846		514,846	U
55	0603596N	LCS Mission Modules	04	103,633		103,633	U
56	0603597N	Automated Test and Analysis	04	7,931		7,931	U
57	0603599N	Frigate Development	04	134,772		134,772	U
58	0603609N	Conventional Munitions	04	9,307		9,307	U
59	0603611M	Marine Corps Assault Vehicles	04				U
60	0603635M	Marine Corps Ground Combat/Support System	04	1,828		1,828	U
61	0603654N	Joint Service Explosive Ordnance Development	04	43,148	13,900	57,048	U
62	0603713N	Ocean Engineering Technology Development	04	5,915		5,915	U
63	0603721N	Environmental Protection	04	19,811		19,811	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
64	0603724N	Navy Energy Program	04	69,500	50,623	25,623			U
65	0603725N	Facilities Improvement	04	4,213	2,837	2,837			U
66	0603734N	CHALK CORAL	04	225,665	245,143	245,143			U
67	0603739N	Navy Logistic Productivity	04	2,973	2,995	2,995			U
68	0603746N	RETRACT MAPLE	04	301,871	306,101	306,101			U
69	0603748N	LINK PLUMERIA	04	259,756	253,675	253,675			U
70	0603751N	RETRACT ELM	04	51,720	55,691	55,691			U
71	0603764N	LINK EVERGREEN	04	46,282	48,982	48,982			U
72	0603787N	Special Processes	04	13,088					U
73	0603790N	NATO Research and Development	04	8,567	9,099	9,099			U
74	0603795N	Land Attack Technology	04	17,260	33,568	33,568		2,100	U
75	0603851M	Joint Non-Lethal Weapons Testing	04	26,760	29,873	29,873			U
76	0603860N	Joint Precision Approach and Landing Systems - Dem/Val	04	102,195	106,391	106,391			U
77	0603925N	Directed Energy and Electric Weapon Systems	04	34,039	107,310	107,310			U
78	0604014N	F/A -18 Infrared Search and Track (IRST)	04						U
79	0604027N	Digital Warfare Office	04						U
80	0604028N	Small and Medium Unmanned Undersea Vehicles	04						U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
64	0603724N	Navy Energy Program	04				25,623		25,623	U
65	0603725N	Facilities Improvement	04				2,837		2,837	U
66	0603734N	CHALK CORAL	04				245,143		245,143	U
67	0603739N	Navy Logistic Productivity	04				2,995		2,995	U
68	0603746N	RETRACT MAPLE	04				306,101		306,101	U
69	0603748N	LINK PLUMERIA	04				253,675		253,675	U
70	0603751N	RETRACT ELM	04				55,691		55,691	U
71	0603764N	LINK EVERGREEN	04				48,982		48,982	U
72	0603787N	Special Processes	04							U
73	0603790N	NATO Research and Development	04				9,099		9,099	U
74	0603795N	Land Attack Technology	04				35,668		35,668	U
75	0603851M	Joint Non-Lethal Weapons Testing	04				29,873		29,873	U
76	0603860N	Joint Precision Approach and Landing Systems - Dem/Val	04				106,391		106,391	U
77	0603925N	Directed Energy and Electric Weapon Systems	04				107,310		107,310	U
78	0604014N	F/A -18 Infrared Search and Track (IRST)	04							U
79	0604027N	Digital Warfare Office	04							U
80	0604028N	Small and Medium Unmanned Undersea Vehicles	04							U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
64	0603724N	Navy Energy Program	04	25,656		25,656	U
65	0603725N	Facilities Improvement	04	5,301		5,301	U
66	0603734N	CHALK CORAL	04	267,985		267,985	U
67	0603739N	Navy Logistic Productivity	04	4,059		4,059	U
68	0603746N	RETRACT MAPLE	04	377,878		377,878	U
69	0603748N	LINK PLUMERIA	04	381,770		381,770	U
70	0603751N	RETRACT ELM	04	60,535		60,535	U
71	0603764N	LINK EVERGREEN	04				U
72	0603787N	Special Processes	04				U
73	0603790N	NATO Research and Development	04	9,652		9,652	U
74	0603795N	Land Attack Technology	04	15,529	1,400	16,929	U
75	0603851M	Joint Non-Lethal Weapons Testing	04	27,581		27,581	U
76	0603860N	Joint Precision Approach and Landing Systems - Dem/Val	04	101,566		101,566	U
77	0603925N	Directed Energy and Electric Weapon Systems	04	223,344		223,344	U
78	0604014N	F/A -18 Infrared Search and Track (IRST)	04	108,700		108,700	U
79	0604027N	Digital Warfare Office	04	26,691		26,691	U
80	0604028N	Small and Medium Unmanned Undersea Vehicles	04	16,717		16,717	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
81	0604029N	Unmanned Undersea Vehicle Core Technologies	04						U
82	0604030N	Rapid Prototyping, Experimentation and Demonstration.	04						U
83	0604031N	Large Unmanned Undersea Vehicles	04						U
84	0604112N	Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80)	04	69,185	83,935	83,935			U
85	0604122N	Remote Minehunting System (RMS)	04	2,926					U
86	0604126N	Littoral Airborne MCM	04						U
87	0604127N	Surface Mine Countermeasures	04						U
88	0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04	59,753	46,844	46,844	5,710	5,710	U
89	0604286M	Marine Corps Additive Manufacturing Technology Development	04		6,200	6,200			U
90	0604289M	Next Generation Logistics	04						U
91	0604292N	MH-XX	04	1,618					U
92	0604320M	Rapid Technology Capability Prototype	04		7,055	7,055			U
93	0604454N	LX (R)	04	24,730	9,578	9,578			U
94	0604536N	Advanced Undersea Prototyping	04	57,363	66,543	66,543			U
95	0604659N	Precision Strike Weapons Development Program	04	4,874	31,315	31,315			U
96	0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04	20,104	42,851	42,851			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
81	0604029N	Unmanned Undersea Vehicle Core Technologies	04							U
82	0604030N	Rapid Prototyping, Experimentation and Demonstration.	04							U
83	0604031N	Large Unmanned Undersea Vehicles	04							U
84	0604112N	Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80)	04				83,935		83,935	U
85	0604122N	Remote Minehunting System (RMS)	04							U
86	0604126N	Littoral Airborne MCM	04							U
87	0604127N	Surface Mine Countermeasures	04							U
88	0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04				52,554		52,554	U
89	0604286M	Marine Corps Additive Manufacturing Technology Development	04				6,200		6,200	U
90	0604289M	Next Generation Logistics	04							U
91	0604292N	MH-XX	04							U
92	0604320M	Rapid Technology Capability Prototype	04				7,055		7,055	U
93	0604454N	LX (R)	04				9,578		9,578	U
94	0604536N	Advanced Undersea Prototyping	04				66,543		66,543	U
95	0604659N	Precision Strike Weapons Development Program	04				31,315		31,315	U
96	0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04				42,851		42,851	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
81	0604029N	Unmanned Undersea Vehicle Core Technologies	04	30,187		30,187	U
82	0604030N	Rapid Prototyping, Experimentation and Demonstration.	04	48,796		48,796	U
83	0604031N	Large Unmanned Undersea Vehicles	04	92,613		92,613	U
84	0604112N	Gerald R. Ford Class Nuclear Aircraft Carrier (CVN 78 - 80)	04	58,121		58,121	U
85	0604122N	Remote Minehunting System (RMS)	04				U
86	0604126N	Littoral Airborne MCM	04	17,622		17,622	U
87	0604127N	Surface Mine Countermeasures	04	18,154		18,154	U
88	0604272N	Tactical Air Directional Infrared Countermeasures (TADIRCM)	04	47,278		47,278	U
89	0604286M	Marine Corps Additive Manufacturing Technology Development	04				U
90	0604289M	Next Generation Logistics	04	11,081		11,081	U
91	0604292N	MH-XX	04				U
92	0604320M	Rapid Technology Capability Prototype	04	7,107		7,107	U
93	0604454N	LX (R)	04	5,549		5,549	U
94	0604536N	Advanced Undersea Prototyping	04	87,669		87,669	U
95	0604659N	Precision Strike Weapons Development Program	04	132,818		132,818	U
96	0604707N	Space and Electronic Warfare (SEW) Architecture/Engineering Support	04	7,230		7,230	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
97	0604786N	Offensive Anti-Surface Warfare Weapon Development	04	301,554	160,694	160,694			U
98	0605812M	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	04	7,658					U
99	0303354N	ASW Systems Development - MIP	04	9,110	8,278	8,278			U
100	0304240M	Advanced Tactical Unmanned Aircraft System	04		7,979	7,979			U
101	0304240N	Advanced Tactical Unmanned Aircraft System	04						U
102	0304270N	Electronic Warfare Development - MIP	04	437	527	527			U
		Advanced Component Development & Prototypes		4,510,800	4,218,714	4,193,714	27,710	59,510	
103	0603208N	Training System Aircraft	05	17,490	16,945	16,945			U
104	0604212N	Other Helo Development	05	5,889	26,786	26,786			U
105	0604214M	AV-8B Aircraft - Eng Dev	05						U
106	0604214N	AV-8B Aircraft - Eng Dev	05	32,179	48,780	48,780			U
107	0604215N	Standards Development	05	1,300	2,722	2,722			U
108	0604216N	Multi-Mission Helicopter Upgrade Development	05	5,189	5,371	5,371			U
109	0604218N	Air/Ocean Equipment Engineering	05	3,747	782	782			U
110	0604221N	P-3 Modernization Program	05	1,864	1,361	1,361			U
111	0604230N	Warfare Support System	05	11,404	14,167	14,167		5,400	U
112	0604231N	Tactical Command System	05	36,190	55,695	55,695			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
97	0604786N	Offensive Anti-Surface Warfare Weapon Development	04				160,694		160,694	U
98	0605812M	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	04							U
99	0303354N	ASW Systems Development - MIP	04				8,278		8,278	U
100	0304240M	Advanced Tactical Unmanned Aircraft System	04				7,979		7,979	U
101	0304240N	Advanced Tactical Unmanned Aircraft System	04							U
102	0304270N	Electronic Warfare Development - MIP	04				527		527	U
		Advanced Component Development & Prototypes					4,253,224		4,253,224	
103	0603208N	Training System Aircraft	05				16,945		16,945	U
104	0604212N	Other Helo Development	05				26,786		26,786	U
105	0604214M	AV-8B Aircraft - Eng Dev	05							U
106	0604214N	AV-8B Aircraft - Eng Dev	05				48,780		48,780	U
107	0604215N	Standards Development	05				2,722		2,722	U
108	0604216N	Multi-Mission Helicopter Upgrade Development	05				5,371		5,371	U
109	0604218N	Air/Ocean Equipment Engineering	05				782		782	U
110	0604221N	P-3 Modernization Program	05				1,361		1,361	U
111	0604230N	Warfare Support System	05				19,567		19,567	U
112	0604231N	Tactical Command System	05				55,695		55,695	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
97	0604786N	Offensive Anti-Surface Warfare Weapon Development	04	143,062		143,062	U
98	0605812M	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	04				U
99	0303354N	ASW Systems Development - MIP	04	8,889		8,889	U
100	0304240M	Advanced Tactical Unmanned Aircraft System	04	25,291		25,291	U
101	0304240N	Advanced Tactical Unmanned Aircraft System	04	9,300		9,300	U
102	0304270N	Electronic Warfare Development - MIP	04	466		466	U
		Advanced Component Development & Prototypes		4,293,713	33,300	4,327,013	
103	0603208N	Training System Aircraft	05	12,798		12,798	U
104	0604212N	Other Helo Development	05	32,128		32,128	U
105	0604214M	AV-8B Aircraft - Eng Dev	05	46,363		46,363	U
106	0604214N	AV-8B Aircraft - Eng Dev	05				U
107	0604215N	Standards Development	05	3,771		3,771	U
108	0604216N	Multi-Mission Helicopter Upgrade Development	05	16,611		16,611	U
109	0604218N	Air/Ocean Equipment Engineering	05	17,368		17,368	U
110	0604221N	P-3 Modernization Program	05	2,134		2,134	U
111	0604230N	Warfare Support System	05	9,729		9,729	U
112	0604231N	Tactical Command System	05	57,688		57,688	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
113	0604234N	Advanced Hawkeye	05	354,390	292,535	292,535			U
114	0604245M	H-1 Upgrades	05						U
115	0604245N	H-1 Upgrades	05	27,013	61,288	61,288			U
116	0604261N	Acoustic Search Sensors	05	28,940	37,167	37,167			U
117	0604262N	V-22A	05	149,113	171,386	171,386			U
118	0604264N	Air Crew Systems Development	05	8,746	13,235	13,235			U
119	0604269N	EA-18	05	100,825	173,488	173,488			U
120	0604270N	Electronic Warfare Development	05	44,894	54,055	54,055			U
121	0604273M	Executive Helo Development	05						U
122	0604273N	Executive Helo Development	05	327,770	451,938	451,938			U
123	0604274N	Next Generation Jammer (NGJ)	05	559,017	632,936	632,936			U
124	0604280N	Joint Tactical Radio System - Navy (JTRS-Navy)	05	2,295	4,310	4,310			U
125	0604282N	Next Generation Jammer (NGJ) Increment II	05	18,964	66,686	66,686			U
126	0604307N	Surface Combatant Combat System Engineering	05	288,678	390,238	390,238			U
127	0604311N	LPD-17 Class Systems Integration	05	565	689	689			U
128	0604329N	Small Diameter Bomb (SDB)	05	86,989	112,846	112,846			U
129	0604366N	Standard Missile Improvements	05	113,601	158,578	158,578			U
130	0604373N	Airborne MCM	05	44,930	15,734	15,734			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
113	0604234N	Advanced Hawkeye	05				292,535		292,535	U
114	0604245M	H-1 Upgrades	05							U
115	0604245N	H-1 Upgrades	05				61,288		61,288	U
116	0604261N	Acoustic Search Sensors	05				37,167		37,167	U
117	0604262N	V-22A	05				171,386		171,386	U
118	0604264N	Air Crew Systems Development	05				13,235		13,235	U
119	0604269N	EA-18	05				173,488		173,488	U
120	0604270N	Electronic Warfare Development	05				54,055		54,055	U
121	0604273M	Executive Helo Development	05							U
122	0604273N	Executive Helo Development	05				451,938		451,938	U
123	0604274N	Next Generation Jammer (NGJ)	05				632,936		632,936	U
124	0604280N	Joint Tactical Radio System - Navy (JTRS-Navy)	05				4,310		4,310	U
125	0604282N	Next Generation Jammer (NGJ) Increment II	05				66,686		66,686	U
126	0604307N	Surface Combatant Combat System Engineering	05				390,238		390,238	U
127	0604311N	LPD-17 Class Systems Integration	05				689		689	U
128	0604329N	Small Diameter Bomb (SDB)	05				112,846		112,846	U
129	0604366N	Standard Missile Improvements	05				158,578		158,578	U
130	0604373N	Airborne MCM	05				15,734		15,734	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
113	0604234N	Advanced Hawkeye	05	223,565		223,565	U
114	0604245M	H-1 Upgrades	05	58,097		58,097	U
115	0604245N	H-1 Upgrades	05				U
116	0604261N	Acoustic Search Sensors	05	42,485		42,485	U
117	0604262N	V-22A	05	143,079		143,079	U
118	0604264N	Air Crew Systems Development	05	20,980		20,980	U
119	0604269N	EA-18	05	147,419		147,419	U
120	0604270N	Electronic Warfare Development	05	89,824		89,824	U
121	0604273M	Executive Helo Development	05	245,064		245,064	U
122	0604273N	Executive Helo Development	05				U
123	0604274N	Next Generation Jammer (NGJ)	05	459,529		459,529	U
124	0604280N	Joint Tactical Radio System - Navy (JTRS-Navy)	05	3,272		3,272	U
125	0604282N	Next Generation Jammer (NGJ) Increment II	05	115,253		115,253	U
126	0604307N	Surface Combatant Combat System Engineering	05	397,403		397,403	U
127	0604311N	LPD-17 Class Systems Integration	05	939		939	U
128	0604329N	Small Diameter Bomb (SDB)	05	104,448		104,448	U
129	0604366N	Standard Missile Improvements	05	165,881		165,881	U
130	0604373N	Airborne MCM	05	10,831		10,831	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
131	0604378N	Naval Integrated Fire Control - Counter Air Systems Engineering	05	25,086	25,445	25,445			U
132	0604501N	Advanced Above Water Sensors	05	70,658	87,233	87,233			U
133	0604503N	SSN-688 and Trident Modernization	05	120,261	130,981	130,981			U
134	0604504N	Air Control	05	42,206	75,186	75,186			U
135	0604512N	Shipboard Aviation Systems	05	114,327	177,926	177,926			U
136	0604518N	Combat Information Center Conversion	05	6,092	8,062	8,062			U
137	0604522N	Air and Missile Defense Radar (AMDR) System	05	141,338	32,090	32,090			U
138	0604530N	Advanced Arresting Gear (AAG)	05						U
139	0604558N	New Design SSN	05	127,883	120,087	120,087			U
140	0604562N	Submarine Tactical Warfare System	05	50,069	50,850	50,850			U
141	0604567N	Ship Contract Design/ Live Fire T&E	05	82,946	67,166	67,166			U
142	0604574N	Navy Tactical Computer Resources	05	3,059	4,817	4,817			U
143	0604580N	Virginia Payload Module (VPM)	05	94,846	72,861	72,861			U
144	0604601N	Mine Development	05	14,860	25,635	25,635			U
145	0604610N	Lightweight Torpedo Development	05	29,567	28,076	28,076			U
146	0604654N	Joint Service Explosive Ordnance Development	05	7,369	7,561	7,561			U
147	0604703N	Personnel, Training, Simulation, and Human Factors	05	4,805	40,828	40,828			U
148	0604727N	Joint Standoff Weapon Systems	05	396	435	435			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
131	0604378N	Naval Integrated Fire Control - Counter Air Systems Engineering	05				25,445		25,445	U
132	0604501N	Advanced Above Water Sensors	05				87,233		87,233	U
133	0604503N	SSN-688 and Trident Modernization	05				130,981		130,981	U
134	0604504N	Air Control	05				75,186		75,186	U
135	0604512N	Shipboard Aviation Systems	05				177,926		177,926	U
136	0604518N	Combat Information Center Conversion	05				8,062		8,062	U
137	0604522N	Air and Missile Defense Radar (AMDR) System	05				32,090		32,090	U
138	0604530N	Advanced Arresting Gear (AAG)	05							U
139	0604558N	New Design SSN	05				120,087		120,087	U
140	0604562N	Submarine Tactical Warfare System	05				50,850		50,850	U
141	0604567N	Ship Contract Design/ Live Fire T&E	05				67,166		67,166	U
142	0604574N	Navy Tactical Computer Resources	05				4,817		4,817	U
143	0604580N	Virginia Payload Module (VPM)	05				72,861		72,861	U
144	0604601N	Mine Development	05				25,635		25,635	U
145	0604610N	Lightweight Torpedo Development	05				28,076		28,076	U
146	0604654N	Joint Service Explosive Ordnance Development	05				7,561		7,561	U
147	0604703N	Personnel, Training, Simulation, and Human Factors	05				40,828		40,828	U
148	0604727N	Joint Standoff Weapon Systems	05				435		435	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
131	0604378N	Naval Integrated Fire Control - Counter Air Systems Engineering	05	33,429		33,429	U
132	0604501N	Advanced Above Water Sensors	05	35,635		35,635	U
133	0604503N	SSN-688 and Trident Modernization	05	126,932		126,932	U
134	0604504N	Air Control	05	62,448		62,448	U
135	0604512N	Shipboard Aviation Systems	05	9,710		9,710	U
136	0604518N	Combat Information Center Conversion	05	19,303		19,303	U
137	0604522N	Air and Missile Defense Radar (AMDR) System	05	27,059		27,059	U
138	0604530N	Advanced Arresting Gear (AAG)	05	184,106		184,106	U
139	0604558N	New Design SSN	05	148,233		148,233	U
140	0604562N	Submarine Tactical Warfare System	05	60,824		60,824	U
141	0604567N	Ship Contract Design/ Live Fire T&E	05	60,062		60,062	U
142	0604574N	Navy Tactical Computer Resources	05	4,642		4,642	U
143	0604580N	Virginia Payload Module (VPM)	05				U
144	0604601N	Mine Development	05	25,756		25,756	U
145	0604610N	Lightweight Torpedo Development	05	95,147		95,147	U
146	0604654N	Joint Service Explosive Ordnance Development	05	7,107		7,107	U
147	0604703N	Personnel, Training, Simulation, and Human Factors	05	6,539		6,539	U
148	0604727N	Joint Standoff Weapon Systems	05	441		441	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
149	0604755N	Ship Self Defense (Detect & Control)	05	133,452	161,713	161,713			U
150	0604756N	Ship Self Defense (Engage: Hard Kill)	05	115,081	212,412	212,412			U
151	0604757N	Ship Self Defense (Engage: Soft Kill/EW)	05	108,630	103,391	103,391			U
152	0604761N	Intelligence Engineering	05	9,029	34,855	34,855			U
153	0604771N	Medical Development	05	24,510	9,353	9,353			U
154	0604777N	Navigation/ID System	05	41,905	92,546	92,546			U
155	0604800M	Joint Strike Fighter (JSF) - EMD	05	519,393	152,934	152,934			U
156	0604800N	Joint Strike Fighter (JSF) - EMD	05	512,662	108,931	108,931			U
157	0604810M	Joint Strike Fighter Follow On Modernization (FoM) - Marine Corps	05	29,691	144,958	144,958			U
158	0604810N	Joint Strike Fighter Follow On Modernization (FoM) - Navy	05	25,041	143,855	143,855			U
159	0605013M	Information Technology Development	05	3,744	14,865	14,865			U
160	0605013N	Information Technology Development	05	87,469	152,977	152,977			U
161	0605024N	Anti-Tamper Technology Support	05	500	3,410	3,410			U
162	0605212M	CH-53K RDTE	05						U
163	0605212N	CH-53K RDTE	05	339,101	340,758	340,758			U
164	0605215N	Mission Planning	05	32,876	33,430	33,430			U
165	0605217N	Common Avionics	05	42,711	58,163	58,163			U
166	0605220N	Ship to Shore Connector (SSC)	05	12,588	22,410	22,410			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
149	0604755N	Ship Self Defense (Detect & Control)	05				161,713		161,713	U
150	0604756N	Ship Self Defense (Engage: Hard Kill)	05				212,412		212,412	U
151	0604757N	Ship Self Defense (Engage: Soft Kill/EW)	05				103,391		103,391	U
152	0604761N	Intelligence Engineering	05				34,855		34,855	U
153	0604771N	Medical Development	05				9,353		9,353	U
154	0604777N	Navigation/ID System	05				92,546		92,546	U
155	0604800M	Joint Strike Fighter (JSF) - EMD	05				152,934		152,934	U
156	0604800N	Joint Strike Fighter (JSF) - EMD	05				108,931		108,931	U
157	0604810M	Joint Strike Fighter Follow On Modernization (FoM) - Marine Corps	05				144,958		144,958	U
158	0604810N	Joint Strike Fighter Follow On Modernization (FoM) - Navy	05				143,855		143,855	U
159	0605013M	Information Technology Development	05				14,865		14,865	U
160	0605013N	Information Technology Development	05				152,977		152,977	U
161	0605024N	Anti-Tamper Technology Support	05				3,410		3,410	U
162	0605212M	CH-53K RDTE	05							U
163	0605212N	CH-53K RDTE	05				340,758		340,758	U
164	0605215N	Mission Planning	05				33,430		33,430	U
165	0605217N	Common Avionics	05				58,163		58,163	U
166	0605220N	Ship to Shore Connector (SSC)	05				22,410		22,410	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
149	0604755N	Ship Self Defense (Detect & Control)	05	180,391	1,100	181,491	U
150	0604756N	Ship Self Defense (Engage: Hard Kill)	05	178,538		178,538	U
151	0604757N	Ship Self Defense (Engage: Soft Kill/EW)	05	120,507		120,507	U
152	0604761N	Intelligence Engineering	05	29,715		29,715	U
153	0604771N	Medical Development	05	8,095		8,095	U
154	0604777N	Navigation/ID System	05	121,026		121,026	U
155	0604800M	Joint Strike Fighter (JSF) - EMD	05	66,566		66,566	U
156	0604800N	Joint Strike Fighter (JSF) - EMD	05	65,494		65,494	U
157	0604810M	Joint Strike Fighter Follow On Modernization (FoM) - Marine Corps	05				U
158	0604810N	Joint Strike Fighter Follow On Modernization (FoM) - Navy	05				U
159	0605013M	Information Technology Development	05	14,005		14,005	U
160	0605013N	Information Technology Development	05	268,567		268,567	U
161	0605024N	Anti-Tamper Technology Support	05	5,618		5,618	U
162	0605212M	CH-53K RDTE	05	326,945		326,945	U
163	0605212N	CH-53K RDTE	05				U
164	0605215N	Mission Planning	05	32,714		32,714	U
165	0605217N	Common Avionics	05	51,486		51,486	U
166	0605220N	Ship to Shore Connector (SSC)	05	1,444		1,444	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
167	0605327N	T-AO 205 Class	05	1,062	1,961	1,961			U
168	0605414N	Unmanned Carrier Aviation (UCA)	05	75,863	222,208	222,208			U
169	0605450M	Joint Air-to-Ground Missile (JAGM)	05						U
170	0605450N	Joint Air-to-Ground Missile (JAGM)	05	17,834	15,473	15,473			U
171	0605500N	Multi-mission Maritime Aircraft (MMA)	05	61,959	11,795	11,795			U
172	0605504N	Multi-Mission Maritime (MMA) Increment III	05	109,827	181,731	181,731			U
173	0605611M	Marine Corps Assault Vehicles System Development & Demonstration	05		178,993	178,993			U
174	0605813M	Joint Light Tactical Vehicle (JLTV) System Development & Demonstration	05		20,710	20,710			U
175	0204202N	DDG-1000	05	45,187	140,500	140,500			U
176	0303267N	Auctioned Spectrum Relocation Fund***	05	251,203					U
177	0303367N	Spectrum Access Research and Development***	05	46,902					U
178	0303467N	SENSR Spectrum Pipeline SRF***	05	150					U
179	0304231N	Tactical Command System - MIP	05	676					U
180	0304785N	Tactical Cryptologic Systems	05	34,038	28,311	28,311			U
181	0305124N	Special Applications Program	05	35,002					U
182	0306250M	Cyber Operations Technology Development	05	2,349	4,502	4,502			U
		System Development & Demonstration		5,928,185	6,362,102	6,362,102		5,400	

***Funding in this Program Element was transferred during the year of execution from the Spectrum Relocation Fund (SRF) in support of the Advanced Wireless Services 3 (AWS-3) auction and is associated with the reallocation or sharing of the 1755-1780 MHz and 1695-1710 MHz bands. The SRF is administered by the Office of Management and Budget (OMB), which approves SRF transfers to federal agencies on an annual basis in consultation with the National Telecommunications and Information Administration (NTIA).

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
167	0605327N	T-AO 205 Class	05				1,961		1,961	U
168	0605414N	Unmanned Carrier Aviation (UCA)	05				222,208		222,208	U
169	0605450M	Joint Air-to-Ground Missile (JAGM)	05							U
170	0605450N	Joint Air-to-Ground Missile (JAGM)	05				15,473		15,473	U
171	0605500N	Multi-mission Maritime Aircraft (MMA)	05				11,795		11,795	U
172	0605504N	Multi-Mission Maritime (MMA) Increment III	05				181,731		181,731	U
173	0605611M	Marine Corps Assault Vehicles System Development & Demonstration	05				178,993		178,993	U
174	0605813M	Joint Light Tactical Vehicle (JLTV) System Development & Demonstration	05				20,710		20,710	U
175	0204202N	DDG-1000	05				140,500		140,500	U
176	0303267N	Auctioned Spectrum Relocation Fund***	05							U
177	0303367N	Spectrum Access Research and Development***	05							U
178	0303467N	SENSR Spectrum Pipeline SRF***	05							U
179	0304231N	Tactical Command System - MIP	05							U
180	0304785N	Tactical Cryptologic Systems	05				28,311		28,311	U
181	0305124N	Special Applications Program	05							U
182	0306250M	Cyber Operations Technology Development	05				4,502		4,502	U
		System Development & Demonstration					6,367,502		6,367,502	

***Funding in this Program Element was transferred during the year of execution from the Spectrum Relocation Fund (SRF) in support of the Advanced Wireless Services 3 (AWS-3) auction and is associated with the reallocation or sharing of the 1755-1780 MHz and 1695-1710 MHz bands. The SRF is administered by the Office of Management and Budget (OMB), which approves SRF transfers to federal agencies on an annual basis in consultation with the National Telecommunications and Information Administration (NTIA).

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
167	0605327N	T-AO 205 Class	05	1,298		1,298	U
168	0605414N	Unmanned Carrier Aviation (UCA)	05	718,942		718,942	U
169	0605450M	Joint Air-to-Ground Missile (JAGM)	05	6,759		6,759	U
170	0605450N	Joint Air-to-Ground Missile (JAGM)	05				U
171	0605500N	Multi-mission Maritime Aircraft (MMA)	05	37,296		37,296	U
172	0605504N	Multi-Mission Maritime (MMA) Increment III	05	160,389		160,389	U
173	0605611M	Marine Corps Assault Vehicles System Development & Demonstration	05	98,223		98,223	U
174	0605813M	Joint Light Tactical Vehicle (JLTV) System Development & Demonstration	05	2,260		2,260	U
175	0204202N	DDG-1000	05	161,264		161,264	U
176	0303267N	Auctioned Spectrum Relocation Fund***	05				U
177	0303367N	Spectrum Access Research and Development***	05				U
178	0303467N	SENSR Spectrum Pipeline SRF***	05				U
179	0304231N	Tactical Command System - MIP	05				U
180	0304785N	Tactical Cryptologic Systems	05	44,098		44,098	U
181	0305124N	Special Applications Program	05				U
182	0306250M	Cyber Operations Technology Development	05	6,808		6,808	U
		System Development & Demonstration		6,042,480	1,100	6,043,580	

***Funding in this Program Element was transferred during the year of execution from the Spectrum Relocation Fund (SRF) in support of the Advanced Wireless Services 3 (AWS-3) auction and is associated with the reallocation or sharing of the 1755-1780 MHz and 1695-1710 MHz bands. The SRF is administered by the Office of Management and Budget (OMB), which approves SRF transfers to federal agencies on an annual basis in consultation with the National Telecommunications and Information Administration (NTIA).

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
183	0604256N	Threat Simulator Development	06	16,581	91,819	91,819			U
184	0604258N	Target Systems Development	06	34,021	23,053	23,053			U
185	0604759N	Major T&E Investment	06	51,375	52,634	52,634			U
186	0605126N	Joint Theater Air and Missile Defense Organization	06	2,888	141	141			U
187	0605152N	Studies and Analysis Support - Navy	06	3,861	3,917	3,917			U
188	0605154N	Center for Naval Analyses	06	43,532	50,432	50,432			U
189	0605285N	Next Generation Fighter	06	1,394					U
190	0605502N	Small Business Innovative Research	06	370,665					U
191	0605804N	Technical Information Services	06	1,494	782	782			U
192	0605853N	Management, Technical & International Support	06	97,939	94,562	94,562			U
193	0605856N	Strategic Technical Support	06	3,460	4,313	4,313			U
194	0605861N	RDT&E Science and Technology Management	06	62,961	1,104	1,104			U
195	0605863N	RDT&E Ship and Aircraft Support	06	105,693	105,666	105,666			U
196	0605864N	Test and Evaluation Support	06	398,972	373,667	373,667			U
197	0605865N	Operational Test and Evaluation Capability	06	17,984	20,298	20,298			U
198	0605866N	Navy Space and Electronic Warfare (SEW) Support	06	9,658	17,341	17,341			U
199	0605867N	SEW Surveillance/Reconnaissance Support	06	6,500					U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
183	0604256N	Threat Simulator Development	06				91,819		91,819	U
184	0604258N	Target Systems Development	06				23,053		23,053	U
185	0604759N	Major T&E Investment	06				52,634		52,634	U
186	0605126N	Joint Theater Air and Missile Defense Organization	06				141		141	U
187	0605152N	Studies and Analysis Support - Navy	06				3,917		3,917	U
188	0605154N	Center for Naval Analyses	06				50,432		50,432	U
189	0605285N	Next Generation Fighter	06							U
190	0605502N	Small Business Innovative Research	06							U
191	0605804N	Technical Information Services	06				782		782	U
192	0605853N	Management, Technical & International Support	06				94,562		94,562	U
193	0605856N	Strategic Technical Support	06				4,313		4,313	U
194	0605861N	RDT&E Science and Technology Management	06				1,104		1,104	U
195	0605863N	RDT&E Ship and Aircraft Support	06				105,666		105,666	U
196	0605864N	Test and Evaluation Support	06				373,667		373,667	U
197	0605865N	Operational Test and Evaluation Capability	06				20,298		20,298	U
198	0605866N	Navy Space and Electronic Warfare (SEW) Support	06				17,341		17,341	U
199	0605867N	SEW Surveillance/Reconnaissance Support	06							U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
183	0604256N	Threat Simulator Development	06	94,576		94,576	U
184	0604258N	Target Systems Development	06	10,981		10,981	U
185	0604759N	Major T&E Investment	06	77,014		77,014	U
186	0605126N	Joint Theater Air and Missile Defense Organization	06	48		48	U
187	0605152N	Studies and Analysis Support - Navy	06	3,942		3,942	U
188	0605154N	Center for Naval Analyses	06	48,797		48,797	U
189	0605285N	Next Generation Fighter	06	5,000		5,000	U
190	0605502N	Small Business Innovative Research	06				U
191	0605804N	Technical Information Services	06	1,029		1,029	U
192	0605853N	Management, Technical & International Support	06	87,565		87,565	U
193	0605856N	Strategic Technical Support	06	4,231		4,231	U
194	0605861N	RDT&E Science and Technology Management	06	1,072		1,072	U
195	0605863N	RDT&E Ship and Aircraft Support	06	97,471		97,471	U
196	0605864N	Test and Evaluation Support	06	373,834		373,834	U
197	0605865N	Operational Test and Evaluation Capability	06	21,554		21,554	U
198	0605866N	Navy Space and Electronic Warfare (SEW) Support	06	16,227		16,227	U
199	0605867N	SEW Surveillance/Reconnaissance Support	06				U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
200	0605873M	Marine Corps Program Wide Support	06	19,142	21,751	21,751			U
201	0605898N	Management HQ - R&D	06	16,188	44,279	44,279			U
202	0606355N	Warfare Innovation Management	06	14,846	28,841	28,841			U
203	0606942M	Assessments and Evaluations Cyber Vulnerabilities	06						U
204	0606942N	Assessments and Evaluations Cyber Vulnerabilities	06						U
205	0305327N	Insider Threat	06						U
206	0902498N	Management Headquarters (Departmental Support Activities)	06		1,749	1,749			U
207	0909999N	Financing for Cancelled Account Adjustments	06	136					U
208	1206867N	SEW Surveillance/Reconnaissance Support	06		9,408	9,408			U
		Management Support		1,279,290	945,757	945,757			
210	0604227N	HARPOON Modifications	07						U
211	0604840M	F-35 C2D2	07						U
212	0604840N	F-35 C2D2	07						U
213	0607658N	Cooperative Engagement Capability (CEC)	07	75,099	92,571	92,571			U
214	0607700N	Deployable Joint Command and Control	07	2,935	3,137	3,137			U
215	0101221N	Strategic Sub & Weapons System Support	07	130,364	135,219	135,219			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
200	0605873M	Marine Corps Program Wide Support	06				21,751		21,751	U
201	0605898N	Management HQ - R&D	06				44,279		44,279	U
202	0606355N	Warfare Innovation Management	06				28,841		28,841	U
203	0606942M	Assessments and Evaluations Cyber Vulnerabilities	06							U
204	0606942N	Assessments and Evaluations Cyber Vulnerabilities	06							U
205	0305327N	Insider Threat	06							U
206	0902498N	Management Headquarters (Departmental Support Activities)	06				1,749		1,749	U
207	0909999N	Financing for Cancelled Account Adjustments	06							U
208	1206867N	SEW Surveillance/Reconnaissance Support	06				9,408		9,408	U
		Management Support					945,757		945,757	
210	0604227N	HARPOON Modifications	07							U
211	0604840M	F-35 C2D2	07							U
212	0604840N	F-35 C2D2	07							U
213	0607658N	Cooperative Engagement Capability (CEC)	07				92,571		92,571	U
214	0607700N	Deployable Joint Command and Control	07				3,137		3,137	U
215	0101221N	Strategic Sub & Weapons System Support	07				135,219		135,219	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
200	0605873M	Marine Corps Program Wide Support	06	24,303		24,303	U
201	0605898N	Management HQ - R&D	06	43,262		43,262	U
202	0606355N	Warfare Innovation Management	06	41,918		41,918	U
203	0606942M	Assessments and Evaluations Cyber Vulnerabilities	06	7,000		7,000	U
204	0606942N	Assessments and Evaluations Cyber Vulnerabilities	06	48,800		48,800	U
205	0305327N	Insider Threat	06	1,682		1,682	U
206	0902498N	Management Headquarters (Departmental Support Activities)	06	1,579		1,579	U
207	0909999N	Financing for Cancelled Account Adjustments	06				U
208	1206867N	SEW Surveillance/Reconnaissance Support	06	8,684		8,684	U
		Management Support		1,020,569		1,020,569	
210	0604227N	HARPOON Modifications	07	5,426		5,426	U
211	0604840M	F-35 C2D2	07	259,122		259,122	U
212	0604840N	F-35 C2D2	07	252,360		252,360	U
213	0607658N	Cooperative Engagement Capability (CEC)	07	130,515		130,515	U
214	0607700N	Deployable Joint Command and Control	07	3,127		3,127	U
215	0101221N	Strategic Sub & Weapons System Support	07	157,679		157,679	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
216	0101224N	SSBN Security Technology Program	07	32,910	36,242	36,242			U
217	0101226N	Submarine Acoustic Warfare Development	07	7,300	12,053	12,053			U
218	0101402N	Navy Strategic Communications	07	16,753	18,221	18,221			U
219	0204136N	F/A-18 Squadrons	07	169,473	224,470	224,470			U
220	0204163N	Fleet Telecommunications (Tactical)	07	38,949	33,525	33,525			U
221	0204228N	Surface Support	07	20,595	24,829	24,829			U
222	0204229N	Tomahawk and Tomahawk Mission Planning Center (TMPC)	07	49,149	133,617	133,617			U
223	0204311N	Integrated Surveillance System	07	57,043	38,972	38,972	11,600	11,600	U
224	0204313N	Ship-Towed Array Surveillance Systems	07						U
225	0204413N	Amphibious Tactical Support Units (Displacement Craft)	07	11,143	3,940	3,940			U
226	0204460M	Ground/Air Task Oriented Radar (G/ATOR)	07	78,860	54,645	54,645			U
227	0204571N	Consolidated Training Systems Development	07	44,435	66,518	66,518			U
228	0204574N	Cryptologic Direct Support	07	1,122	1,155	1,155	1,200	1,200	U
229	0204575N	Electronic Warfare (EW) Readiness Support	07	79,410	51,040	51,040			U
230	0205601N	HARM Improvement	07	32,889	87,989	87,989			U
231	0205604N	Tactical Data Links	07	121,396	89,852	89,852			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
216	0101224N	SSBN Security Technology Program	07				36,242		36,242	U
217	0101226N	Submarine Acoustic Warfare Development	07				12,053		12,053	U
218	0101402N	Navy Strategic Communications	07				18,221		18,221	U
219	0204136N	F/A-18 Squadrons	07				224,470		224,470	U
220	0204163N	Fleet Telecommunications (Tactical)	07				33,525		33,525	U
221	0204228N	Surface Support	07				24,829		24,829	U
222	0204229N	Tomahawk and Tomahawk Mission Planning Center (TMPC)	07				133,617		133,617	U
223	0204311N	Integrated Surveillance System	07				50,572		50,572	U
224	0204313N	Ship-Towed Array Surveillance Systems	07							U
225	0204413N	Amphibious Tactical Support Units (Displacement Craft)	07				3,940		3,940	U
226	0204460M	Ground/Air Task Oriented Radar (G/ATOR)	07				54,645		54,645	U
227	0204571N	Consolidated Training Systems Development	07				66,518		66,518	U
228	0204574N	Cryptologic Direct Support	07				2,355		2,355	U
229	0204575N	Electronic Warfare (EW) Readiness Support	07				51,040		51,040	U
230	0205601N	HARM Improvement	07				87,989		87,989	U
231	0205604N	Tactical Data Links	07				89,852		89,852	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
216	0101224N	SSBN Security Technology Program	07	43,198		43,198	U
217	0101226N	Submarine Acoustic Warfare Development	07	11,311		11,311	U
218	0101402N	Navy Strategic Communications	07	39,313		39,313	U
219	0204136N	F/A-18 Squadrons	07	193,086		193,086	U
220	0204163N	Fleet Telecommunications (Tactical)	07	25,014		25,014	U
221	0204228N	Surface Support	07	11,661		11,661	U
222	0204229N	Tomahawk and Tomahawk Mission Planning Center (TMPC)	07	282,395		282,395	U
223	0204311N	Integrated Surveillance System	07	36,959		36,959	U
224	0204313N	Ship-Towed Array Surveillance Systems	07	15,454		15,454	U
225	0204413N	Amphibious Tactical Support Units (Displacement Craft)	07	6,073		6,073	U
226	0204460M	Ground/Air Task Oriented Radar (G/ATOR)	07	45,029		45,029	U
227	0204571N	Consolidated Training Systems Development	07	104,903		104,903	U
228	0204574N	Cryptologic Direct Support	07	4,544		4,544	U
229	0204575N	Electronic Warfare (EW) Readiness Support	07	66,889		66,889	U
230	0205601N	HARM Improvement	07	120,762		120,762	U
231	0205604N	Tactical Data Links	07	104,696		104,696	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
232	0205620N	Surface ASW Combat System Integration	07	23,779	29,351	29,351			U
233	0205632N	MK-48 ADCAP	07	48,507	68,553	68,553			U
234	0205633N	Aviation Improvements	07	121,138	119,099	119,099			U
235	0205675N	Operational Nuclear Power Systems	07	101,786	127,445	127,445			U
236	0206313M	Marine Corps Communications Systems	07	141,171	123,825	123,825			U
237	0206335M	Common Aviation Command and Control System (CAC2S)	07	6,934	7,343	7,343			U
238	0206623M	Marine Corps Ground Combat/ Supporting Arms Systems	07	45,877	66,009	66,009			U
239	0206624M	Marine Corps Combat Services Support	07	11,639	25,258	25,258			U
240	0206625M	USMC Intelligence/Electronic Warfare Systems (MIP)	07	22,978	30,886	30,886			U
241	0206629M	Amphibious Assault Vehicle	07	36,571	58,728	58,728			U
242	0207161N	Tactical AIM Missiles	07	54,678	42,884	42,884			U
243	0207163N	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	34,010	25,364	25,364			U
244	0219902M	Global Combat Support System - Marine Corps (GCSS-MC)	07	9,128					U
248	0303109N	Satellite Communications (SPACE)	07	30,826					U
249	0303138N	Consolidated Afloat Network Enterprise Services (CANES)	07	23,224	24,271	24,271			U
250	0303140N	Information Systems Security Program	07	32,708	50,269	50,269			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
232	0205620N	Surface ASW Combat System Integration	07				29,351		29,351	U
233	0205632N	MK-48 ADCAP	07				68,553		68,553	U
234	0205633N	Aviation Improvements	07				119,099		119,099	U
235	0205675N	Operational Nuclear Power Systems	07				127,445		127,445	U
236	0206313M	Marine Corps Communications Systems	07				123,825		123,825	U
237	0206335M	Common Aviation Command and Control System (CAC2S)	07				7,343		7,343	U
238	0206623M	Marine Corps Ground Combat/ Supporting Arms Systems	07				66,009		66,009	U
239	0206624M	Marine Corps Combat Services Support	07				25,258		25,258	U
240	0206625M	USMC Intelligence/Electronic Warfare Systems (MIP)	07				30,886		30,886	U
241	0206629M	Amphibious Assault Vehicle	07				58,728		58,728	U
242	0207161N	Tactical AIM Missiles	07				42,884		42,884	U
243	0207163N	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07				25,364		25,364	U
244	0219902M	Global Combat Support System - Marine Corps (GCSS-MC)	07							U
248	0303109N	Satellite Communications (SPACE)	07							U
249	0303138N	Consolidated Afloat Network Enterprise Services (CANES)	07				24,271		24,271	U
250	0303140N	Information Systems Security Program	07				50,269		50,269	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
232	0205620N	Surface ASW Combat System Integration	07	28,421		28,421	U
233	0205632N	MK-48 ADCAP	07	94,155		94,155	U
234	0205633N	Aviation Improvements	07	121,805		121,805	U
235	0205675N	Operational Nuclear Power Systems	07	117,028		117,028	U
236	0206313M	Marine Corps Communications Systems	07	174,779	16,130	190,909	U
237	0206335M	Common Aviation Command and Control System (CAC2S)	07	4,826		4,826	U
238	0206623M	Marine Corps Ground Combat/ Supporting Arms Systems	07	97,152		97,152	U
239	0206624M	Marine Corps Combat Services Support	07	30,156		30,156	U
240	0206625M	USMC Intelligence/Electronic Warfare Systems (MIP)	07	39,976		39,976	U
241	0206629M	Amphibious Assault Vehicle	07	22,637		22,637	U
242	0207161N	Tactical AIM Missiles	07	40,121		40,121	U
243	0207163N	Advanced Medium Range Air-to-Air Missile (AMRAAM)	07	32,473		32,473	U
244	0219902M	Global Combat Support System - Marine Corps (GCSS-MC)	07				U
248	0303109N	Satellite Communications (SPACE)	07				U
249	0303138N	Consolidated Afloat Network Enterprise Services (CANES)	07	23,697		23,697	U
250	0303140N	Information Systems Security Program	07	44,228		44,228	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
252	0305192N	Military Intelligence Program (MIP) Activities	07	6,019	6,352	6,352			U
253	0305204N	Tactical Unmanned Aerial Vehicles	07	8,436	7,770	7,770			U
254	0305205N	UAS Integration and Interoperability	07	21,543	39,736	39,736			U
255	0305208M	Distributed Common Ground/Surface Systems	07	2,079	12,867	12,867			U
256	0305208N	Distributed Common Ground/Surface Systems	07	44,564	46,150	46,150			U
257	0305220N	MQ-4C Triton	07	113,606	84,115	84,115			U
258	0305231N	MQ-8 UAV	07	26,518	62,656	62,656			U
259	0305232M	RQ-11 UAV	07		2,022	2,022			U
260	0305234N	Small (Level 0) Tactical UAS (STUASL0)	07	5,071	4,835	4,835			U
261	0305239M	RQ-21A	07	8,379	8,899	8,899			U
262	0305241N	Multi-Intelligence Sensor Development	07	64,765	99,020	99,020			U
263	0305242M	Unmanned Aerial Systems (UAS) Payloads (MIP)	07	11,181	18,578	18,578			U
264	0305421N	RQ-4 Modernization	07	144,477	229,404	229,404			U
265	0308601N	Modeling and Simulation Support	07	4,529	5,238	5,238			U
266	0702207N	Depot Maintenance (Non-IF)	07	37,089	38,227	38,227			U
267	0708730N	Maritime Technology (MARITECH)	07	3,080	4,808	4,808			U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
252	0305192N	Military Intelligence Program (MIP) Activities	07				6,352		6,352	U
253	0305204N	Tactical Unmanned Aerial Vehicles	07				7,770		7,770	U
254	0305205N	UAS Integration and Interoperability	07				39,736		39,736	U
255	0305208M	Distributed Common Ground/Surface Systems	07				12,867		12,867	U
256	0305208N	Distributed Common Ground/Surface Systems	07				46,150		46,150	U
257	0305220N	MQ-4C Triton	07				84,115		84,115	U
258	0305231N	MQ-8 UAV	07				62,656		62,656	U
259	0305232M	RQ-11 UAV	07				2,022		2,022	U
260	0305234N	Small (Level 0) Tactical UAS (STUASL0)	07				4,835		4,835	U
261	0305239M	RQ-21A	07				8,899		8,899	U
262	0305241N	Multi-Intelligence Sensor Development	07				99,020		99,020	U
263	0305242M	Unmanned Aerial Systems (UAS) Payloads (MIP)	07				18,578		18,578	U
264	0305421N	RQ-4 Modernization	07				229,404		229,404	U
265	0308601N	Modeling and Simulation Support	07				5,238		5,238	U
266	0702207N	Depot Maintenance (Non-IF)	07				38,227		38,227	U
267	0708730N	Maritime Technology (MARITECH)	07				4,808		4,808	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
252	0305192N	Military Intelligence Program (MIP) Activities	07	6,081		6,081	U
253	0305204N	Tactical Unmanned Aerial Vehicles	07	8,529		8,529	U
254	0305205N	UAS Integration and Interoperability	07	41,212		41,212	U
255	0305208M	Distributed Common Ground/Surface Systems	07	7,687		7,687	U
256	0305208N	Distributed Common Ground/Surface Systems	07	42,846		42,846	U
257	0305220N	MQ-4C Triton	07	14,395		14,395	U
258	0305231N	MQ-8 UAV	07	9,843		9,843	U
259	0305232M	RQ-11 UAV	07	524		524	U
260	0305234N	Small (Level 0) Tactical UAS (STUASL0)	07	5,360		5,360	U
261	0305239M	RQ-21A	07	10,914		10,914	U
262	0305241N	Multi-Intelligence Sensor Development	07	81,231		81,231	U
263	0305242M	Unmanned Aerial Systems (UAS) Payloads (MIP)	07	5,956		5,956	U
264	0305421N	RQ-4 Modernization	07	219,894		219,894	U
265	0308601N	Modeling and Simulation Support	07	7,097		7,097	U
266	0702207N	Depot Maintenance (Non-IF)	07	36,560		36,560	U
267	0708730N	Maritime Technology (MARITECH)	07	7,284		7,284	U

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
268	1203109N	Satellite Communications (SPACE)	07		37,836	37,836			U
9999	9999999999	Classified Programs		1,602,086	1,364,347	1,364,347	89,855	89,855	U
		Operational Systems Development		3,818,201	3,980,140	3,980,140	102,655	102,655	
269	0901560N	Continuing Resolution Programs	20		-558,059	-558,059	196,172	158,972	U
		Undistributed			-558,059	-558,059	196,172	158,972	
Total Research, Development, Test & Eval, Navy				17,851,955	17,116,976	17,091,976	326,537	326,537	

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
268	1203109N	Satellite Communications (SPACE)	07				37,836		37,836	U
9999	9999999999	Classified Programs		60,000	-60,000		1,514,202	-60,000	1,454,202	U
		Operational Systems Development					4,142,795		4,082,795	
269	0901560N	Continuing Resolution Programs	20				-399,087		-399,087	U
		Undistributed					-399,087		-399,087	
Total Research, Development, Test & Eval, Navy							17,478,513		17,418,513	

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

Appropriation: 1319N Research, Development, Test & Eval, Navy

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
268	1203109N	Satellite Communications (SPACE)	07	39,174		39,174	U
9999	9999999999	Classified Programs		1,518,903	147,882	1,666,785	U
		Operational Systems Development		4,854,460	164,012	5,018,472	
269	0901560N	Continuing Resolution Programs	20				U
		Undistributed					
Total Research, Development, Test & Eval, Navy				18,451,066	198,412	18,649,478	

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Non RDT&E Title
(Dollars in Thousands)

Summary Recap of Budget Activities	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Research and Development	7,237	18,622	18,622		
Total Research, Development, Test & Evaluation	7,237	18,622	18,622		

Summary Recap of Non-RDT&E Title FYDP Programs

Mobility Forces	7,237	18,622	18,622		
Total Research, Development, Test & Evaluation	7,237	18,622	18,622		

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Non RDT&E Title
(Dollars in Thousands)

Summary Recap of Budget Activities	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
Research and Development				18,622		18,622
Total Research, Development, Test & Evaluation				18,622		18,622

Summary Recap of Non-RDT&E Title FYDP Programs

Mobility Forces				18,622		18,622
Total Research, Development, Test & Evaluation				18,622		18,622

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Non RDT&E Title
(Dollars in Thousands)

Summary Recap of Budget Activities	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Research and Development			
Total Research, Development, Test & Evaluation			
Summary Recap of Non-RDT&E Title FYDP Programs			
Mobility Forces			
Total Research, Development, Test & Evaluation			

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Non RDT&E Title
(Dollars in Thousands)

Appropriation: 4557N National Defense Sealift Fund

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	Sec
1	0408042N	National Defense Sealift Fund	04	7,237	18,622	18,622			U
		Research and Development		7,237	18,622	18,622			
Total National Defense Sealift Fund				7,237	18,622	18,622			

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Non RDT&E Title
(Dollars in Thousands)

Appropriation: 4557N National Defense Sealift Fund

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	Sec
1	0408042N	National Defense Sealift Fund	04				18,622		18,622	U
		Research and Development					18,622		18,622	
Total National Defense Sealift Fund							18,622		18,622	

Department of the Navy
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Non RDT&E Title
(Dollars in Thousands)

Appropriation: 4557N National Defense Sealift Fund

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Sec
1	0408042N	National Defense Sealift Fund	04				U
				----------	----------	----------	
		Research and Development					
				----------	----------	----------	
Total National Defense Sealift Fund							

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Master Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
1	01	0601103N	University Research Initiatives	Volume 1 - 1
2	01	0601152N	In-House Lab Independent Res	Volume 1 - 9
3	01	0601153N	Defense Research Sciences	Volume 1 - 15

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
4	02	0602114N	Power Proj Applied Research	Volume 1 - 61
5	02	0602123N	Force Protection Applied Res	Volume 1 - 73
6	02	0602131M	Marine Corps Lndg Force Tech	Volume 1 - 91
7	02	0602235N	Common Picture Applied Research	Volume 1 - 115
8	02	0602236N	Warfighter Sustainment Applied Res	Volume 1 - 129
9	02	0602271N	Electromagnetic Systems Applied Research	Volume 1 - 147
10	02	0602435N	Ocean Wrfghtg Env Applied Res	Volume 1 - 167

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
11	02	0602651M	JT Non-Lethal Wpns Applied Res	Volume 1 - 183
12	02	0602747N	Undersea Warfare Applied Res	Volume 1 - 187
13	02	0602750N	(U)Future Naval Capabilities Applied Research	Volume 1 - 199
14	02	0602782N	Mine & Exp Warfare Applied Res	Volume 1 - 221
15	02	0602792N	(U)Innovative Naval Prototypes(INP) Applied Res	Volume 1 - 229
16	02	0602861N	(U)Science & Tech Management - ONR Field Acts	Volume 1 - 243
17	02	0602898N	(U)Science & Tech Management - ONR Headquarters	Volume 1 - 249

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
18	03	0603114N	Power Projection Advanced Technology	Volume 1 - 253
19	03	0603123N	Force Protection Advanced Technology	Volume 1 - 257
20	03	0603271N	Electromagnetic Systems Advanced Technology	Volume 1 - 267
21	03	0603640M	MC Advanced Technology Demo	Volume 1 - 273
22	03	0603651M	JT Non-Lethal Wpns Tech Dev	Volume 1 - 303
23	03	0603671N	(U)Navy Advanced Technology Development(ATD)	Volume 1 - 309

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
24	03	0603673N	(U)Future Naval Capabilities Advanced Tech Dev	Volume 1 - 325
25	03	0603680N	(U)Manufacturing Technology Program	Volume 1 - 351
26	03	0603729N	Warfighter Protection Adv Tech	Volume 1 - 359
27	03	0603747N	Undersea Warfare Advanced Tech	Volume 1 - 365
28	03	0603758N	Navy Warfighting Exp & Demo	Volume 1 - 369
29	03	0603782N	Mine and Expeditionary Warfare Advanced Technology	Volume 1 - 377
30	03	0603801N	(U) Innovative Naval Prototypes (INP) Adv Tech Dev	Volume 1 - 383

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
31	04	0603207N	Air/Ocean Tactical Applications	Volume 2 - 1
32	04	0603216N	Aviation Survivability	Volume 2 - 87
33	04	0603251N	(U)AIRCRAFT SYSTEMS	Volume 2 - 119
34	04	0603254N	ASW Systems Development	Volume 2 - 127
35	04	0603261N	Tactical Airborne Reconnaissance	Volume 2 - 135
36	04	0603382N	Advanced Combat Systems Tech	Volume 2 - 143

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
37	04	0603502N	Surface & Shallow Water MCM	Volume 2 - 197
38	04	0603506N	Surface Ship Torpedo Defense	Volume 2 - 281
39	04	0603512N	Carrier Systems Development	Volume 2 - 291
40	04	0603525N	(U)PILOT FISH	Volume 2 - 309
41	04	0603527N	(U)RETRACT LARCH	Volume 2 - 311
42	04	0603536N	(U)RETRACT JUNIPER	Volume 2 - 313
43	04	0603542N	Radiological Control	Volume 2 - 315
44	04	0603553N	Surface ASW	Volume 2 - 333
45	04	0603561N	Advanced Submarine System Development	Volume 2 - 343
46	04	0603562N	Submarine Tactical Warfare Sys	Volume 2 - 405
47	04	0603563N	Ship Concept Advanced Design	Volume 2 - 427
48	04	0603564N	Ship Prel Design & Feasibility Studies	Volume 2 - 469
49	04	0603570N	Advanced Nuclear Power Systems	Volume 2 - 491
50	04	0603573N	Advanced Surface Machinery Sys	Volume 2 - 495
51	04	0603576N	(U)CHALK EAGLE	Volume 2 - 511
52	04	0603581N	(U)LITTORAL COMBAT SHIP	Volume 2 - 513
53	04	0603582N	Combat System Integration	Volume 2 - 537
54	04	0603595N	SSBN New Design	Volume 2 - 575

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
55	04	0603596N	(U)LCS Mission Modules	Volume 2 - 591
56	04	0603597N	(U)Automated Test and Analysis	Volume 2 - 639
57	04	0603599N	(U)Frigate Development	Volume 2 - 653
58	04	0603609N	Conventional Munitions	Volume 2 - 667
59	04	0603611M	Marine Corps Assault Vehicles	Volume 2 - 681
60	04	0603635M	Marine Corps Grnd Cmbt/Supt Sys	Volume 2 - 691
61	04	0603654N	JT Service Explosive Ordn Dev	Volume 2 - 705
62	04	0603713N	Ocean Engineering Tech Dev	Volume 2 - 741
63	04	0603721N	Environmental Protection	Volume 2 - 765
64	04	0603724N	Navy Energy Program	Volume 2 - 807
65	04	0603725N	Facilities Improvement	Volume 2 - 843
66	04	0603734N	(U)CHALK CORAL	Volume 2 - 867
67	04	0603739N	Navy Logistic Productivity	Volume 2 - 869
68	04	0603746N	(U)RETRACT MAPLE	Volume 2 - 895
69	04	0603748N	(U)LINK PLUMERIA	Volume 2 - 897
70	04	0603751N	(U)RETRACT ELM	Volume 2 - 899
71	04	0603764N	(U)LINK EVERGREEN	Volume 2 - 901
72	04	0603787N	(U)SPECIAL PROCESSES	Volume 2 - 903

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
73	04	0603790N	NATO Research and Deve	Volume 2 - 905
74	04	0603795N	Land Attack Tech	Volume 2 - 913
75	04	0603851M	Joint Non-Lethal Weapons Testing	Volume 2 - 945
76	04	0603860N	JT Precision Approach & Ldg Sys	Volume 2 - 957
77	04	0603925N	Directed Energy and Electric Weapon System	Volume 2 - 967
78	04	0604014N	F/A-18 Infrared Search and Track (IRST)	Volume 2 - 997
79	04	0604027N	Digital Warfare	Volume 2 - 1009
80	04	0604028N	Small and Medium Unmanned Undersea Vehicles	Volume 2 - 1023
81	04	0604029N	Unmanned Undersea Vehicle Core Technologies	Volume 2 - 1033
82	04	0604030N	Rapid Prototyping, Experimentation and Demonstrati	Volume 2 - 1053
83	04	0604031N	Large Unmanned Undersea Vehicles	Volume 2 - 1061
84	04	0604112N	(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80	Volume 2 - 1071
85	04	0604122N	(U)Remote Minehunting System (RMS)	Volume 2 - 1091
86	04	0604126N	Littoral Airborne MCM	Volume 2 - 1099
87	04	0604127N	Surface Mine Countermeasures	Volume 2 - 1111
88	04	0604272N	Tact Air Dir Infrared CM (TADIRCM)	Volume 2 - 1131
89	04	0604286M	(U)Marine Corps Additive Manufacturing Tech Dev	Volume 2 - 1153
90	04	0604289M	Expeditionary Logistics	Volume 2 - 1161

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
91	04	0604292N	(U)MH-XX	Volume 2 - 1177
92	04	0604320M	Rapid Technology Capability Prototype	Volume 2 - 1183
93	04	0604454N	(U)LX (R)	Volume 2 - 1197
94	04	0604536N	(U)Advanced Undersea Prototyping	Volume 2 - 1209
95	04	0604659N	(U)Precision Strike Weapons Development Program	Volume 2 - 1243
96	04	0604707N	SEW Architecture/Eng Support	Volume 2 - 1265
97	04	0604786N	(U)Offensive Anti-Surface Warfare Weapon Dev	Volume 2 - 1305
98	04	0605812M	(U)Joint Light Tactical Vehicle(JLTV) EMD	Volume 2 - 1317
99	04	0303354N	ASW Systems Development - MIP	Volume 2 - 1327
100	04	0304240M	(U)Advanced Tactical Unmanned Aircraft System	Volume 2 - 1337
101	04	0304240N	(U)Advanced Tactical Unmanned Aircraft System	Volume 2 - 1351
102	04	0304270N	Electronic Warfare Development - MIP	Volume 2 - 1359

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
103	05	0603208N	Training System Aircraft	Volume 3 - 1

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
104	05	0604212N	Other Helicopter Development	Volume 3 - 23
105	05	0604214M	AV-8B Aircraft - Engine Dev	Volume 3 - 47
106	05	0604214N	AV-8B Aircraft - Engine Dev	Volume 3 - 59
107	05	0604215N	Standards Development	Volume 3 - 71
108	05	0604216N	Multi-Mssn Helicopter Upgrade Dev	Volume 3 - 81
109	05	0604218N	Air/Ocean Equipment Engineering	Volume 3 - 93
110	05	0604221N	P-3 Modernization Program	Volume 3 - 127
111	05	0604230N	Warfare Support System	Volume 3 - 133
112	05	0604231N	Tactical Command System	Volume 3 - 161
113	05	0604234N	Advanced Hawkeye	Volume 3 - 227
114	05	0604245M	H-1 Upgrades	Volume 3 - 275
115	05	0604245N	H-1 Upgrades	Volume 3 - 285
116	05	0604261N	Acoustic Search Sensors	Volume 3 - 297
117	05	0604262N	V-22A	Volume 3 - 315
118	05	0604264N	Air Crew Systems Development	Volume 3 - 349
119	05	0604269N	EA-18 Squadrons	Volume 3 - 361
120	05	0604270N	Electronic Warfare (EW) Dev	Volume 3 - 377
121	05	0604273M	(U)Executive Helo Development	Volume 3 - 441

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
122	05	0604273N	(U)Executive Helo Development	Volume 3 - 455
123	05	0604274N	Next Generation Jammer (NGJ)	Volume 3 - 467
124	05	0604280N	JT Tact Radio Sys (JTRS)	Volume 3 - 481
125	05	0604282N	(U)Next Generation Jammer (NGJ) Increment II	Volume 3 - 489
126	05	0604307N	Surface Combatant Cmbt Sys Eng	Volume 3 - 501
127	05	0604311N	LPD-17 Class Systems Integration	Volume 3 - 539
128	05	0604329N	Small Diameter Bomb (SDB)	Volume 3 - 547
129	05	0604366N	Standard Missile Improvements	Volume 3 - 571
130	05	0604373N	Airborne Mine Countermeasures (AMCM)	Volume 3 - 597
131	05	0604378N	Nav Integrated Fire Control-Counter Air Sys Eng	Volume 3 - 631
132	05	0604501N	Advanced Above Water Sensors	Volume 3 - 641
133	05	0604503N	SSN-688 & Trident Modernization	Volume 3 - 677
134	05	0604504N	Air Control	Volume 3 - 741
135	05	0604512N	Shipboard Aviation Systems	Volume 3 - 775
136	05	0604518N	Combat Information Center Conv	Volume 3 - 793
137	05	0604522N	(U)Air and Missile Defense Radar (AMDR) System	Volume 3 - 811
138	05	0604530N	(U)Advanced Arresting Gear (AAG)	Volume 3 - 825
139	05	0604558N	New Design SSN	Volume 3 - 837

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
140	05	0604562N	Submarine Tactical Warfare System	Volume 3 - 863
141	05	0604567N	Ship Contract Design/ Live Fire T&E	Volume 3 - 885
142	05	0604574N	Navy Tactical Computer Resources	Volume 3 - 939
143	05	0604580N	(U)Virginia Payload Module (VPM)	Volume 3 - 951
144	05	0604601N	Mine Development	Volume 3 - 959
145	05	0604610N	Lightweight Torpedo Development	Volume 3 - 975
146	05	0604654N	JT Service EOD	Volume 3 - 1003
147	05	0604703N	Personnel, Trng, Sim, & Human Factors	Volume 3 - 1011
148	05	0604727N	Joint Standoff Weapon Systems	Volume 3 - 1029
149	05	0604755N	Ship Self Def (Detect & Cntrl)	Volume 3 - 1037
150	05	0604756N	Ship Self Def (Engage: Hard Kill)	Volume 3 - 1089
151	05	0604757N	Ship Self Def (Engage: Soft Kill/EW)	Volume 3 - 1133
152	05	0604761N	Intelligence Engineering	Volume 3 - 1187
153	05	0604771N	Medical Development	Volume 3 - 1191
154	05	0604777N	Navigation/Id System	Volume 3 - 1215
155	05	0604800M	(U)Joint Strike Fighter (JSF) - EMD	Volume 3 - 1275
156	05	0604800N	JT Strike Fighter (JSF) - EMD	Volume 3 - 1305
157	05	0604810M	(U)Joint Strike Fighter Follow On Mod (FoM) - MC	Volume 3 - 1335

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
158	05	0604810N	(U)Joint Strike Fighter Follow On Mod (FoM) - Navy	Volume 3 - 1349
159	05	0605013M	Marine Corps IT Dev/Mod	Volume 3 - 1363
160	05	0605013N	Information Technology Development	Volume 3 - 1381
161	05	0605024N	(U)Anti-Tamper Technology Support	Volume 3 - 1553
162	05	0605212M	CH-53K	Volume 3 - 1565
163	05	0605212N	CH-53K	Volume 3 - 1577
164	05	0605215N	(U)Mission Planning	Volume 3 - 1589
165	05	0605217N	(U)Common Avionics	Volume 3 - 1615
166	05	0605220N	(U)Ship to Shore Connector (SSC)	Volume 3 - 1649
167	05	0605327N	(U)T-AO 205 Class	Volume 3 - 1663
168	05	0605414N	(U) Unmanned Carrier Aviation (UCA)	Volume 3 - 1669
169	05	0605450M	Joint Air-to-ground Missile (JAGM)	Volume 3 - 1693
170	05	0605450N	Joint Air-to-ground Missile (JAGM)	Volume 3 - 1703
171	05	0605500N	Multi-mssn Maritime Aircraft (MMA) (P-8A)	Volume 3 - 1713
172	05	0605504N	(U)Multi-Mission Maritime (MMA) Increment III	Volume 3 - 1735
173	05	0605611M	(U) MC AVS Development & Demonstration	Volume 3 - 1745
174	05	0605813M	(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem	Volume 3 - 1765
175	05	0204202N	DDG-1000	Volume 3 - 1777

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
179	05	0304231N	Tactical Command System - MIP	Volume 3 - 1787
180	05	0304785N	Tactical Cryptologic Systems	Volume 3 - 1793
181	05	0305124N	(U)Special Applications Program	Volume 3 - 1815
182	05	0306250M	(U)Cyber Operations Technology Development	Volume 3 - 1819

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
183	06	0604256N	Threat Simulator Development	Volume 4 - 1
184	06	0604258N	Target Systems Development	Volume 4 - 15
185	06	0604759N	Major T&E Investment	Volume 4 - 27
186	06	0605126N	(U)Joint Theater Air and Missile Defense Org	Volume 4 - 37
187	06	0605152N	Studies & Analysis Supt - Navy	Volume 4 - 41
188	06	0605154N	Center For Naval Analyses	Volume 4 - 49
189	06	0605285N	(U)Next Generation Fighter	Volume 4 - 59
190	06	0605502N	Small Business Innovative Research	Volume 4 - 63
191	06	0605804N	Technical Information Services	Volume 4 - 93

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
192	06	0605853N	Management, Technical & Intl Supt	Volume 4 - 99
193	06	0605856N	Strategic Technical Support	Volume 4 - 157
194	06	0605861N	RDT&E Science & Tech Mgmt	Volume 4 - 165
195	06	0605863N	RDT&E Ship & Aircraft Support	Volume 4 - 175
196	06	0605864N	Test & Evaluation Support	Volume 4 - 187
197	06	0605865N	Operational Test & Eval Capability	Volume 4 - 215
198	06	0605866N	Navy Space & Electr Warfare Supt	Volume 4 - 221
199	06	0605867N	Space & Elec War Surv/Recon	Volume 4 - 229
200	06	0605873M	Marine Corps Program Wide Supt	Volume 4 - 235
201	06	0605898N	(U)MANAGEMENT HQ - R&D	Volume 4 - 247
202	06	0606355N	(U)Warfare Innovation Management	Volume 4 - 263
203	06	0606942M	Assessments and Evaluations Cyber Vulnerabilities	Volume 4 - 289
204	06	0606942N	Assessments and Evaluations Cyber Vulnerabilities	Volume 4 - 293
205	06	0305327N	Insider Threat	Volume 4 - 303
206	06	0902498N	Management Headquarters (Departmental Spt Acts)	Volume 4 - 307
207	06	0909999N	Cancelled Account Adjustments	Volume 4 - 311
208	06	1206867N	(U)SEW Surveillance/Reconnaissance Support	Volume 4 - 313

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
210	07	0604227N	Harpoon Modifications	Volume 5 - 1
211	07	0604840M	F-35B C2D2	Volume 5 - 9
212	07	0604840N	F-35C C2D2	Volume 5 - 23
213	07	0607658N	(U)Cooperative Engagement Capability	Volume 5 - 37
214	07	0607700N	(U)Deployable Joint Command and Control	Volume 5 - 63
215	07	0101221N	Strategic Sub & Wpns Sys Supt	Volume 5 - 71
216	07	0101224N	SSBN Security Tech Program	Volume 5 - 103
217	07	0101226N	Submarine Acoustic War Dev	Volume 5 - 105
218	07	0101402N	Navy Strategic Comms	Volume 5 - 117
219	07	0204136N	F/A-18 Squadrons	Volume 5 - 145
220	07	0204163N	Fleet Tactical Development	Volume 5 - 189
221	07	0204228N	Surface Support	Volume 5 - 209
222	07	0204229N	Tomahawk Mssn Planning Ctr	Volume 5 - 223
223	07	0204311N	Integrated Surveillance System	Volume 5 - 279
224	07	0204313N	SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS	Volume 5 - 295
225	07	0204413N	Amphibious Tactical Supt Units	Volume 5 - 303

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
226	07	0204460M	(U)Ground/Air Task Oriented Radar (G/ATOR)	Volume 5 - 317
227	07	0204571N	Consolidated Trng Sys Dev	Volume 5 - 333
228	07	0204574N	Cryptologic Direct Support	Volume 5 - 393
229	07	0204575N	Elect Warfare Readiness Supt	Volume 5 - 403
230	07	0205601N	Harm Improvement	Volume 5 - 429
231	07	0205604N	Tactical Data Links	Volume 5 - 457
232	07	0205620N	Surface ASW Cmbt Sys Integr	Volume 5 - 497
233	07	0205632N	MK-48 ADCAP	Volume 5 - 511
234	07	0205633N	Aviation Improvements	Volume 5 - 527
235	07	0205675N	Operational Nuclear Power Sys	Volume 5 - 587
236	07	0206313M	Marine Corps Comms Systems	Volume 5 - 589
237	07	0206335M	(U)Common Aviation Command and Control Sys (CAC2S)	Volume 5 - 757
238	07	0206623M	MC Ground Cmbt Spt Arms Sys	Volume 5 - 769
239	07	0206624M	Marine Corps Cmbt Services Supt	Volume 5 - 909
240	07	0206625M	USMC Intelligence/Electronics Warfare Sys	Volume 5 - 971
241	07	0206629M	(U)Amphibious Assault Vehicle	Volume 5 - 1015
242	07	0207161N	Tactical Aim Missiles	Volume 5 - 1027
243	07	0207163N	AMRAAM	Volume 5 - 1039

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
244	07	0219902M	Global Combat Support Systems - Marine Corps	Volume 5 - 1049
248	07	0303109N	Satellite Communications (Space)	Volume 5 - 1055
249	07	0303138N	Consolidated Afloat Network Ent Services(CANES)	Volume 5 - 1079
250	07	0303140N	Information Sys Security Program	Volume 5 - 1089
252	07	0305192N	JT Military Intel Programs	Volume 5 - 1121
253	07	0305204N	Tactical Unmanned Aer Vehicles	Volume 5 - 1125
254	07	0305205N	(U)UAS Integration and Interoperability	Volume 5 - 1135
255	07	0305208M	(U)Distributed Common Ground/Surface Systems	Volume 5 - 1147
256	07	0305208N	Distributed Common Ground Sys	Volume 5 - 1159
257	07	0305220N	(U)MQ-4C Triton	Volume 5 - 1179
258	07	0305231N	MQ-8 UAV	Volume 5 - 1191
259	07	0305232M	RQ-11 UAV	Volume 5 - 1205
260	07	0305234N	(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)	Volume 5 - 1215
261	07	0305239M	(U)RQ-21A	Volume 5 - 1225
262	07	0305241N	(U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT	Volume 5 - 1239
263	07	0305242M	(U)Unmanned Aerial Systems (UAS) Payloads	Volume 5 - 1243
264	07	0305421N	(U)RQ-4 Modernization	Volume 5 - 1273
265	07	0308601N	Modeling & Simulation Support	Volume 5 - 1287

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
266	07	0702207N	Depot Maintenance (NON-IF)	Volume 5 - 1303
267	07	0708730N	Maritime Tech (MARITECH)	Volume 5 - 1325
268	07	1203109N	(U)Satellite Communications (SPACE)	Volume 5 - 1337

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Master Program Element Table of Contents (Alphabetically by Program Element Title)

Program Element Title	Program Element Number	Line #	BA	Page
(U) Innovative Naval Prototypes (INP) Adv Tech Dev	0603801N	30	03	Volume 1 - 383
(U) MC AVS Development & Demonstration	0605611M	173	05	Volume 3 - 1745
(U) Unmanned Carrier Aviation (UCA)	0605414N	168	05	Volume 3 - 1669
(U)AIRCRAFT SYSTEMS	0603251N	33	04	Volume 2 - 119
(U)Advanced Arresting Gear (AAG)	0604530N	138	05	Volume 3 - 825
(U)Advanced Tactical Unmanned Aircraft System	0304240M	100	04	Volume 2 - 1337
(U)Advanced Tactical Unmanned Aircraft System	0304240N	101	04	Volume 2 - 1351
(U)Advanced Undersea Prototyping	0604536N	94	04	Volume 2 - 1209
(U)Air and Missile Defense Radar (AMDR) System	0604522N	137	05	Volume 3 - 811
(U)Amphibious Assault Vehicle	0206629M	241	07	Volume 5 - 1015
(U)Anti-Tamper Technology Support	0605024N	161	05	Volume 3 - 1553
(U)Automated Test and Analysis	0603597N	56	04	Volume 2 - 639
(U)CHALK CORAL	0603734N	66	04	Volume 2 - 867
(U)CHALK EAGLE	0603576N	51	04	Volume 2 - 511
(U)Common Aviation Command and Control Sys (CAC2S)	0206335M	237	07	Volume 5 - 757
(U)Common Avionics	0605217N	165	05	Volume 3 - 1615
(U)Cooperative Engagement Capability	0607658N	213	07	Volume 5 - 37

Program Element Title	Program Element Number	Line #	BA	Page
(U)Cyber Operations Technology Development	0306250M	182	05	Volume 3 - 1819
(U)Deployable Joint Command and Control	0607700N	214	07	Volume 5 - 63
(U)Distributed Common Ground/Surface Systems	0305208M	255	07	Volume 5 - 1147
(U)Executive Helo Development	0604273M	121	05	Volume 3 - 441
(U)Executive Helo Development	0604273N	122	05	Volume 3 - 455
(U)Frigate Development	0603599N	57	04	Volume 2 - 653
(U)Future Naval Capabilities Advanced Tech Dev	0603673N	24	03	Volume 1 - 325
(U)Future Naval Capabilities Applied Research	0602750N	13	02	Volume 1 - 199
(U)Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80	0604112N	84	04	Volume 2 - 1071
(U)Ground/Air Task Oriented Radar (G/ATOR)	0204460M	226	07	Volume 5 - 317
(U)Innovative Naval Prototypes(INP) Applied Res	0602792N	15	02	Volume 1 - 229
(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem	0605813M	174	05	Volume 3 - 1765
(U)Joint Light Tactical Vehicle(JLTV) EMD	0605812M	98	04	Volume 2 - 1317
(U)Joint Strike Fighter (JSF) - EMD	0604800M	155	05	Volume 3 - 1275
(U)Joint Strike Fighter Follow On Mod (FoM) - MC	0604810M	157	05	Volume 3 - 1335
(U)Joint Strike Fighter Follow On Mod (FoM) - Navy	0604810N	158	05	Volume 3 - 1349
(U)Joint Theater Air and Missile Defense Org	0605126N	186	06	Volume 4 - 37
(U)LCS Mission Modules	0603596N	55	04	Volume 2 - 591
(U)LINK EVERGREEN	0603764N	71	04	Volume 2 - 901

Program Element Title	Program Element Number	Line #	BA	Page
(U)LINK PLUMERIA	0603748N	69	04	Volume 2 - 897
(U)LITTORAL COMBAT SHIP	0603581N	52	04	Volume 2 - 513
(U)LX (R)	0604454N	93	04	Volume 2 - 1197
(U)MANAGEMENT HQ - R&D	0605898N	201	06	Volume 4 - 247
(U)MH-XX	0604292N	91	04	Volume 2 - 1177
(U)MQ-4C Triton	0305220N	257	07	Volume 5 - 1179
(U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT	0305241N	262	07	Volume 5 - 1239
(U)Manufacturing Technology Program	0603680N	25	03	Volume 1 - 351
(U)Marine Corps Additive Manufacturing Tech Dev	0604286M	89	04	Volume 2 - 1153
(U)Mission Planning	0605215N	164	05	Volume 3 - 1589
(U)Multi-Mission Maritime (MMA) Increment III	0605504N	172	05	Volume 3 - 1735
(U)Navy Advanced Technology Development(ATD)	0603671N	23	03	Volume 1 - 309
(U)Next Generation Fighter	0605285N	189	06	Volume 4 - 59
(U)Next Generation Jammer (NGJ) Increment II	0604282N	125	05	Volume 3 - 489
(U)Offensive Anti-Surface Warfare Weapon Dev	0604786N	97	04	Volume 2 - 1305
(U)PILOT FISH	0603525N	40	04	Volume 2 - 309
(U)Precision Strike Weapons Development Program	0604659N	95	04	Volume 2 - 1243
(U)RETRACT ELM	0603751N	70	04	Volume 2 - 899
(U)RETRACT JUNIPER	0603536N	42	04	Volume 2 - 313

Program Element Title	Program Element Number	Line #	BA	Page
(U)RETRACT LARCH	0603527N	41	04	Volume 2 - 311
(U)RETRACT MAPLE	0603746N	68	04	Volume 2 - 895
(U)RQ-21A	0305239M	261	07	Volume 5 - 1225
(U)RQ-4 Modernization	0305421N	264	07	Volume 5 - 1273
(U)Remote Minehunting System (RMS)	0604122N	85	04	Volume 2 - 1091
(U)SEW Surveillance/Reconnaissance Support	1206867N	208	06	Volume 4 - 313
(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)	0305234N	260	07	Volume 5 - 1215
(U)SPECIAL PROCESSES	0603787N	72	04	Volume 2 - 903
(U)Satellite Communications (SPACE)	1203109N	268	07	Volume 5 - 1337
(U)Science & Tech Management - ONR Field Acts	0602861N	16	02	Volume 1 - 243
(U)Science & Tech Management - ONR Headquarters	0602898N	17	02	Volume 1 - 249
(U)Ship to Shore Connector (SSC)	0605220N	166	05	Volume 3 - 1649
(U)Special Applications Program	0305124N	181	05	Volume 3 - 1815
(U)T-AO 205 Class	0605327N	167	05	Volume 3 - 1663
(U)UAS Integration and Interoperability	0305205N	254	07	Volume 5 - 1135
(U)Unmanned Aerial Systems (UAS) Payloads	0305242M	263	07	Volume 5 - 1243
(U)Virginia Payload Module (VPM)	0604580N	143	05	Volume 3 - 951
(U)Warfare Innovation Management	0606355N	202	06	Volume 4 - 263
AMRAAM	0207163N	243	07	Volume 5 - 1039

Program Element Title	Program Element Number	Line #	BA	Page
ASW Systems Development	0603254N	34	04	Volume 2 - 127
ASW Systems Development - MIP	0303354N	99	04	Volume 2 - 1327
AV-8B Aircraft - Engine Dev	0604214M	105	05	Volume 3 - 47
AV-8B Aircraft - Engine Dev	0604214N	106	05	Volume 3 - 59
Acoustic Search Sensors	0604261N	116	05	Volume 3 - 297
Advanced Above Water Sensors	0604501N	132	05	Volume 3 - 641
Advanced Combat Systems Tech	0603382N	36	04	Volume 2 - 143
Advanced Hawkeye	0604234N	113	05	Volume 3 - 227
Advanced Nuclear Power Systems	0603570N	49	04	Volume 2 - 491
Advanced Submarine System Development	0603561N	45	04	Volume 2 - 343
Advanced Surface Machinery Sys	0603573N	50	04	Volume 2 - 495
Air Control	0604504N	134	05	Volume 3 - 741
Air Crew Systems Development	0604264N	118	05	Volume 3 - 349
Air/Ocean Equipment Engineering	0604218N	109	05	Volume 3 - 93
Air/Ocean Tactical Applications	0603207N	31	04	Volume 2 - 1
Airborne Mine Countermeasures (AMCM)	0604373N	130	05	Volume 3 - 597
Amphibious Tactical Supt Units	0204413N	225	07	Volume 5 - 303
Assessments and Evaluations Cyber Vulnerabilities	0606942M	203	06	Volume 4 - 289
Assessments and Evaluations Cyber Vulnerabilities	0606942N	204	06	Volume 4 - 293

Program Element Title	Program Element Number	Line #	BA	Page
Aviation Improvements	0205633N	234	07	Volume 5 - 527
Aviation Survivability	0603216N	32	04	Volume 2 - 87
CH-53K	0605212M	162	05	Volume 3 - 1565
CH-53K	0605212N	163	05	Volume 3 - 1577
Cancelled Account Adjustments	0909999N	207	06	Volume 4 - 311
Carrier Systems Development	0603512N	39	04	Volume 2 - 291
Center For Naval Analyses	0605154N	188	06	Volume 4 - 49
Combat Information Center Conv	0604518N	136	05	Volume 3 - 793
Combat System Integration	0603582N	53	04	Volume 2 - 537
Common Picture Applied Research	0602235N	7	02	Volume 1 - 115
Consolidated Afloat Network Ent Services(CANES)	0303138N	249	07	Volume 5 - 1079
Consolidated Trng Sys Dev	0204571N	227	07	Volume 5 - 333
Conventional Munitions	0603609N	58	04	Volume 2 - 667
Cryptologic Direct Support	0204574N	228	07	Volume 5 - 393
DDG-1000	0204202N	175	05	Volume 3 - 1777
Defense Research Sciences	0601153N	3	01	Volume 1 - 15
Depot Maintenance (NON-IF)	0702207N	266	07	Volume 5 - 1303
Digital Warfare	0604027N	79	04	Volume 2 - 1009
Directed Energy and Electric Weapon System	0603925N	77	04	Volume 2 - 967

Program Element Title	Program Element Number	Line #	BA	Page
Distributed Common Ground Sys	0305208N	256	07	Volume 5 - 1159
EA-18 Squadrons	0604269N	119	05	Volume 3 - 361
Elect Warfare Readiness Supt	0204575N	229	07	Volume 5 - 403
Electromagnetic Systems Advanced Technology	0603271N	20	03	Volume 1 - 267
Electromagnetic Systems Applied Research	0602271N	9	02	Volume 1 - 147
Electronic Warfare (EW) Dev	0604270N	120	05	Volume 3 - 377
Electronic Warfare Development - MIP	0304270N	102	04	Volume 2 - 1359
Environmental Protection	0603721N	63	04	Volume 2 - 765
Expeditionary Logistics	0604289M	90	04	Volume 2 - 1161
F-35B C2D2	0604840M	211	07	Volume 5 - 9
F-35C C2D2	0604840N	212	07	Volume 5 - 23
F/A-18 Infrared Search and Track (IRST)	0604014N	78	04	Volume 2 - 997
F/A-18 Squadrons	0204136N	219	07	Volume 5 - 145
Facilities Improvement	0603725N	65	04	Volume 2 - 843
Fleet Tactical Development	0204163N	220	07	Volume 5 - 189
Force Protection Advanced Technology	0603123N	19	03	Volume 1 - 257
Force Protection Applied Res	0602123N	5	02	Volume 1 - 73
Global Combat Support Systems - Marine Corps	0219902M	244	07	Volume 5 - 1049
H-1 Upgrades	0604245M	114	05	Volume 3 - 275

Program Element Title	Program Element Number	Line #	BA	Page
H-1 Upgrades	0604245N	115	05	Volume 3 - 285
Harm Improvement	0205601N	230	07	Volume 5 - 429
Harpoon Modifications	0604227N	210	07	Volume 5 - 1
In-House Lab Independent Res	0601152N	2	01	Volume 1 - 9
Information Sys Security Program	0303140N	250	07	Volume 5 - 1089
Information Technology Development	0605013N	160	05	Volume 3 - 1381
Insider Threat	0305327N	205	06	Volume 4 - 303
Integrated Surveillance System	0204311N	223	07	Volume 5 - 279
Intelligence Engineering	0604761N	152	05	Volume 3 - 1187
JT Military Intel Programs	0305192N	252	07	Volume 5 - 1121
JT Non-Lethal Wpns Applied Res	0602651M	11	02	Volume 1 - 183
JT Non-Lethal Wpns Tech Dev	0603651M	22	03	Volume 1 - 303
JT Precision Approach & Ldg Sys	0603860N	76	04	Volume 2 - 957
JT Service EOD	0604654N	146	05	Volume 3 - 1003
JT Service Explosive Ordn Dev	0603654N	61	04	Volume 2 - 705
JT Strike Fighter (JSF) - EMD	0604800N	156	05	Volume 3 - 1305
JT Tact Radio Sys (JTRS)	0604280N	124	05	Volume 3 - 481
Joint Air-to-ground Missile (JAGM)	0605450M	169	05	Volume 3 - 1693
Joint Air-to-ground Missile (JAGM)	0605450N	170	05	Volume 3 - 1703

Program Element Title	Program Element Number	Line #	BA	Page
Joint Non-Lethal Weapons Testing	0603851M	75	04	Volume 2 - 945
Joint Standoff Weapon Systems	0604727N	148	05	Volume 3 - 1029
LPD-17 Class Systems Integration	0604311N	127	05	Volume 3 - 539
Land Attack Tech	0603795N	74	04	Volume 2 - 913
Large Unmanned Undersea Vehicles	0604031N	83	04	Volume 2 - 1061
Lightweight Torpedo Development	0604610N	145	05	Volume 3 - 975
Littoral Airborne MCM	0604126N	86	04	Volume 2 - 1099
MC Advanced Technology Demo	0603640M	21	03	Volume 1 - 273
MC Ground Cmbt Spt Arms Sys	0206623M	238	07	Volume 5 - 769
MK-48 ADCAP	0205632N	233	07	Volume 5 - 511
MQ-8 UAV	0305231N	258	07	Volume 5 - 1191
Major T&E Investment	0604759N	185	06	Volume 4 - 27
Management Headquarters (Departmental Spt Acts)	0902498N	206	06	Volume 4 - 307
Management, Technical & Intl Supt	0605853N	192	06	Volume 4 - 99
Marine Corps Assault Vehicles	0603611M	59	04	Volume 2 - 681
Marine Corps Cmbt Services Supt	0206624M	239	07	Volume 5 - 909
Marine Corps Comms Systems	0206313M	236	07	Volume 5 - 589
Marine Corps Grnd Cmbt/Supt Sys	0603635M	60	04	Volume 2 - 691
Marine Corps IT Dev/Mod	0605013M	159	05	Volume 3 - 1363

Program Element Title	Program Element Number	Line #	BA	Page
Marine Corps Lndg Force Tech	0602131M	6	02	Volume 1 - 91
Marine Corps Program Wide Supt	0605873M	200	06	Volume 4 - 235
Maritime Tech (MARITECH)	0708730N	267	07	Volume 5 - 1325
Medical Development	0604771N	153	05	Volume 3 - 1191
Mine & Exp Warfare Applied Res	0602782N	14	02	Volume 1 - 221
Mine Development	0604601N	144	05	Volume 3 - 959
Mine and Expeditionary Warfare Advanced Technology	0603782N	29	03	Volume 1 - 377
Modeling & Simulation Support	0308601N	265	07	Volume 5 - 1287
Multi-Mssn Helicopter Upgrade Dev	0604216N	108	05	Volume 3 - 81
Multi-mssn Maritime Aircraft (MMA) (P-8A)	0605500N	171	05	Volume 3 - 1713
NATO Research and Deve	0603790N	73	04	Volume 2 - 905
Nav Integrated Fire Control-Counter Air Sys Eng	0604378N	131	05	Volume 3 - 631
Navigation/Id System	0604777N	154	05	Volume 3 - 1215
Navy Energy Program	0603724N	64	04	Volume 2 - 807
Navy Logistic Productivity	0603739N	67	04	Volume 2 - 869
Navy Space & Electr Warfare Supt	0605866N	198	06	Volume 4 - 221
Navy Strategic Comms	0101402N	218	07	Volume 5 - 117
Navy Tactical Computer Resources	0604574N	142	05	Volume 3 - 939
Navy Warfighting Exp & Demo	0603758N	28	03	Volume 1 - 369

Program Element Title	Program Element Number	Line #	BA	Page
New Design SSN	0604558N	139	05	Volume 3 - 837
Next Generation Jammer (NGJ)	0604274N	123	05	Volume 3 - 467
Ocean Engineering Tech Dev	0603713N	62	04	Volume 2 - 741
Ocean Wrfghtg Env Applied Res	0602435N	10	02	Volume 1 - 167
Operational Nuclear Power Sys	0205675N	235	07	Volume 5 - 587
Operational Test & Eval Capability	0605865N	197	06	Volume 4 - 215
Other Helicopter Development	0604212N	104	05	Volume 3 - 23
P-3 Modernization Program	0604221N	110	05	Volume 3 - 127
Personnel, Trng, Sim, & Human Factors	0604703N	147	05	Volume 3 - 1011
Power Proj Applied Research	0602114N	4	02	Volume 1 - 61
Power Projection Advanced Technology	0603114N	18	03	Volume 1 - 253
RDT&E Science & Tech Mgmt	0605861N	194	06	Volume 4 - 165
RDT&E Ship & Aircraft Support	0605863N	195	06	Volume 4 - 175
RQ-11 UAV	0305232M	259	07	Volume 5 - 1205
Radiological Control	0603542N	43	04	Volume 2 - 315
Rapid Prototyping, Experimentation and Demonstrati	0604030N	82	04	Volume 2 - 1053
Rapid Technology Capability Prototype	0604320M	92	04	Volume 2 - 1183
SEW Architecture/Eng Support	0604707N	96	04	Volume 2 - 1265
SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS	0204313N	224	07	Volume 5 - 295

Program Element Title	Program Element Number	Line #	BA	Page
SSBN New Design	0603595N	54	04	Volume 2 - 575
SSBN Security Tech Program	0101224N	216	07	Volume 5 - 103
SSN-688 & Trident Modernization	0604503N	133	05	Volume 3 - 677
Satellite Communications (Space)	0303109N	248	07	Volume 5 - 1055
Ship Concept Advanced Design	0603563N	47	04	Volume 2 - 427
Ship Contract Design/ Live Fire T&E	0604567N	141	05	Volume 3 - 885
Ship Prel Design & Feasibility Studies	0603564N	48	04	Volume 2 - 469
Ship Self Def (Detect & Cntrl)	0604755N	149	05	Volume 3 - 1037
Ship Self Def (Engage: Hard Kill)	0604756N	150	05	Volume 3 - 1089
Ship Self Def (Engage: Soft Kill/EW)	0604757N	151	05	Volume 3 - 1133
Shipboard Aviation Systems	0604512N	135	05	Volume 3 - 775
Small Business Innovative Research	0605502N	190	06	Volume 4 - 63
Small Diameter Bomb (SDB)	0604329N	128	05	Volume 3 - 547
Small and Medium Unmanned Undersea Vehicles	0604028N	80	04	Volume 2 - 1023
Space & Elec War Surv/Recon	0605867N	199	06	Volume 4 - 229
Standard Missile Improvements	0604366N	129	05	Volume 3 - 571
Standards Development	0604215N	107	05	Volume 3 - 71
Strategic Sub & Wpns Sys Supt	0101221N	215	07	Volume 5 - 71
Strategic Technical Support	0605856N	193	06	Volume 4 - 157

Program Element Title	Program Element Number	Line #	BA	Page
Studies & Analysis Supt - Navy	0605152N	187	06	Volume 4 - 41
Submarine Acoustic War Dev	0101226N	217	07	Volume 5 - 105
Submarine Tactical Warfare Sys	0603562N	46	04	Volume 2 - 405
Submarine Tactical Warfare System	0604562N	140	05	Volume 3 - 863
Surface & Shallow Water MCM	0603502N	37	04	Volume 2 - 197
Surface ASW	0603553N	44	04	Volume 2 - 333
Surface ASW Cmbt Sys Integr	0205620N	232	07	Volume 5 - 497
Surface Combatant Cmbt Sys Eng	0604307N	126	05	Volume 3 - 501
Surface Mine Countermeasures	0604127N	87	04	Volume 2 - 1111
Surface Ship Torpedo Defense	0603506N	38	04	Volume 2 - 281
Surface Support	0204228N	221	07	Volume 5 - 209
Tact Air Dir Infrared CM (TADIRCM)	0604272N	88	04	Volume 2 - 1131
Tactical Aim Missiles	0207161N	242	07	Volume 5 - 1027
Tactical Airborne Reconnaissance	0603261N	35	04	Volume 2 - 135
Tactical Command System	0604231N	112	05	Volume 3 - 161
Tactical Command System - MIP	0304231N	179	05	Volume 3 - 1787
Tactical Cryptologic Systems	0304785N	180	05	Volume 3 - 1793
Tactical Data Links	0205604N	231	07	Volume 5 - 457
Tactical Unmanned Aer Vehicles	0305204N	253	07	Volume 5 - 1125

Program Element Title	Program Element Number	Line #	BA	Page
Target Systems Development	0604258N	184	06	Volume 4 - 15
Technical Information Services	0605804N	191	06	Volume 4 - 93
Test & Evaluation Support	0605864N	196	06	Volume 4 - 187
Threat Simulator Development	0604256N	183	06	Volume 4 - 1
Tomahawk Mssn Planning Ctr	0204229N	222	07	Volume 5 - 223
Training System Aircraft	0603208N	103	05	Volume 3 - 1
USMC Intelligence/Electronics Warfare Sys	0206625M	240	07	Volume 5 - 971
Undersea Warfare Advanced Tech	0603747N	27	03	Volume 1 - 365
Undersea Warfare Applied Res	0602747N	12	02	Volume 1 - 187
University Research Initiatives	0601103N	1	01	Volume 1 - 1
Unmanned Undersea Vehicle Core Technologies	0604029N	81	04	Volume 2 - 1033
V-22A	0604262N	117	05	Volume 3 - 315
Warfare Support System	0604230N	111	05	Volume 3 - 133
Warfighter Protection Adv Tech	0603729N	26	03	Volume 1 - 359
Warfighter Sustainment Applied Res	0602236N	8	02	Volume 1 - 129

Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
103	05	0603208N	Training System Aircraft	Volume 3 - 1
104	05	0604212N	Other Helicopter Development	Volume 3 - 23
105	05	0604214M	AV-8B Aircraft - Engine Dev	Volume 3 - 47
106	05	0604214N	AV-8B Aircraft - Engine Dev	Volume 3 - 59
107	05	0604215N	Standards Development	Volume 3 - 71
108	05	0604216N	Multi-Mssn Helicopter Upgrade Dev	Volume 3 - 81
109	05	0604218N	Air/Ocean Equipment Engineering	Volume 3 - 93
110	05	0604221N	P-3 Modernization Program	Volume 3 - 127
111	05	0604230N	Warfare Support System	Volume 3 - 133
112	05	0604231N	Tactical Command System	Volume 3 - 161
113	05	0604234N	Advanced Hawkeye	Volume 3 - 227
114	05	0604245M	H-1 Upgrades	Volume 3 - 275
115	05	0604245N	H-1 Upgrades	Volume 3 - 285
116	05	0604261N	Acoustic Search Sensors	Volume 3 - 297
117	05	0604262N	V-22A	Volume 3 - 315
118	05	0604264N	Air Crew Systems Development	Volume 3 - 349

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
119	05	0604269N	EA-18 Squadrons	Volume 3 - 361
120	05	0604270N	Electronic Warfare (EW) Dev	Volume 3 - 377
121	05	0604273M	(U)Executive Helo Development	Volume 3 - 441
122	05	0604273N	(U)Executive Helo Development	Volume 3 - 455
123	05	0604274N	Next Generation Jammer (NGJ)	Volume 3 - 467
124	05	0604280N	JT Tact Radio Sys (JTRS)	Volume 3 - 481
125	05	0604282N	(U)Next Generation Jammer (NGJ) Increment II	Volume 3 - 489
126	05	0604307N	Surface Combatant Cmbt Sys Eng	Volume 3 - 501
127	05	0604311N	LPD-17 Class Systems Integration	Volume 3 - 539
128	05	0604329N	Small Diameter Bomb (SDB)	Volume 3 - 547
129	05	0604366N	Standard Missile Improvements	Volume 3 - 571
130	05	0604373N	Airborne Mine Countermeasures (AMCM)	Volume 3 - 597
131	05	0604378N	Nav Integrated Fire Control-Counter Air Sys Eng	Volume 3 - 631
132	05	0604501N	Advanced Above Water Sensors	Volume 3 - 641
133	05	0604503N	SSN-688 & Trident Modernization	Volume 3 - 677
134	05	0604504N	Air Control	Volume 3 - 741
135	05	0604512N	Shipboard Aviation Systems	Volume 3 - 775
136	05	0604518N	Combat Information Center Conv	Volume 3 - 793

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
137	05	0604522N	(U)Air and Missile Defense Radar (AMDR) System	Volume 3 - 811
138	05	0604530N	(U)Advanced Arresting Gear (AAG)	Volume 3 - 825
139	05	0604558N	New Design SSN	Volume 3 - 837
140	05	0604562N	Submarine Tactical Warfare System	Volume 3 - 863
141	05	0604567N	Ship Contract Design/ Live Fire T&E	Volume 3 - 885
142	05	0604574N	Navy Tactical Computer Resources	Volume 3 - 939
143	05	0604580N	(U)Virginia Payload Module (VPM)	Volume 3 - 951
144	05	0604601N	Mine Development	Volume 3 - 959
145	05	0604610N	Lightweight Torpedo Development	Volume 3 - 975
146	05	0604654N	JT Service EOD	Volume 3 - 1003
147	05	0604703N	Personnel, Trng, Sim, & Human Factors	Volume 3 - 1011
148	05	0604727N	Joint Standoff Weapon Systems	Volume 3 - 1029
149	05	0604755N	Ship Self Def (Detect & Cntrl)	Volume 3 - 1037
150	05	0604756N	Ship Self Def (Engage: Hard Kill)	Volume 3 - 1089
151	05	0604757N	Ship Self Def (Engage: Soft Kill/EW)	Volume 3 - 1133
152	05	0604761N	Intelligence Engineering	Volume 3 - 1187
153	05	0604771N	Medical Development	Volume 3 - 1191
154	05	0604777N	Navigation/Id System	Volume 3 - 1215

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
155	05	0604800M	(U)Joint Strike Fighter (JSF) - EMD	Volume 3 - 1275
156	05	0604800N	JT Strike Fighter (JSF) - EMD	Volume 3 - 1305
157	05	0604810M	(U)Joint Strike Fighter Follow On Mod (FoM) - MC	Volume 3 - 1335
158	05	0604810N	(U)Joint Strike Fighter Follow On Mod (FoM) - Navy	Volume 3 - 1349
159	05	0605013M	Marine Corps IT Dev/Mod	Volume 3 - 1363
160	05	0605013N	Information Technology Development	Volume 3 - 1381
161	05	0605024N	(U)Anti-Tamper Technology Support	Volume 3 - 1553
162	05	0605212M	CH-53K	Volume 3 - 1565
163	05	0605212N	CH-53K	Volume 3 - 1577
164	05	0605215N	(U)Mission Planning	Volume 3 - 1589
165	05	0605217N	(U)Common Avionics	Volume 3 - 1615
166	05	0605220N	(U)Ship to Shore Connector (SSC)	Volume 3 - 1649
167	05	0605327N	(U)T-AO 205 Class	Volume 3 - 1663
168	05	0605414N	(U) Unmanned Carrier Aviation (UCA)	Volume 3 - 1669
169	05	0605450M	Joint Air-to-ground Missile (JAGM)	Volume 3 - 1693
170	05	0605450N	Joint Air-to-ground Missile (JAGM)	Volume 3 - 1703
171	05	0605500N	Multi-mssn Maritime Aircraft (MMA) (P-8A)	Volume 3 - 1713
172	05	0605504N	(U)Multi-Mission Maritime (MMA) Increment III	Volume 3 - 1735

Appropriation 1319: Research, Development, Test & Evaluation, Navy

Line #	Budget Activity	Program Element Number	Program Element Title	Page
173	05	0605611M	(U) MC AVS Development & Demonstration	Volume 3 - 1745
174	05	0605813M	(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem	Volume 3 - 1765
175	05	0204202N	DDG-1000	Volume 3 - 1777
179	05	0304231N	Tactical Command System - MIP	Volume 3 - 1787
180	05	0304785N	Tactical Cryptologic Systems	Volume 3 - 1793
181	05	0305124N	(U)Special Applications Program	Volume 3 - 1815
182	05	0306250M	(U)Cyber Operations Technology Development	Volume 3 - 1819

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Program Element Table of Contents (Alphabetically by Program Element Title)

Program Element Title	Program Element Number	Line #	BA	Page
(U) MC AVS Development & Demonstration	0605611M	173	05	Volume 3 - 1745
(U) Unmanned Carrier Aviation (UCA)	0605414N	168	05	Volume 3 - 1669
(U)Advanced Arresting Gear (AAG)	0604530N	138	05	Volume 3 - 825
(U)Air and Missile Defense Radar (AMDR) System	0604522N	137	05	Volume 3 - 811
(U)Anti-Tamper Technology Support	0605024N	161	05	Volume 3 - 1553
(U)Common Avionics	0605217N	165	05	Volume 3 - 1615
(U)Cyber Operations Technology Development	0306250M	182	05	Volume 3 - 1819
(U)Executive Helo Development	0604273M	121	05	Volume 3 - 441
(U)Executive Helo Development	0604273N	122	05	Volume 3 - 455
(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem	0605813M	174	05	Volume 3 - 1765
(U)Joint Strike Fighter (JSF) - EMD	0604800M	155	05	Volume 3 - 1275
(U)Joint Strike Fighter Follow On Mod (FoM) - MC	0604810M	157	05	Volume 3 - 1335
(U)Joint Strike Fighter Follow On Mod (FoM) - Navy	0604810N	158	05	Volume 3 - 1349
(U)Mission Planning	0605215N	164	05	Volume 3 - 1589
(U)Multi-Mission Maritime (MMA) Increment III	0605504N	172	05	Volume 3 - 1735
(U)Next Generation Jammer (NGJ) Increment II	0604282N	125	05	Volume 3 - 489
(U)Ship to Shore Connector (SSC)	0605220N	166	05	Volume 3 - 1649

Program Element Title	Program Element Number	Line #	BA	Page
(U)Special Applications Program	0305124N	181	05	Volume 3 - 1815
(U)T-AO 205 Class	0605327N	167	05	Volume 3 - 1663
(U)Virginia Payload Module (VPM)	0604580N	143	05	Volume 3 - 951
AV-8B Aircraft - Engine Dev	0604214M	105	05	Volume 3 - 47
AV-8B Aircraft - Engine Dev	0604214N	106	05	Volume 3 - 59
Acoustic Search Sensors	0604261N	116	05	Volume 3 - 297
Advanced Above Water Sensors	0604501N	132	05	Volume 3 - 641
Advanced Hawkeye	0604234N	113	05	Volume 3 - 227
Air Control	0604504N	134	05	Volume 3 - 741
Air Crew Systems Development	0604264N	118	05	Volume 3 - 349
Air/Ocean Equipment Engineering	0604218N	109	05	Volume 3 - 93
Airborne Mine Countermeasures (AMCM)	0604373N	130	05	Volume 3 - 597
CH-53K	0605212M	162	05	Volume 3 - 1565
CH-53K	0605212N	163	05	Volume 3 - 1577
Combat Information Center Conv	0604518N	136	05	Volume 3 - 793
DDG-1000	0204202N	175	05	Volume 3 - 1777
EA-18 Squadrons	0604269N	119	05	Volume 3 - 361
Electronic Warfare (EW) Dev	0604270N	120	05	Volume 3 - 377
H-1 Upgrades	0604245M	114	05	Volume 3 - 275

Program Element Title	Program Element Number	Line #	BA	Page
H-1 Upgrades	0604245N	115	05	Volume 3 - 285
Information Technology Development	0605013N	160	05	Volume 3 - 1381
Intelligence Engineering	0604761N	152	05	Volume 3 - 1187
JT Service EOD	0604654N	146	05	Volume 3 - 1003
JT Strike Fighter (JSF) - EMD	0604800N	156	05	Volume 3 - 1305
JT Tact Radio Sys (JTRS)	0604280N	124	05	Volume 3 - 481
Joint Air-to-ground Missile (JAGM)	0605450M	169	05	Volume 3 - 1693
Joint Air-to-ground Missile (JAGM)	0605450N	170	05	Volume 3 - 1703
Joint Standoff Weapon Systems	0604727N	148	05	Volume 3 - 1029
LPD-17 Class Systems Integration	0604311N	127	05	Volume 3 - 539
Lightweight Torpedo Development	0604610N	145	05	Volume 3 - 975
Marine Corps IT Dev/Mod	0605013M	159	05	Volume 3 - 1363
Medical Development	0604771N	153	05	Volume 3 - 1191
Mine Development	0604601N	144	05	Volume 3 - 959
Multi-Mssn Helicopter Upgrade Dev	0604216N	108	05	Volume 3 - 81
Multi-mssn Maritime Aircraft (MMA) (P-8A)	0605500N	171	05	Volume 3 - 1713
Nav Integrated Fire Control-Counter Air Sys Eng	0604378N	131	05	Volume 3 - 631
Navigation/Id System	0604777N	154	05	Volume 3 - 1215
Navy Tactical Computer Resources	0604574N	142	05	Volume 3 - 939

Program Element Title	Program Element Number	Line #	BA	Page
New Design SSN	0604558N	139	05	Volume 3 - 837
Next Generation Jammer (NGJ)	0604274N	123	05	Volume 3 - 467
Other Helicopter Development	0604212N	104	05	Volume 3 - 23
P-3 Modernization Program	0604221N	110	05	Volume 3 - 127
Personnel, Trng, Sim, & Human Factors	0604703N	147	05	Volume 3 - 1011
SSN-688 & Trident Modernization	0604503N	133	05	Volume 3 - 677
Ship Contract Design/ Live Fire T&E	0604567N	141	05	Volume 3 - 885
Ship Self Def (Detect & Cntrl)	0604755N	149	05	Volume 3 - 1037
Ship Self Def (Engage: Hard Kill)	0604756N	150	05	Volume 3 - 1089
Ship Self Def (Engage: Soft Kill/EW)	0604757N	151	05	Volume 3 - 1133
Shipboard Aviation Systems	0604512N	135	05	Volume 3 - 775
Small Diameter Bomb (SDB)	0604329N	128	05	Volume 3 - 547
Standard Missile Improvements	0604366N	129	05	Volume 3 - 571
Standards Development	0604215N	107	05	Volume 3 - 71
Submarine Tactical Warfare System	0604562N	140	05	Volume 3 - 863
Surface Combatant Cmbt Sys Eng	0604307N	126	05	Volume 3 - 501
Tactical Command System	0604231N	112	05	Volume 3 - 161
Tactical Command System - MIP	0304231N	179	05	Volume 3 - 1787
Tactical Cryptologic Systems	0304785N	180	05	Volume 3 - 1793

Program Element Title	Program Element Number	Line #	BA	Page
Training System Aircraft	0603208N	103	05	Volume 3 - 1
V-22A	0604262N	117	05	Volume 3 - 315
Warfare Support System	0604230N	111	05	Volume 3 - 133

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0603208N *I Training System Aircraft*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	29.553	17.490	16.945	12.798	-	12.798	15.722	4.184	3.429	3.487	0.000	103.608
3367: *Training Aircraft Updates*	29.553	17.490	16.945	12.798	-	12.798	15.722	4.184	3.429	3.487	0.000	103.608

A. Mission Description and Budget Item Justification

This program element provides for design, development, integration and test of various pre-production platform improvements for Naval Undergraduate Flight Training Systems which include T-45, T-6, TH-57, and T-44 aircraft. Continued development engineering for improvements in reliability, maintainability, safety and meeting Federal Aviation Administration (FAA) Next Generation Air Transportation System (NextGen) flight safety requirements are required to ensure maximum benefit is achieved to provide effective cost of ownership and availability of aircraft to meet Chief of Naval Air Training (CNATRA) student training requirements. Specific efforts include: T-45 Training System (TS) Required Avionics Sustainment Program (RASP) Phase I Automatic Dependent Surveillance-Broadcast (ADS-B) Out; T-6 Joint Primary Aircraft Training System (JPATS) Communication and Navigation System/Air Traffic Management (CNS/ATM); TH-57 Follow-On Training System; T-45, T-6, TH-57 and T-44 Training System Improvements, T-6 Flight Management System and T-45 Physiological Episode (PE) mitigation analysis.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

The FY 2019 funding request was reduced by $2.016 million to account for the availability of prior year execution balances.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	19.938	16.945	6.593	-	6.593
Current President's Budget	17.490	16.945	12.798	-	12.798
Total Adjustments	-2.448	0.000	6.205	-	6.205
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.448	0.000			
• Program Adjustments	0.000	0.000	6.297	-	6.297
• Rate/Misc Adjustments	0.000	0.000	-0.092	-	-0.092
• Congressional Directed Reductions Adjustments	-2.000	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0603208N *I Training System Aircraft*

Change Summary Explanation

FY 2019 adjustments include funding for Naval Aviation Physiological Episode Mitigation and Aviation Technical Corrections.

Technical: T45 Required Avionics Sustainment program (RASP)the FY 2019 funding request was reduced $2.016 million to account for the availability of prior year execution balances.

Schedule: Training System Improvement schedule updated T-6 System Safety Improvements to the Joint Primary Aircraft Training System (T-6) for Crash Survivable Cockpit Voice Recorder (CSCVR) and Controlled Flight Into Terrain (CFIT) Avoidance which will extend the program to FY 2020. Training System Improvement System Development schedule updated to extend through FY 2023.

Schedule: T-6B Flight Management System schedule to include a System Development Design Review and Hardware development. Initially this was a joint program with the United States Air Force, due to reprioritization this is now a United States Navy only program. Causing this to be a New Start in FY 2019.

Schedule: T-45 Physiological Episode Mitigation T-45 Acceptance Test in FY 2019.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0603208N / *Training System Aircraft*				Project (Number/Name) 3367 / *Training Aircraft Updates*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3367: *Training Aircraft Updates*	29.553	17.490	16.945	12.798	-	12.798	15.722	4.184	3.429	3.487	0.000	103.608
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The Federal Aviation Administration (FAA) has developed a plan to modernize the National Airspace System (NAS) in order to address the impact of air traffic growth in the United States. This multi-phase plan, called Next Generation Air Transportation System (NextGen) is intended to increase the air traffic capacity while at the same time improving safety and efficiency. In part, NextGen implements a capability called Performance Based Navigation (PBN) in which the aircraft's navigation performance capability will be a determining factor as to whether or not it can fly within specific airspace, certain air traffic routes or instrumental procedures. Also, NextGen transforms the NAS from a radar based system, with aircraft interrogation, to a satellite based system utilizing Automatic Dependent Surveillance-Broadcast (ADS-B) Out communication in order to transmit the aircraft's own position to the controllers and other ADS-B IN capable aircraft. PBN is an enabler for ADS-B functionality.

On May 28th, 2010 the FAA released DoT/FAA, 14 CFR Part 91: Automatic Dependent Surveillance-Broadcast (ADS-B) Out Performance Requirements to Support Air Traffic Control (ATC) Service Final Rule. This mandate stipulated that all aircraft required to have unrestricted access to operate in Classes A, B and C airspace; certain Class E airspace, and other specified airspace requiring ADS-B Out, must be in compliance with this regulation by January 1, 2020.

A. Mission Description and Budget Item Justification

The T-45 Training System (TS) Required Avionics Sustainment Program (RASP) Phase I ADS-B Out:

In order for the T-45TS to continue to have unrestricted access to the NAS through its projected end of service life, 2035, and avoid impacts to Chief of Naval Air Training (CNATRA) Strike Pilot and Naval Flight Officer (NFO) training, the T-45TS must develop, test and integrate the RASP Phase I ADS-B Out capability. This research and development effort consists of the minimum required capability increase necessary to enable ADS-B Out in the T-45, equipping 197 aircraft and 18 simulators to meet the January 1, 2020 FAA ADS-B Out mandate. Specifically, this includes the development, integration, test and certification of the replacement for the APX-100 Transponder (with associated control panel, personality module, compliant navigation source and data bus connectivity), the replacement of the Air Data Computer (ADC), and the integration of these components with the existing aircraft antennas and Mission Display Processor (MDP) Operational Flight Program (OFP) software.

The T-6 Joint Primary Aircraft Training System (JPATS) Communication and Navigation System/Air Traffic Management (CNS/ATM):

JPATS is a joint United States Navy (USN)/United States Air Force (USAF) Acquisition Program designed to replace the aging primary aircraft (T-34/T-37) fleet. Principle JPATS mission is primary training for entry-level Navy/Air Force student pilots, associated instructor pilots, and primary/intermediate training for USN Naval Flight Officers (NFO). JPATS includes the T-6 Texan II, which is a stepped tandem seat, commercially derived aircraft powered by a single Pratt & Whitney PT6A-68 turboprop engine. It serves as the aircraft component of the JPATS integrated primary pilot training system. In order for the T-6 A&B training aircraft to continue to have unrestricted access to the national air space through its projected end of service life and avoid impacts to CNATRA primary entry-level student pilots and NFO

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

training, the T-6 program must develop, integrate, test and certify ADS-B Out capability for both the A&B models. This effort will consist of the minimum required capability increase necessary for ADS-B Out, enabling 295 aircraft and 34 simulators to meet the January 1, 2020 FAA mandate. This effort includes, but is not limited to, development, integration, test and certification.

The TH-57 Follow-On Training System:

The TH-57 Training System consists of TH-57B aircraft, TH-57C aircraft, and associated family of ground based training devices. The TH-57 Training System is experiencing obsolescence, diminishing manufacturing sources and material shortages, training capability gaps (as identified in the Capabilities based assessment Naval Aviation Undergraduate Flight Training), and increasingly expensive operating costs related to aging aircraft issues. This research and development effort will investigate alternatives for replacing the TH-57 training system and develop and validate the acquisition strategy for future procurement of the capability to continue to provide the fleet replacement squadrons with qualified and capable rotary-wing naval aviators to train on fleet platforms. This effort includes, but is not limited to, market research, requirements development, evaluation of acquisition strategies, evaluation of proposals, and testing of prototypes which are technically mature and ready for evaluation in the Engineering and Manufacturing Development phase.

Training System Improvements:

Efforts will provide for studies and analysis, design, development, integration and test of pre-production platform improvements for Naval Undergraduate Flight Training Systems, which will conduct engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decisions.

Flight Management System:

Efforts will provide for studies, design review and development for platform improvements for Naval Undergraduate Flight Training Systems for Flight Management System.

T-45 Physiological Episode (PE) Mitigation:

Efforts will provide for studies and development efforts to address mitigation of the T-45 physiological episodes.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: T45 Required Avionics Sustainment Program (RASP)	11.996	16.109	4.366	0.000	4.366
Articles:	-	-	-	-	-
Description: Funding supports development, integration, test, and certification of the Automatic Dependent Surveillance-Broadcast (ADS-B) Out capability in the T-45 Training System to comply with the January 1, 2020 Federal Aviation Administration ADS-B Out mandate.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continue the ADS-B Out design and integration efforts to support Critical Design Review (CDR) planned for 1Q FY 2018 and Test Readiness Review (TRR) in mid FY 2018 followed by laboratory integration testing. ***FY 2019 Base Plans:*** Flight Readiness Review (FRR) is planned to complete in Q1 FY 2019 followed by the commencement of on-aircraft developmental test in support of certification in Q4 FY 2019. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was reduced due to architectural decisions to upgrade or repurpose components at reduced costs.					
Title: T6 A/B Communication and Navigation System/Air Traffic Management (CNS/ATM)	2.990	0.556	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Funding supports development, integration, test, and certification of the Automatic Dependent Surveillance-Broadcast (ADS-B) Out capability in the T-6 A/B Training System to comply with the January 1, 2020 Federal Aviation Administration ADS-B Out mandate. ***FY 2018 Plans:*** Continue USAF led T-6A development efforts with completion of test and evaluation and transition to procurement. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2018 to FY 2019 decrease is due to program no longer needing research and development in FY 2019. Program is currently being installed on aircraft.					
Title: TH-57 Follow-On Training System	1.552	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: The TH-57 Training System consists of TH-57B aircraft, TH-57C aircraft, and associated family of ground based training devices. The TH-57 Training System is experiencing obsolescence, diminishing manufacturing sources and material shortages, training capability gaps (as identified in the Capabilities Based Assessment Naval Aviation Undergraduate Flight Training), and increasingly expensive operating costs related to aging aircraft issues. This research and development effort will investigate alternatives for replacing the TH-57 training system and develop and validate the acquisition strategy for future procurement of the capability to continue to provide the fleet replacement squadrons with qualified and capable rotary-wing Naval Aviators. This effort includes, but is not limited to, market research, requirements development, evaluation of acquisition strategies, evaluation of proposals, and testing of prototypes. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A					
Title: Training System Improvements	0.952	0.280	0.101	0.000	0.101
Articles:	-	-	-	-	-
Description: Funding provides for design, development, integration and test of platform improvements for Naval Undergraduate Flight Training Systems, which include T-45, T-6, TH-57 and T-44 aircraft. ***FY 2018 Plans:*** Continue studies & development efforts for platform improvements for Naval Undergraduate Flight Training Systems, including but not limited to T-45 Physiological Episode mitigation, and joint efforts with Air Force for Joint Primary Aircraft Training System (T-6). ***FY 2019 Base Plans:*** Continue studies & development efforts for platform improvements for Naval Undergraduate Flight Training Systems, including the system safety improvements to the Joint Primary Aircraft Training System (T-6) for Crash Survivable Cockpit Voice Recorder (CSCVR) and Controlled Flight Into Terrain (CFIT) Avoidance. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 2018 to FY 2019 is to due to decrease in development efforts under training system improvement but increase in other development platform improvements					
Title: Naval Aviation Physiological Episode ***Articles:*** ***Description:*** Funding provides for design, development, integration and test of platform improvements for Naval Undergraduate Flight Training Systems to include Naval Aviation Physiological Episode (PE) Mitigation in the Training Aircrafts (T-45 and T-6). ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Continue studies & development efforts for platform improvements for Naval Undergraduate Flight Training Systems, including T-45 Physiological Episode mitigation, and joint efforts with Air Force for Joint Primary Aircraft Training System (T-6). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY 2018 to FY 2019 is due to platform improvements to the T-45 for Physiological Episode mitigation.	0.000 -	0.000 -	6.100 -	0.000 -	6.100 -
Title: Flight Management System (FMS) ***Articles:*** ***Description:*** Funding provides for design, development, integration and test of platform improvements for Naval Undergraduate Flight Training Systems to the Joint Primary Aircraft Training System (T-6). ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:***	0.000 -	0.000 -	2.231 -	0.000 -	2.231 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Studies & development efforts for platform improvements for Naval Undergraduate Flight Training Systems, including Flight Management System and joint efforts with Air Force for Joint Primary Aircraft Training System (T-6). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2018 to FY 2019 increase is due to the New Start of the Flight Management System development effort.					
Accomplishments/Planned Programs Subtotals	17.490	16.945	12.798	0.000	12.798

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0569: *T45 Series*	105.150	148.071	195.475	-	195.475	206.447	166.832	171.469	180.619	664.839	2,622.101
• APN/0571: *JT Primary Acft Trnr Sys (JPATS)*	10.732	27.007	27.644	-	27.644	22.181	30.018	30.787	31.407	40.440	263.872
• APN/0549: *Trainer Acft Series*	11.271	8.184	11.660	-	11.660	5.330	25.809	26.321	26.825	0.000	337.931

Remarks

D. Acquisition Strategy

T-45 Training System: Required Avionics Sustainment Program (RASP) Phase I is the first phase to equip the T-45 to operate in the Federal Aviation Administration's (FAA) Next Generation Air Transportation System (NextGen) airspace through the expected life of the T-45. The Research Development Test and Evaluation effort consists of a sole source Technology Maturation and Risk Reduction/ Engineering Manufacturing Development contract effort that awarded in FY 2016. Replacement kits for the Weapon Replaceable Assemblies (WRA) associated with the Automatic Dependent Surveillance-Broadcast (ADS-B) Out capability will be contracted through the Lead Systems Integrator for the Engineering Manufacturing Development phase through Test and Validation/Verification.

T6 Communication, Navigation, System/Air Traffic Management (CNS/ATM) and Avionics Upgrades for FAA Compliance are outside of the Joint Primary Aircraft Training System (JPATS) Major Defense Acquisition Program (MDAP) and will be established as a new Joint Acquisition Program with the United States Air Force. For the JPATS Avionics Upgrade for FAA Compliance effort, a competitive award will be the strategy for the T-6A air vehicles due to their federated design. The Navy is the lead for T-6B acquisition efforts and a sole-source strategy will be sought for the T-6B air vehicles due to proprietary hardware and software. Avionics in the T-6B are of an integrated design with proprietary hardware and software controlling input and output of navigation, communications, air data and other avionics information through an Integrated Avionics Computer (IAC). The CNS/ATM mandate requires integration into these systems in order to meet FAA Advisory Circular 20-165A Automatic Dependent Surveillance-Broadcast (ADS-B) Out system requirements and user capability requirements for flying in national airspace by 2020.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

Specifically, transponder and Global Positioning System (GPS) information that the ADS-B functions rely on are processed through proprietary software written to integrate with proprietary hardware designed by the same avionics manufacturer. A sole-source approach has been selected because the government does not own or have access to proprietary data to support development of hardware or software required to integrate ADS-B into the aircraft. Flight Management System and System Safety Improvement research, design and development will allow the T-6 to remain a viable aircraft for training the Fleet.

The TH-57 Follow-On Training System effort will be established to determine and implement the most cost efficient and effective path forward for providing Rotary Wing Naval Aviators to the Fleet Replacement Squadrons. Possible acquisition paths include direct procurement of a new commercial off-the-shelf training system, some combination of procurement and services contract, or a services contract to provide aircraft, simulators, and ground instructors. This effort follows up the Office of the Chief of Naval Operations (OPNAV) N98 sponsored Capabilities Based Assessment Naval Aviation Undergraduate Flight Training Capabilities Based Assessment and follow on Initial Capabilities Document that is in work.

Training System Improvements: Efforts under this category are expected to be limited to those efforts meeting thresholds under the abbreviated acquisition category.

E. Performance Metrics

T-45 Training System: Performance of the program will be measured via the Acquisition and Systems Engineering Technical Review (SETR) Process. Critical Design Review (CDR) is planned for 1st quarter FY 2018 with Flight Readiness Review (FRR) planned for 1st quarter FY 2019.

T-6 Joint Primary Aircraft Training System (JPATS): For T-6B National Airspace Compliance is an Abbreviated Acquisition Program with Acquisition Milestones utilizing systems engineering processes. Flight management system and other system safety improvements will allow the T-6 to maintain Joint requirements.

TH-57 Follow-On Training System: The follow-on system to the TH-57 will be a new Major Defense Acquisition Program (MDAP) with Acquisition Milestones utilizing the systems engineering processes. If the procurement is determined to be services based, it will be a Category I services Acquisition.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0603208N / *Training System Aircraft*	Project (Number/Name) 3367 / *Training Aircraft Updates*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T45 Product Development Cost	SS/CPFF	Boeing : St. Louis, MO	12.158	4.004	Sep 2017	9.439	Mar 2018	4.720	Mar 2019	-		4.720	4.300	34.621	34.621
T6 Product Development Cost	C/CPFF	Textron Aircraft Defense : Wichita, KS	3.870	0.065	Nov 2016	0.000		2.231	Jan 2019	-		2.231	6.900	13.066	13.066
		Subtotal	16.028	4.069		9.439		6.951		-		6.951	11.200	47.687	N/A

Remarks

T45: FY 2019 Development Costs support efforts for box and integration development, lab testing, aircraft test and certification prep.
T6: FY 2019 Development Costs support efforts for design and hardware development for Flight Management System and System Improvements.
T6: FY 2019 Development Costs support efforts for Critical Design Review (CDR), box and integration development, lab testing, aircraft test and certification prep.
T45: FY 2019 Development Costs support efforts for validation and verification of the final design.
T6: FY 2018 Development Costs support United States Air Force led efforts for T-6A aircraft.
T6: FY 2019 Increased for Aviation Technical Corrections funding didn't exist for this effort in FY2018.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T45 Systems Engineering Support - EMD	WR	NAWCAD : Patuxent River, MD	4.696	1.324	Nov 2016	1.562	Nov 2017	1.200	Nov 2018	-		1.200	2.710	11.492	-
T45 Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	1.248	0.907	Nov 2016	1.072	Nov 2017	1.107	Nov 2018	-		1.107	2.020	6.354	-
T45 Engineering Study	SS/BOA	JHU : Laurel, MD	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	0.300
T6 Systems Engineering Support	WR	NAWCAD : Patuxent River, MD	1.670	0.244	Dec 2016	0.526	Mar 2018	0.000		-		0.000	0.000	2.440	-
T6 Systems Engineering Support	WR	NADEP : Jacksonville, FL	0.101	0.117	Dec 2016	0.250	Jan 2018	0.000		-		0.000	0.000	0.468	-
T6 Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	1.055	0.217	Dec 2016	0.000		0.000		-		0.000	0.000	1.272	-
TH57 Systems Engineering Support	WR	NAWCAD : Patuxent River, MD	0.000	0.603	Oct 2016	0.000		0.000		-		0.000	0.000	0.603	-
TH57 Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.000	0.252	Oct 2016	0.000		0.000		-		0.000	0.000	0.252	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0603208N / *Training System Aircraft*	Project (Number/Name) 3367 / *Training Aircraft Updates*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TH57 Business Case/ Engineering Study	SS/BOA	JHU : Laurel, MD	0.000	0.423	Jun 2017	0.000		0.000		-		0.000	0.000	0.423	0.423
Training System Improvement Engineering Study T-6 Joint Study Efforts	MIPR	NAWCWD : China Lake, CA	0.000	0.164	Dec 2016	0.000		0.000		-		0.000	0.000	0.164	-
Training System Improvement T-6 Joint Study Efforts	MIPR	AFRL : Wright-Patterson AFB	0.000	0.104	May 2017	0.030	Nov 2017	0.069	Nov 2018	-		0.069	0.069	0.272	-
Training System Improvement T-45 VMTS Throttle Grip Engineering Analysis.	C/BA	Boeing : St. Louis, MO	0.000	0.700	Oct 2017	0.000		0.000		-		0.000	0.000	0.700	0.700
Training System Improvement T-44 Tail Section Fatigue Life Extension Study	C/FFP	Textron Aircraft Defense : Wichita, KS	0.000	0.142	Jun 2017	0.000		0.000		-		0.000	0.000	0.142	0.142
Training System Improvement T-45 Real-time Air Quality Sensor (RTAQS) Study	WR	NMRC : Silver Spring, MD	0.000	0.098	May 2017	0.000		0.000		-		0.000	0.000	0.098	-
Training System Improvement T-45 Real-time Air Quality Sensor (RTAQS) Study	MIPR	AFRL RH : Wright Patterson AFB, OH	0.000	0.328	May 2017	0.000		0.000		-		0.000	0.000	0.328	-
Training System Improvement T-45 Gas Chromatography Mass Spectrometry (GCMS) analysis	MIPR	NSWC Indian Head EOD Tech Div : Indian Head, MD	0.000	0.193	May 2017	0.000		0.000		-		0.000	0.000	0.193	-
Training System Improvement T-45 Analysis of Alternatives (AoA)	WR	NAWCAD : Patuxent River, MD	0.000	1.000	Aug 2017	0.000		0.000		-		0.000	0.000	1.000	-
		Subtotal	9.070	6.816		3.440		2.376		-		2.376	4.799	26.501	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0603208N / *Training System Aircraft*	Project (Number/Name) 3367 / *Training Aircraft Updates*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Training System Improvement: Cost category added for T-45 Analysis of Alternatives (AoA) Study and T-45 Physiological Episodes (PE) mitigation efforts including Real-time Air Quality Sensor (RTAQS) study and Gas Chromatography Mass Spectrometry (GCMS) analysis.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T45 Test & Certification	WR	NAWCAD : Patuxent River, MD	0.800	1.036	Nov 2016	0.656	Nov 2017	0.845	Nov 2018	-		0.845	0.203	3.540	-
T6 Test and Evaluation	C/CPFF	Textron Aircraft Defense : Wichita, KS	0.000	0.253	Dec 2016	0.000		0.000		-		0.000	0.000	0.253	0.253
TH57 Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.800	1.289		0.656		0.845		-		0.845	0.203	3.793	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T45 Project Management	Various	Various : Various	0.600	1.233	Nov 2016	1.324	Nov 2017	0.800	Nov 2018	-		0.800	2.065	6.022	-
T-45 Test Wing Maintenance	C/FFP	L-3 : Patuxent River, MD	0.830	1.613	Oct 2016	1.620	Oct 2017	1.616	Oct 2018	-		1.616	3.664	9.343	9.343
T45 PBTH Flight Hours	C/FFP	Rolls Royce : Indianapolis, IN	0.000	0.231	May 2017	0.125	May 2018	0.125	May 2019	-		0.125	0.000	0.481	0.481
T45 Travel	Various	NAVAIR : Patuxent River, MD	0.026	0.044	Oct 2016	0.045	Oct 2017	0.055	Oct 2018	-		0.055	0.067	0.237	-
T6 Project Management	Various	Various : Various	1.891	1.461	Nov 2016	0.000		0.000		-		0.000	0.000	3.352	-
T6 Test Wing Maintenance Parts	C/CPFF	DYNCORP International LLC : Patuxent River, MD	0.186	0.420	Oct 2016	0.266	Oct 2017	0.000		-		0.000	0.000	0.872	0.872

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0603208N / *Training System Aircraft*	Project (Number/Name) 3367 / *Training Aircraft Updates*	

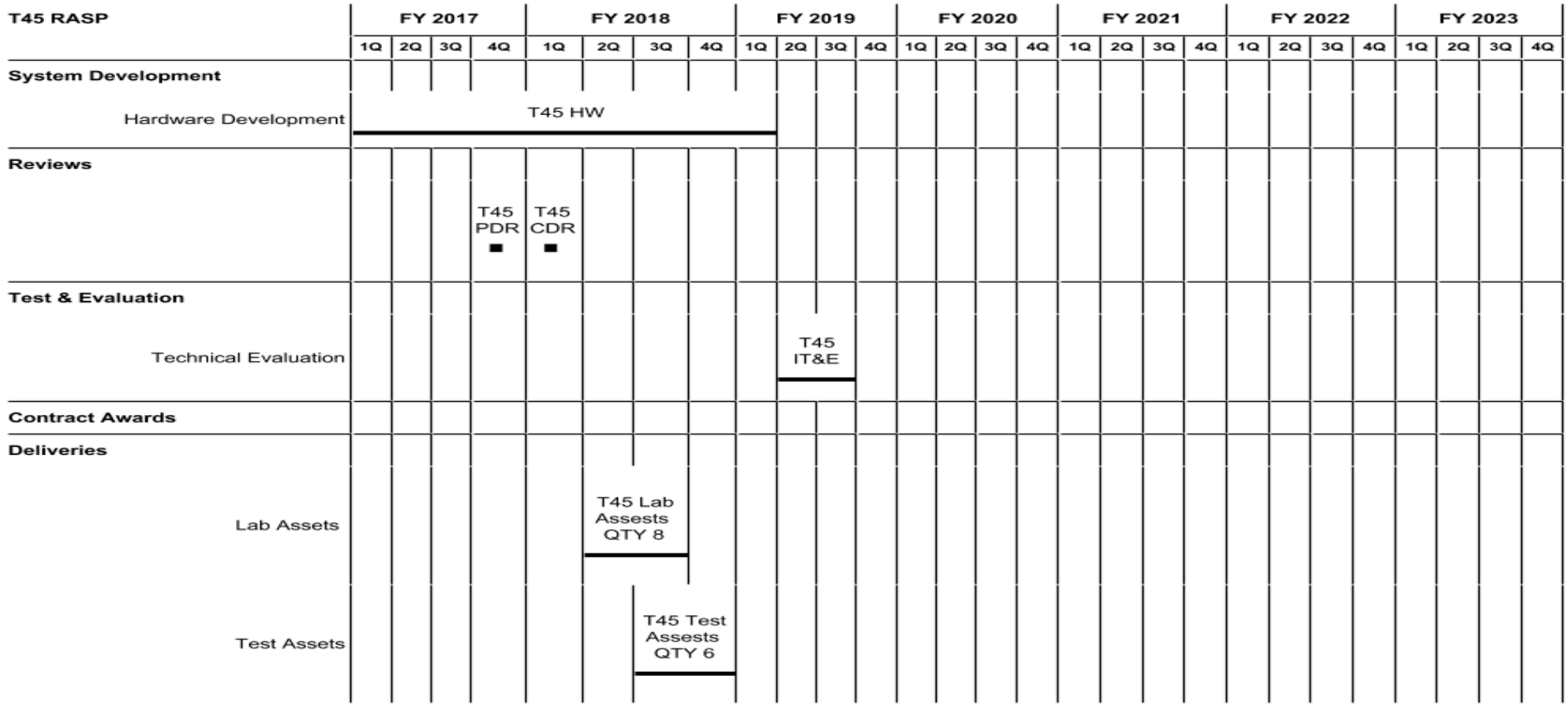
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T6 Travel	Various	NAVAIR : Patuxent River, MD	0.122	0.040	Oct 2016	0.030	Oct 2017	0.030	Oct 2018	-		0.030	0.035	0.257	-
TH57 Project Management	Various	Various : Various	0.000	0.232	Oct 2016	0.000		0.000		-		0.000	0.290	0.522	-
TH57 Travel	Various	Various : Various	0.000	0.042	Oct 2016	0.000		0.000		-		0.000	0.000	0.042	-
Training System Improvement Project Management	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	2.607	2.607	-
Training System Improvement Travel	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.225	0.225	-
		Subtotal	3.655	5.316		3.410		2.626		-		2.626	8.953	23.960	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	29.553	17.490		16.945		12.798		-		12.798	25.155	101.941	N/A

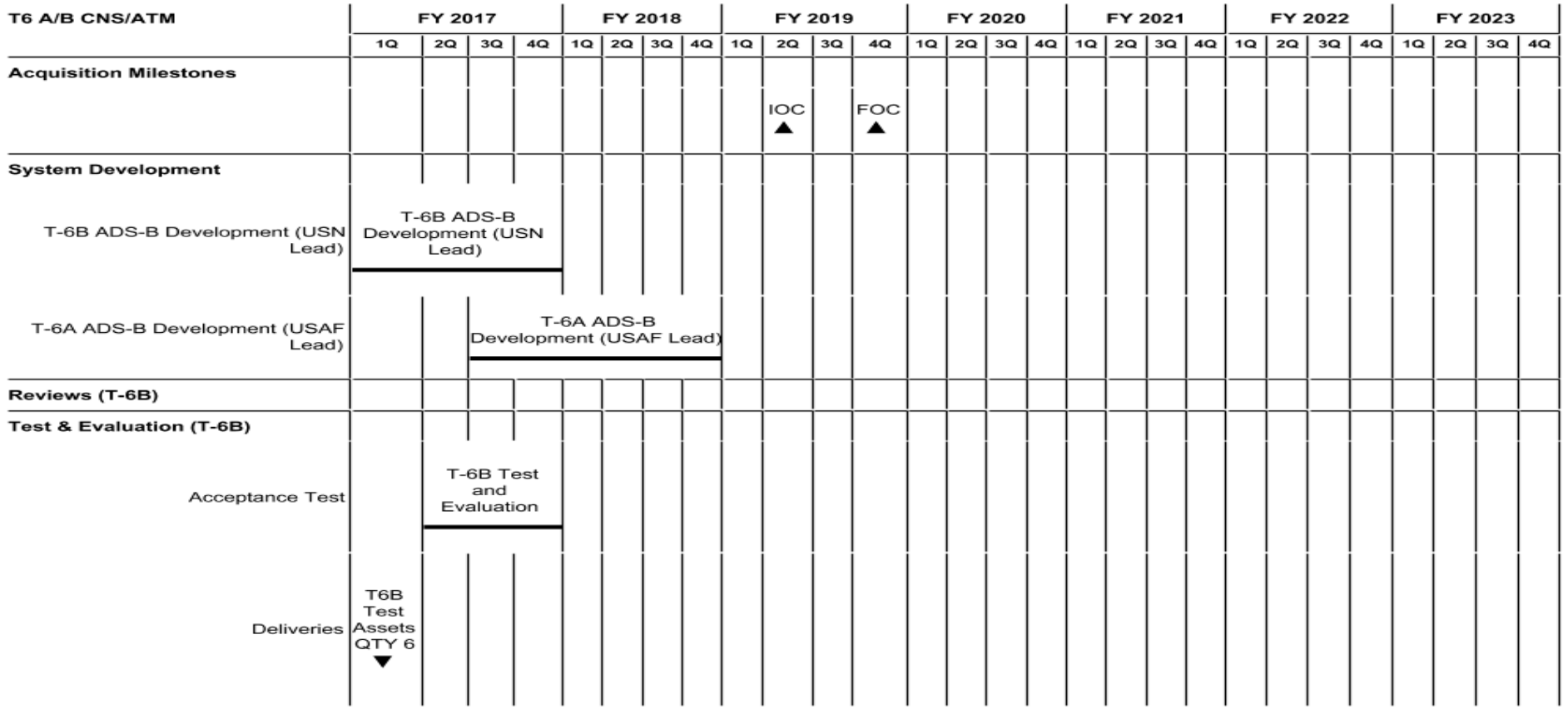
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*



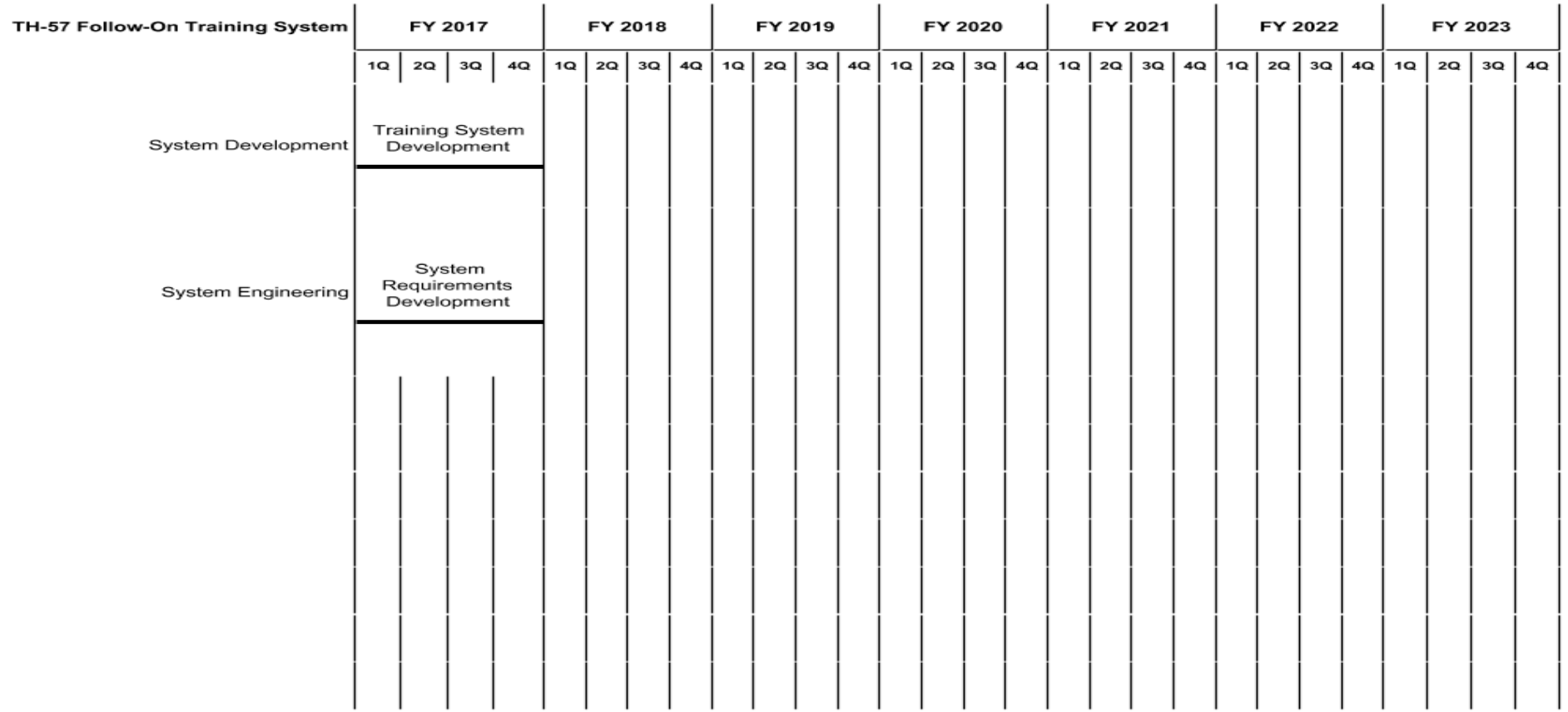
2019PB - 0603208N - 3367

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*



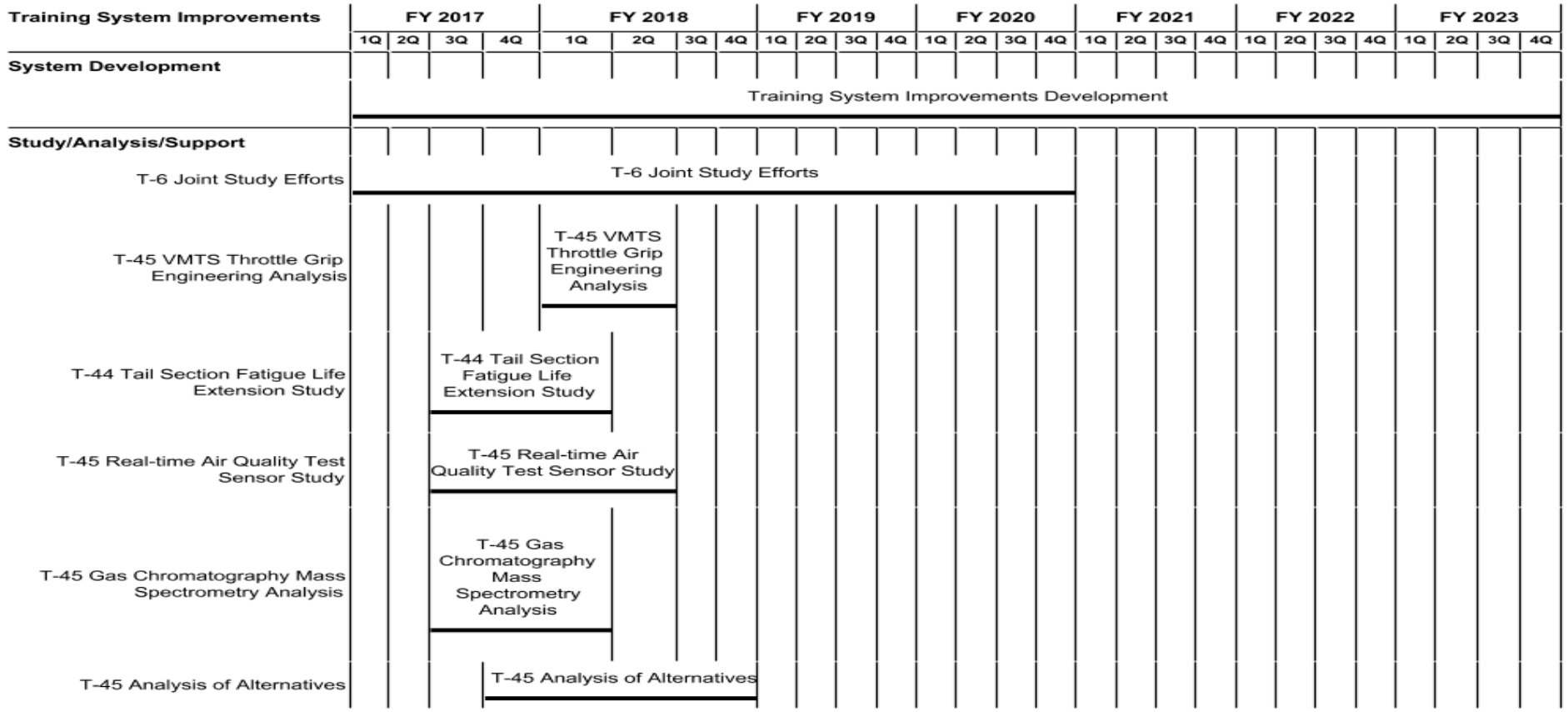
2019PB - 0603208N - 3367 Automatic Dependent Surveillance-Broadcast (ADS-B). T-6A ADS-B Development is Air Force led. T-6B ADS-B Development is Navy led. Reviews, T&E & Test Assets listed reflect T-6B Development efforts.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*



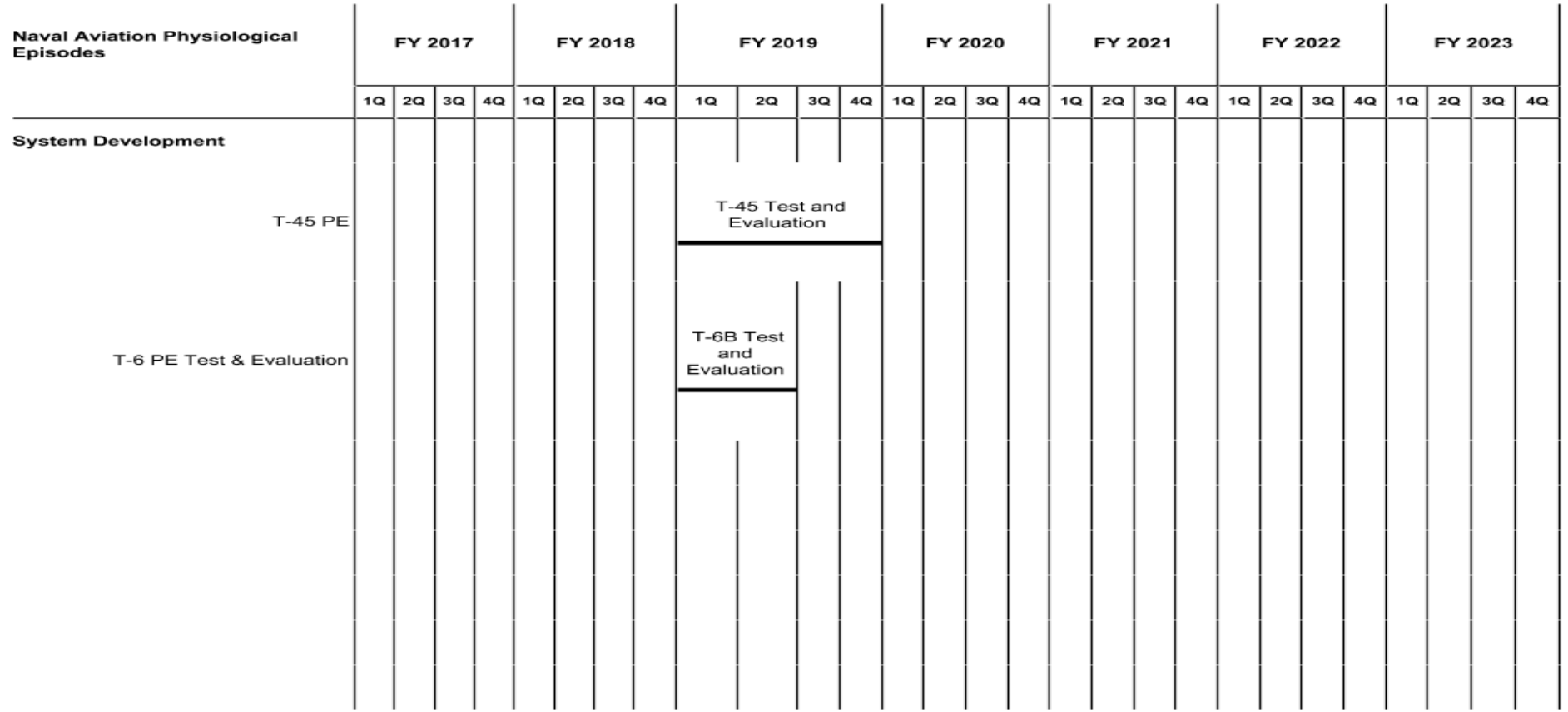
2019PB - 0603208N - 3367

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*



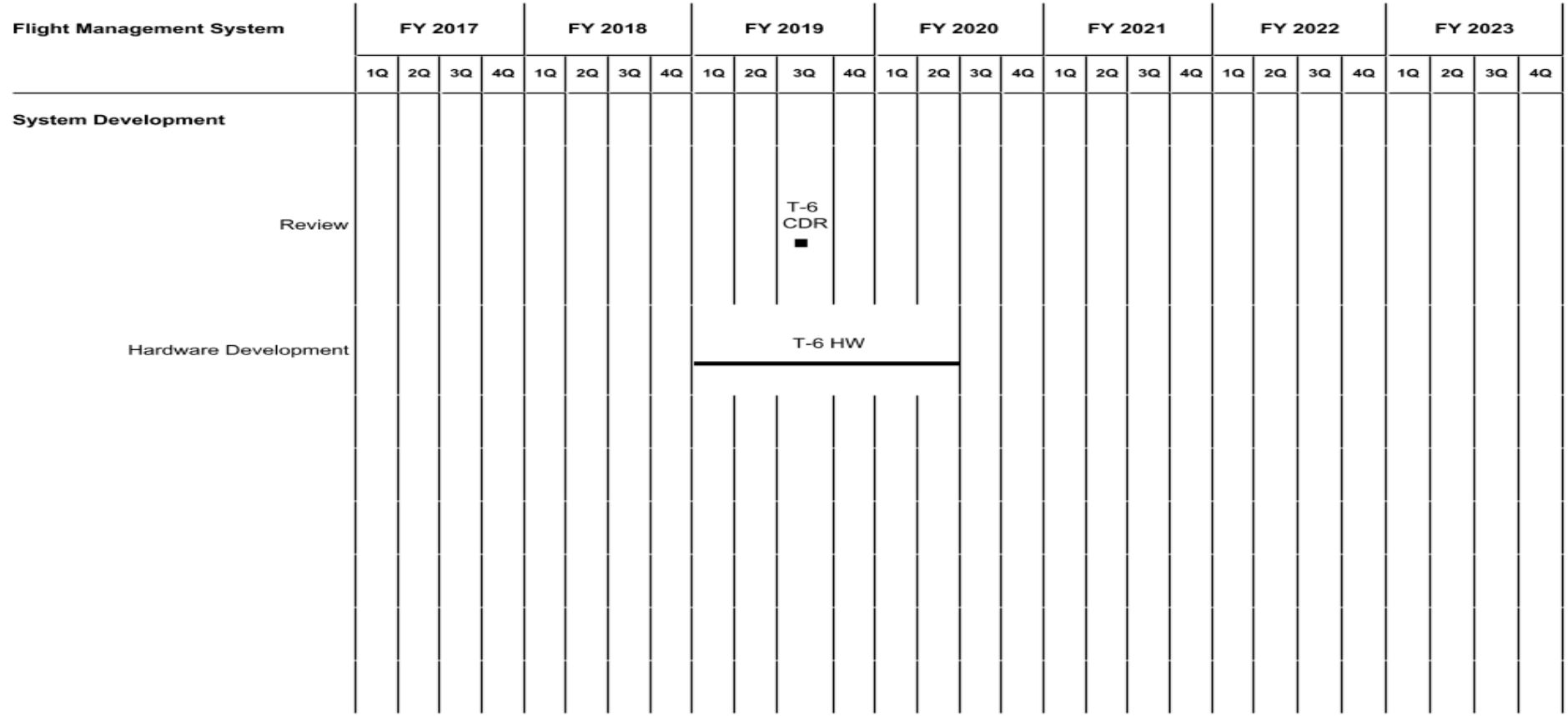
2019PB - 0603208N - 3367

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*



2019PB - 0603208N - 3367

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*



2019PB - 0603208N - 3367

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
T45 RASP				
System Development: Hardware Development: T45 Hardware Development	1	2017	1	2019
Reviews: T45 Preliminary Design Review	4	2017	4	2017
Reviews: T45 Critical Design Review	1	2018	1	2018
Test & Evaluation: Technical Evaluation: T45 Integrated Test & Evaluation	2	2019	3	2019
Deliveries: Lab Assets: T45 Lab Assets	2	2018	3	2018
Deliveries: Test Assets: T45 Test Assets	3	2018	4	2018
T6 A/B CNS/ATM				
Acquisition Milestones: Initial Operational Capability	2	2019	2	2019
Acquisition Milestones: Full Operational Capability	4	2019	4	2019
System Development: T-6B ADS-B Development (USN Lead): T-6B ADS-B Development	1	2017	4	2017
System Development: T-6A ADS-B Development (USAF Lead): T-6A ADS-B Development	3	2017	4	2018
Test & Evaluation (T-6B): Acceptance Test: T-6B Acceptance Test	2	2017	4	2017
Test & Evaluation (T-6B): Deliveries: Test Assets	1	2017	1	2017
TH-57 Follow-On Training System				
System Development: Follow-On Training System Development	1	2017	4	2017
System Engineering: Follow-On Training System Requirements Development	1	2017	4	2017
Training System Improvements				
System Development: Training System Improvements Development	1	2017	4	2023
Study/Analysis/Support: T-6 Joint Study Efforts: T-6 Joint Study Efforts	1	2017	4	2020
Study/Analysis/Support: T-45 VMTS Throttle Grip Engineering Analysis: T-45 VMTS Throttle Grip Engineering Analysis	1	2018	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Study/Analysis/Support: T-44 Tail Section Fatigue Life Extension Study: T-44 Tail Section Fatigue Life Extension Study	3	2017	1	2018
Study/Analysis/Support: T-45 Real-time Air Quality Test Sensor Study: T-45 Real-time Air Quality Test Sensor Study	3	2017	2	2018
Study/Analysis/Support: T-45 Gas Chromatography Mass Spectrometry Analysis: T-45 Gas Chromatography Mass Spectrometry Analysis	3	2017	1	2018
Study/Analysis/Support: T-45 Analysis of Alternatives: T-45 Analysis of Alternatives	4	2017	4	2018
Naval Aviation Physiological Episodes				
System Development: T-45 PE: T-45 Acceptance Test	1	2019	4	2019
System Development: T-6 PE Test & Evaluation: T-6 Acceptance Test	1	2019	2	2019
Flight Management System				
System Development: Review: Design Review	3	2019	3	2019
System Development: Hardware Development: T-6 Hardware Development	1	2019	2	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	87.883	5.889	26.786	32.128	-	32.128	33.940	52.813	135.992	148.325	Continuing	Continuing
1109: *CH/MH-53*	53.448	4.554	17.500	16.969	-	16.969	16.042	9.120	2.601	2.662	Continuing	Continuing
2460: *VH-3/VH-60*	34.435	1.335	1.309	1.310	-	1.310	0.000	0.000	0.000	0.000	0.000	38.389
3406: *Attack and Utility Replacement Aircraft*	0.000	0.000	7.977	13.849	-	13.849	17.898	43.693	133.391	145.663	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 390												

A. Mission Description and Budget Item Justification

This Program Element includes funding for the development support for improvements to current systems for CH/MH-53, MH-60 development, VH-3/VH-60, and new development of Future Vertical Lift (FVL) capability. The H-53 is the premier heavy lift helicopter for the Marine Corps and the only operational airborne mine sweeping platform for the Navy. H-53 RDT&E efforts focus on trade studies and risk reduction measures to identify candidate survivability, safety, avionics, cargo handling, cockpit and other airframe specific improvements to extend the service life. The VH-3/VH-60 is required to provide safe and timely transportation for the President and Vice President of the United States, heads of state and others as directed by the White House Military Office. Future Vertical Lift (FVL) is a Joint Department initiative to address vertical lift capability requirements and determine feasible and affordable solutions in support of the Joint Warfighter.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	6.268	26.786	32.685	-	32.685
Current President's Budget	5.889	26.786	32.128	-	32.128
Total Adjustments	-0.379	0.000	-0.557	-	-0.557
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.079	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.557	-	-0.557
• Congressional Directed Reductions Adjustments	-0.300	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604212N *I Other Helicopter Development*

Change Summary Explanation

The FY 2019 funding request was reduced by $0.523 million to account for the availability of prior year execution balances.

Cost/Technical/Schedule:

1109 CH/MH-53: Not Applicable

2460 VH-3/VH-60: Not Applicable

3406 Attack and Utility Replacement Aircraft: Not Applicable

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 1109 / *CH/MH-53*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1109: *CH/MH-53*	53.448	4.554	17.500	16.969	-	16.969	16.042	9.120	2.601	2.662	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 390

A. Mission Description and Budget Item Justification

The H-53 helicopter is the premier heavy lift helicopter for the Marine Corps and the only operational airborne mine sweeping platform for the Navy. H-53 efforts will continue to develop and qualify components, prior to production and approval decisions, in order to replace obsolete system components. Emphasis will be placed on supportability improvement modifications that will sustain the H-53 aircraft until the transition of the H-53K is complete. These efforts combined, will significantly improve the readiness of the H-53 fleet while reducing long term operational and supportability costs. Survivability efforts to address improved situational awareness to pilots will include improved Digital Interoperability and improve Degraded Visual Environment Awareness. Modeling and simulation will be used to the maximum practical extent throughout this effort. Manned Flight Simulator will be utilized to develop, install and test interim modifications to existing H-53 legacy avionics, while maintaining the original basic system footprint and functionality. As a part of this effort, a complete Electro Magnetic Vulnerability assessment will be required for the affected and/or modified systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: H-53 Avionics	1.480	2.848	3.716	0.000	3.716
Articles:	-	-	-	-	-
FY 2018 Plans: Integrate software applications for cockpit and avionics improvements, to include the development of new sensors. Investigate solutions to address the degraded visual environment. Develop flight control computer and test set design modifications to address anticipated obsolescence issues. Conduct Business Case Analyses to determine impact of high Operation and Support cost drivers and address alternatives to mitigate identified issues. Create basis for APR-39D(V)2 to improve digital interoperability and detection against radar guided threats.					
FY 2019 Base Plans: Integrate software applications for cockpit and avionics improvements, to include the development of new sensors. Develop flight control computer and test set design modifications to address anticipated obsolescence issues. Conduct Business Case Analyses to determine impact of high Operation and Support cost drivers and					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
address alternatives to mitigate identified issues. Development and Integration of improved Degraded Visual Environmental Awareness to include coupled flight control capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.868M from FY 2018 to FY 2019 is due the test sets and development efforts required for Degraded Visual Environment integration.					
Title: H-53 Survivability	0.440	1.296	1.472	0.000	1.472
Articles:	-	-	-	-	-
FY 2018 Plans: Perform trade studies, risk reduction, design, development, model, integration and test activities for H-53 survivability to include increased situational awareness via digital interoperability. ***FY 2019 Base Plans:*** Perform trade studies, risk reduction, design, development, model, integration and test activities for H-53 survivability to include increased situational awareness via digital interoperability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.176M from FY 2018 to FY 2019 is due to the increase of requirements for situational awareness in the H-53E aircraft.					
Title: H-53 Propulsion	0.433	0.442	0.450	0.000	0.450
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct Business Case Analyses to determine impact of high Operation and Support Propulsion cost drivers and address alternatives to mitigate, as well as developing/integrating proposed solutions to the risk associated with #2 engine fires. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct Business Case Analyses to determine impact of high Operation and Support Propulsion cost drivers. Develop, manufacture and test the new production T-64 fuel control prototype to improve safety, operability, reliability, while eliminating obsolescence issues. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** There is no significant difference between FY 2018 and FY 2019.					
Title: Project Management Support	0.726	1.620	1.652	0.000	1.652
Articles:	-	-	-	-	-
FY 2018 Plans: Provide in-house, field activity, and contractor support of IPTs to allow for studies and analyses, preparation of acquisition documentation and examination of equipment and avionics for the H-53. Efforts include, but are not limited to, government development support, engineering support, product management support, system engineering and logistics support, and travel for the H-53 program. ***FY 2019 Base Plans:*** Provide in-house, field activity, and contractor support of IPTs to allow for studies and analyses, preparation of acquisition documentation and examination of equipment and avionics for the H-53. Efforts include, but are not limited to, government development support, engineering support, product management support, system engineering and logistics support, and travel for the H-53 program. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.032M from FY 2018 to FY 2019 is due to the increase of system engineering support required for the fielding of Automated Logistics Environment and Degraded Visual Environment development efforts.					
Title: H-53 Airframe	1.475	2.175	1.554	0.000	1.554
Articles:	-	-	-	-	-
FY 2018 Plans: Develop software tool to support aircraft diagnostics, health monitoring and Fatigue Life Estimating (FLE) which will interface with Naval Enterprise Logistics Support Systems. The systems will provide a seamless environment					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
for processing data, troubleshooting and documenting the technical updates required for the H-53 airframe. Continue to develop tools to study/analyze and qualify components, prior to production and approval decisions, in order to replace obsolete system components. Perform trade studies, risk reduction, design, development, integration and test activities for the H-53 airframe to include, but not limited to, main rotor head, cowlings, aircraft structure, drive train, and various dynamic components. ***FY 2019 Base Plans:*** Develop software tool to support aircraft diagnostics, health monitoring and Fatigue Life Estimating (FLE) which will interface with Naval Enterprise Logistics Support Systems. The systems will provide a seamless environment for processing data, troubleshooting and documenting the technical updates required for the H-53 airframe. Continue to develop tools to study/analyze and qualify components, prior to production and approval decisions, in order to replace obsolete system components. Perform trade studies, risk reduction, design, development, integration and test activities for the H-53 airframe to include, but not limited to, main rotor head, cowlings, aircraft structure, drive train, and various dynamic components. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.621M from FY 2018 to FY 2019 is due to the completion of ALE tasks in FY 2019.					
Title: APR-39D(V)2	0.000	9.119	8.125	0.000	8.125
Articles:	-	-	-	-	-
FY 2018 Plans: Provide ability for consolidating digital interoperability and improve the probability of detection against radar guided threats. Corrects deficiencies from previous receiver by enabling self protection from radar guided threats on the battlefield. ***FY 2019 Base Plans:*** Continue development and integration of APR-39D(V)2 to consolidate digital interoperability and improve the probability of detection against radar guided threats. Corrects deficiencies from previous receiver by enabling self protection from radar guided threats on the battlefield. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.117M from FY 2018 to FY 2019 is due to the development efforts required by the Prime Contractor for APR-39D(V)2.					
Accomplishments/Planned Programs Subtotals	4.554	17.500	16.969	0.000	16.969

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0528: *H-53 Series*	61.665	39.662	70.997	-	70.997	63.509	54.582	66.231	74.253	148.869	2,117.080

Remarks

D. Acquisition Strategy

This is a non-ACAT program. H-53 RDT&E efforts will focus on trade studies and risk reduction measures to identify candidate survivability, interoperability, safety, avionics, cargo handling, cockpit and other airframe specific improvements to extend the service life.

E. Performance Metrics

Successfully perform studies, analysis and develop software to address emergent H-53 issues. Successfully support developmental and operation test activities to qualify aircraft modifications/upgrades.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 1109 / *CH/MH-53*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWC AD : Patuxent River, MD	4.953	1.464	Nov 2016	1.618	Nov 2017	0.784	Nov 2018	-		0.784	Continuing	Continuing	Continuing
Systems Engineering Contract	C/CPFF	Sikorsky : Stratford, CT	0.482	0.614	Feb 2017	0.500	Feb 2018	0.000		-		0.000	0.000	1.596	1.596
Systems Engineering	WR	Various : Various	0.000	0.344	Nov 2016	0.600	Nov 2017	2.075	Nov 2018	-		2.075	Continuing	Continuing	Continuing
Design and Development	TBD	TBD : TBD	0.000	0.000		4.995	Mar 2018	2.218	Mar 2019	-		2.218	0.000	7.213	-
Systems Engineering Contract	TBD	TBD : TBD	0.000	0.000		0.000		2.100	Feb 2019	-		2.100	0.000	2.100	-
Prior Year Prod Dev no longer funded in the FYDP	TBD	TBD : TBD	19.475	0.000		0.000		0.000		-		0.000	0.000	19.475	-
		Subtotal	24.910	2.422		7.713		7.177		-		7.177	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	Various : Various	3.885	0.786	Dec 2017	4.876	Mar 2018	3.277	Mar 2019	-		3.277	Continuing	Continuing	Continuing
GFE	Various	NAWC AD : Patuxent River, MD	3.581	0.319	Nov 2016	0.137	Nov 2017	0.280	Nov 2018	-		0.280	Continuing	Continuing	Continuing
		Subtotal	7.466	1.105		5.013		3.557		-		3.557	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	Various : Various	7.980	0.407	Mar 2017	1.674	Mar 2018	3.065	Mar 2019	-		3.065	Continuing	Continuing	Continuing
		Subtotal	7.980	0.407		1.674		3.065		-		3.065	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

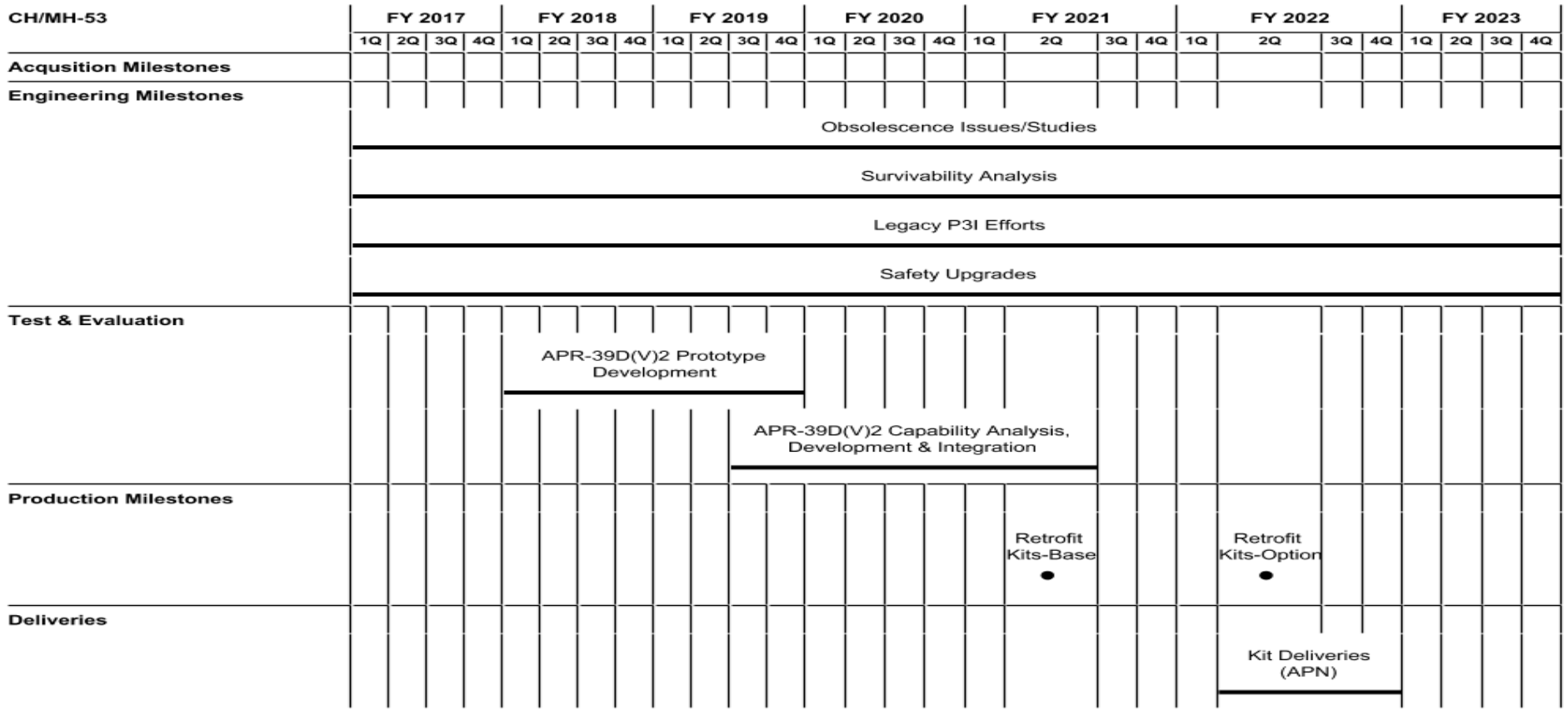
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWC AD : Patuxent River, MD	6.514	0.538	Nov 2016	2.950	Nov 2017	2.920	Nov 2018	-		2.920	Continuing	Continuing	Continuing
Travel	Various	Various : Various	1.904	0.082	Oct 2016	0.150	Oct 2017	0.250	Oct 2018	-		0.250	Continuing	Continuing	Continuing
Prior Year Mgmt no longer funded in the FYDP	Various	Various : Various	4.674	0.000		0.000		0.000		-		0.000	0.000	4.674	-
		Subtotal	13.092	0.620		3.100		3.170		-		3.170	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	53.448	4.554		17.500		16.969		-		16.969	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*



2019PB - 0604212N - 1109

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 1109 / *CH/MH-53*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CH/MH-53				
Engineering Milestones: - Obsolescence Issues/Studies	1	2017	4	2023
Engineering Milestones: - Survivability Analysis	1	2017	4	2023
Engineering Milestones: - Legacy P3I Efforts	1	2017	4	2023
Engineering Milestones: - Safety Upgrades	1	2017	4	2023
Test & Evaluation: APR-39D(V)2 Prototype Development	1	2018	4	2019
Test & Evaluation: APR-39D(V)2 Capability Analysis, Development & Integration	3	2019	2	2021
Production Milestones: Retrofit Kits-Base	2	2021	2	2021
Production Milestones: Retrofit Kits-Option	2	2022	2	2022
Deliveries: Kit Deliveries (APN)	2	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 2460 / *VH-3/VH-60*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2460: *VH-3/VH-60*	34.435	1.335	1.309	1.310	-	1.310	0.000	0.000	0.000	0.000	0.000	38.389
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Marine Helicopter Squadron One (HMX-1) is required to provide safe and timely transportation for the President and Vice President of the United States, heads of state and others as directed by the White House Military Office. Currently two Type, Model, Series aircraft are used by HMX-1 for the Presidential support mission - the VH-3D and the VH-60N. This project currently funds the VH Executive Helicopter's Aircraft Life Management Program (ALMP).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: VH Executive Helicopter Aircraft Life Management Program	1.335	1.309	1.310	0.000	1.310
Articles:	-	-	-	-	-
Description: VH Executive Helicopter Aircraft Life Management Program: Provides for management and improvement of all Executive Helicopter systems readiness including safety, operational weight, mission availability, structural integrity, component reliability, maintainability, software, and obsolescence issues as they arise.					
FY 2018 Plans: Provide government program management and engineering support for efforts associated with the Aircraft Life Management Program ensuring aircraft availability and mission readiness to the VH Executive Helicopters.					
FY 2019 Base Plans: Provide government program management and engineering support for efforts associated with the Aircraft Life Management Program ensuring aircraft availability and mission readiness to the VH Executive Helicopters.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: There is no significant difference between FY 2018 and FY 2019.					
Accomplishments/Planned Programs Subtotals	1.335	1.309	1.310	0.000	1.310

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/056600: *Executive Helicopters Series*	63.754	38.787	23.566	-	23.566	8.930	28.795	60.897	77.239	Continuing	Continuing

Remarks

Results of the Aircraft Life Management Program trade studies and risk reduction efforts will lead to modifications to be addressed through the program's Obsolescence Management Program and VH Comm Suite Upgrade Operational Safety and Improvement Programs as directed by the Deputy Secretary of Defense.

D. Acquisition Strategy

VH Executive Helicopter ALMP will include trade studies and risk reduction efforts necessary to address safety, operational weight, mission availability, structural integrity, component reliability, maintainability, software, and obsolescence issues as they arise.

E. Performance Metrics

Completion of VH Executive Helicopter Aircraft Life Management Program efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	SS/CPFF	Sikorsky : Stratford, CT	8.675	0.000		0.000		0.000		-		0.000	0.000	8.675	8.675
Primary HW Development	SS/CPFF	Sikorsky : Stratford, CT	0.899	0.000		0.000		0.000		-		0.000	0.000	0.899	0.899
Software Development	SS/FFP	Rockwell Collins : Cedar Rapids, IA	2.425	0.000		0.000		0.000		-		0.000	0.000	2.425	2.425
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.987	0.000		0.000		0.000		-		0.000	0.000	1.987	-
Systems Engineering	Various	Various : Various	0.607	0.000		0.000		0.000		-		0.000	0.000	0.607	-
Prior Year Prod Dev no longer funded in the FYDP	Various	Various : Various	5.321	0.000		0.000		0.000		-		0.000	0.000	5.321	-
		Subtotal	19.914	0.000		0.000		0.000		-		0.000	0.000	19.914	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation-WBLoS	WR	NAWCAD : Patuxent River, MD	1.875	0.227	Nov 2016	0.299	Nov 2017	0.304	Nov 2018	-		0.304	0.000	2.705	-
		Subtotal	1.875	0.227		0.299		0.304		-		0.304	0.000	2.705	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : Patuxent River, MD	9.493	0.000	Nov 2016	0.000	Nov 2017	0.000	Nov 2018	-		0.000	0.000	9.493	-
Program Management Support	WR	NAWCAD : Patuxent River, MD	2.208	1.026	Nov 2016	0.960	Nov 2017	0.958	Nov 2018	-		0.958	0.000	5.152	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	SS/CPFF	NAVSEA : Washington Navy Yard, DC	0.600	0.030	Nov 2016	0.020	Nov 2017	0.020	Nov 2018	-		0.020	0.000	0.670	0.671
Travel	Various	Various : Various	0.345	0.052	Oct 2016	0.030	Oct 2017	0.028	Oct 2018	-		0.028	0.000	0.455	-
		Subtotal	12.646	1.108		1.010		1.006		-		1.006	0.000	15.770	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	34.435	1.335		1.309		1.310		-		1.310	0.000	38.389	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

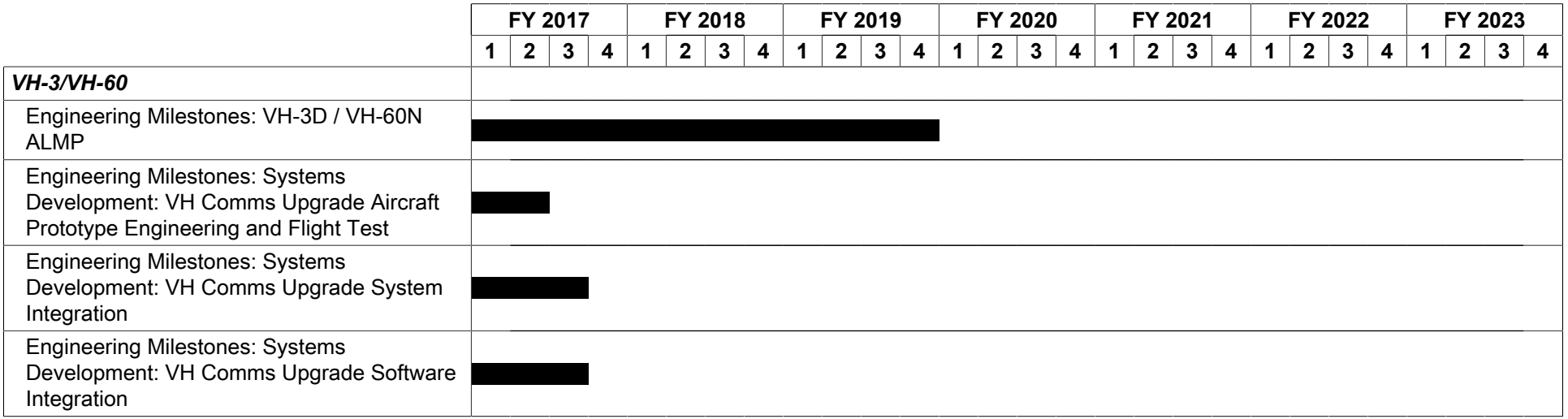


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 2460 / *VH-3/VH-60*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
VH-3/VH-60				
Engineering Milestones: VH-3D / VH-60N ALMP	1	2017	4	2019
Engineering Milestones: Systems Development: VH Comms Upgrade Aircraft Prototype Engineering and Flight Test	1	2017	2	2017
Engineering Milestones: Systems Development: VH Comms Upgrade System Integration	1	2017	3	2017
Engineering Milestones: Systems Development: VH Comms Upgrade Software Integration	1	2017	3	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 3406 / *Attack and Utility Replacement Aircraft*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3406: *Attack and Utility Replacement Aircraft*	0.000	0.000	7.977	13.849	-	13.849	17.898	43.693	133.391	145.663	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Future Vertical Lift (FVL) is a Joint Department initiative to address vertical lift capability requirements and determine feasible and affordable solutions in support of the Joint Warfighter. The FVL Capability Set 3 (CS3) program, led by the Department of the Army, will develop and field a replacement for US Army and USMC aircraft with a more capable, maintainable, and reliable rotorcraft to meet the needs of the services. FVL will provide unmatched strategic, operational, and tactical agility to perform a multitude of missions currently unachievable by any conventionally configured rotorcraft. FVL will be a force multiplier with superior performance, payload, survivability, agility, endurance, and reliability that enables warfighters to win in a complex world. FVL offers revolutionary operational opportunities over current Vertical Take Off Landing (VTOL) aircraft and will field by 2031.

The Marine Corps FVL requirements emphasize range and speed similar to the MV-22. FVL will increase the Marine Air Ground Task Force's (MAGTF) capacity of long-range fires. FVL will utilize DOTmLPF-P that will include all facets of a program with particular focus on life-cycle cost reductions through common processes, support equipment, logistic support and component commonality utilizing non-materiel solutions, such as maintenance strategies, training solutions, and infrastructure requirements. The air vehicle will include primary mechanical, electrical, pneumatic, and structural components such as drivetrain, generators, landing gear, pumps, controls, seats, etc. The mission subsystems will include all on- and off-board components with embedded control software for those components that provide all mission functionality, cockpit displays, cockpit hardware subsystem controllers, and interfaces. The architecture will include the fundamental organization of the complete system, the processing method/component(s), the system level software, the operating environment, and the on-aircraft infrastructure to facilitate integration of all subsystems and platform.

FVL is a new start in FY2018.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Future Vertical Lift	0.000	7.977	13.849	0.000	13.849
Articles:	-	-	-	-	-
FY 2018 Plans: Provide initial support for Future Vertical Lift (FVL) Analysis of Alternatives (AoA) to assess the technical feasibility, technical risk, and affordability of potential strategic solutions with the intent to develop the next generation of rotary wing aircraft supporting new Vertical Take Off Landing capabilities common with the US Army. Tasks to be performed include but are not limited to: AoA support, Acquisition Program Management					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
functions, Engineering modeling and analysis, TEMP development, System Specification and Draft Capability Development Document development, and design trade studies and prototyping on the Air Vehicle and all associated systems. These efforts will include but not be limited to studies, virtual simulation, conceptual design, prototyping of Air Vehicle, Avionics, Propulsion and Dynamics, Communications and Navigation, Weapons and Fire Control, Human Systems Integration, Survivability and Vulnerability, Missions and Missions Systems Management, Reliability and Maintainability, Training, Logistics, Sensor, Pilotage and Targeting Systems, VMS/Flight Control, and Software/Hardware architecture. Support for these efforts will come from government, industry and academia such as Naval Research Labs, DARPA, John Hopkins APL, various industry partners. Initial FVL contract awards for FY18 could be contract support services, academia, or industry quick turn studies. All contract actions will be smaller scale efforts to support the overall initial AoA effort.					
FY 2019 Base Plans: FY 2019 BASE PLANS WEAPONS AND SENSORS TESTING AND INTEGRATION: Continue initial support for Future Vertical Lift (FVL) Analysis of Alternatives (AoA) to assess the technical feasibility, technical risk, and affordability of potential strategic solutions with the intent to develop the next generation of rotary wing aircraft supporting new Vertical Take Off Landing capabilities common with the US Army. Tasks to be performed include but are not limited to: AoA support, Acquisition Program Management functions, Engineering modeling and analysis, TEMP development, System Specification and Draft Capability Development Document development, and design trade studies and prototyping on the Air Vehicle and all associated systems. These efforts will include but not be limited to studies, virtual simulation, conceptual design, prototyping of Air Vehicle, Avionics, Propulsion and Dynamics, Communications and Navigation, Weapons and Fire Control, Human Systems Integration, Survivability and Vulnerability, Missions and Missions Systems Management, Reliability and Maintainability, Training, Logistics, Sensor, Pilotage and Targeting Systems, VMS/Flight Control, and Software/Hardware architecture. Support for these efforts will come from government, industry and academia such as Naval Research Labs, DARPA, John Hopkins APL, and various industry partners. Continued FVL contract awards for FY19 could be contract support services, academia, or industry quick turn studies. All contract actions will be smaller scale efforts to support the overall initial AoA effort.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $5.872M from FY 2018 to FY 2019 is due to Future Vertical Lift (FVL) requirements for the Marine Air Ground Task Force's (MAGTF).					
Accomplishments/Planned Programs Subtotals	0.000	7.977	13.849	0.000	13.849

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Army plans to initiate an Analysis of Alternatives (AoA) in the 3rd Quarter FY 2017 to begin the assessment of the technical feasibility, operational feasibility, technical risk, and affordability of potential solutions. The AoA will take advantage of previous studies, ongoing Advanced Technology Development Science & Technology (S&T) projects, and input from Government, Industry and Academia. The results of the AoA and Technology Readiness Assessments will be used to assist in determining if a Milestone A or Milestone B entry is appropriate. Once the appropriate Milestone entry point has been determined, the program will enter at the appropriate Milestone with an appropriate RFP Release. The program will complete development and testing of the most cost effective system before entering the Production and Deployment phase in the FY2031 timeframe.

E. Performance Metrics

A studies and analysis contract will be awarded 2Q FY 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604212N / *Other Helicopter Development*	Project (Number/Name) 3406 / *Attack and Utility Replacement Aircraft*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	TBD : TBD	0.000	0.000		4.850	Mar 2018	3.740	Jan 2019	-		3.740	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		4.850		3.740		-		3.740	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test and Evaluation	WR	TBD : TBD	0.000	0.000		0.575	Mar 2018	0.587	Nov 2018	-		0.587	Continuing	Continuing	Continuing
Studies and Anaylsis	C/CPFF	TBD : TBD	0.000	0.000		0.175	Mar 2018	6.929	Jan 2019	-		6.929	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.750		7.516		-		7.516	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPIF	Various : Various	0.000	0.000		0.100	Mar 2018	0.000	Nov 2018	-		0.000	Continuing	Continuing	Continuing
Program Management Support	TBD	Various : Various	0.000	0.000		2.072	Mar 2018	2.113	Nov 2018	-		2.113	Continuing	Continuing	Continuing
Travel	WR	NAVAIR : Patuxent River, MD	0.000	0.000		0.205	Mar 2018	0.480	Oct 2018	-		0.480	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*

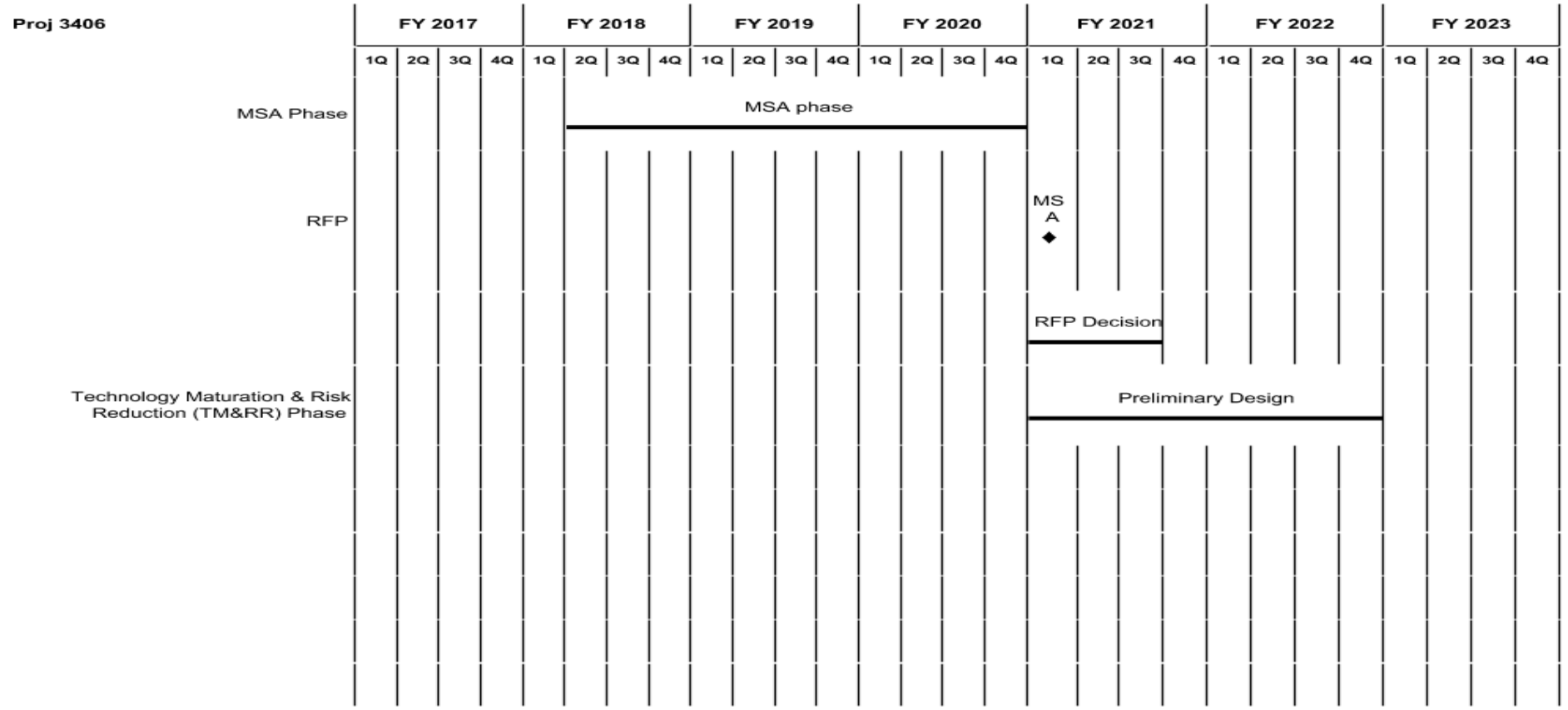
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.000	0.000		2.377		2.593		-		2.593	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		7.977		13.849		-		13.849	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*



2019DON - 0604212N - 3406

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604212N / *Other Helicopter Development*	**Project (Number/Name)** 3406 / *Attack and Utility Replacement Aircraft*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3406				
MSA Phase: Capability Refinement	2	2018	4	2020
RFP: Milestone A	1	2021	1	2021
RFP: Request for Proposal	1	2021	3	2021
Technology Maturation & Risk Reduction (TM&RR) Phase: TM&RR	1	2021	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604214M / *AV-8B Aircraft - Engine Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	460.370	0.000	0.000	46.363	-	46.363	38.735	19.671	16.878	17.215	Continuing	Continuing
0652: *AV-8B*	460.370	0.000	0.000	46.363	-	46.363	38.735	19.671	16.878	17.215	Continuing	Continuing

A. Mission Description and Budget Item Justification

The program provides for AV-8B Design, Development, Integration, and Test of various platform improvements such as: Engine Life Management Program (ELMP), Escape Systems, Joint Mission Planning System (JMPS), and Block upgrades to various mission systems and software, avionics and communications systems, navigation equipment, weapons carriage and countermeasures, and unique flight testing, and the Obsolescence Replacement (OR)/Readiness Management Plan (RMP) including structural, hydraulic, electrical, environmental, and mechanical systems. The JMPS is required as part of the Department of the Navy directed migration to a common Navy and Marine Corps mission planning system. OR/RMP represents all engineering activities for development and design to support aircraft safety flight clearances, concept explorations, responses to evolving threats, and developments to support Program Objective Memorandum. The program's Evolutionary Acquisition Strategy includes Design, Development, Integration, and Test activities under the consolidated effort of Block Developments: H6.1, H6.2 and follow-on block upgrades, to include a H7.0 block upgrade that will be required to implement full Link 16 capability and integrate AIM-9X. An H6.2 update, including the Common Avionics Program, provides AV-8B a self-contained Global Positioning System navigation capability that is required to access preferred airspaces, and will include a Litening Operational Flight Program (OFP) V3, and initial Link 16 Precise Participant Location and Identification capability, which will provide interoperability, digital combat identification and increase situational awareness on the battlefield. Link 16 is a Top 10 item in the Operational Advisory and Systems Safety Groups. AV-8B funding supports peculiar flight test requirements to include weapons integration/carriage and avionics and software/firmware upgrades. The H7.0 OFP will fully implement the Harrier Link 16 integration, which will provide information sharing capabilities and integration of an increased number of Link 16 messages and the ability to act on shared target track information. Connection to the Link 16 network is vital to the AV-8B's ability to operate within some Command and Control situations and Operational Plans, as designed today, as well as provide a tactical capability for the more effective and safe prosecution of both airborne and ground targets. Continued AV-8B combat relevance and ability to respond to evolving and emergent threats through end of service is critical to the Marine Air-Ground Task Force's ability to generate aviation combat power throughout the transition to F-35B. J-series, K-series, Tactical Targeting Network Technology, and other emerging datalink technology messages are required to support current and future mission threads. Linked performance on par with current tactical platforms as well as design to communicate with F-35 is required for the AV-8B to remain tactically relevant to transition. H7.0 will also include the integration and test of weapons and sensors such as AIM-9X and Litening OFP V4, and will integrate required Radar Display Computer processing improvements to enable H7.0 functionality. Additionally, a Helmet Mounted Cueing System (HMCS), Unique Weapons and Countermeasures software integration and stores expansion testing will be required, to include Advanced Precision Kill Weapons System, AIM-9X, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and AIM-120 unique platform flight test which will be required to utilize updated AIM-120C variants on the AV-8B and utilize the AIM-120 in mixed stores loadouts, as well as test of emergent tactical requirements. The ELMP is a comprehensive plan to increase and maintain safety of flight and operational readiness of the AV-8B F402-RR-408 Engine and accessories. PMA-257 will accomplish this mission by conducting Engineering Project Description investigations to develop engineering solutions that address emergent safety, obsolescence, foreign object debris detection and prevention, fatigue life and maintenance issues. The OR/RMP is required to ensure the AV-8B air vehicle's sustained mission availability, and safe and reliable operational readiness until end of service. Air vehicle sustainment requires component and system analyses, technical planning, identification, prioritization, and diagnosis of emergent problems and the allocation of resources for the development, testing and flight clearance of engineering solutions in the areas of flight, crew safety, and escape systems and structural integrity, obsolescence, systems reliability and maintainability, inventory preservation, alternative mission development,

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604214M *I AV-8B Aircraft - Engine Dev*

or other emergent material or equipment conditions affecting AV-8B systems readiness. Activities include research/analysis for system safety deficiency corrections, fuel system safety improvements, structural analyses, monitoring and integrity analysis, component compatibility, component and materials obsolescence analyses and mitigation development, explorations for aging equipment, reliability improvement analyses and design developments. FY 2019 continues development efforts and associated obsolescence and readiness requirements for ELMP, RMP, Link 16, weapons and sensors carriage/integration, peculiar flight test and OFP updates.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	46.363	-	46.363
Total Adjustments	0.000	0.000	46.363	-	46.363
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	43.524	-	43.524
• Rate/Misc Adjustments	0.000	0.000	2.839	-	2.839

Change Summary Explanation

Funds increase from FY 2018 to FY 2019 due to transfer of effort from PE 0604245N beginning in FY 2019.

The FY 2019 funding request was reduced by $1.800 million to account for the availability of prior year execution balances.

Schedule:

H7.0 IOC, H7.0 DT/IT, H7.0 Software Delivery completion and AIM-9X Integration and H7.0 Development adjusted two quarters due to completion of H7.0 system requirement review and gaining greater understanding of software coding and test requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0652: *AV-8B*	460.370	0.000	0.000	46.363	-	46.363	38.735	19.671	16.878	17.215	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides for AV-8B Design, Development, Integration and Test of the following improvements: The Engine Life Management Program (ELMP), Operational Flight Program (OFP) and Avionics/Weapons Integration, Escape System, and Readiness Management Plan (RMP). The ELMP is a comprehensive plan to increase safety of flight and operational readiness of the AV-8B F402-RR-408 Engine and Gas Turbine Starter, as well as other critical engine components. The Program Office will accomplish this mission through the Component Improvement Program, which entails Engineering Project Description investigations to derive safety and reliability improvements to the engine and engine components. The Joint Mission Planning System is required as part of the Department of Navy directed migration to a common Navy and Marine Corps mission planning system. H6.2 provides Global Positioning System navigation capabilities, a Litening common OFP update and initial Link 16 capability to include use of the APX-123, initial Mode 5 capability, as well as software updates. H7.0 OFP will integrate full Harrier Link 16 capability and provide software updates. H7.0 will also integrate AIM-9X, a Litening Common OFP update, provide Advanced Precision Kill Weapon System (APKWS) integration improvements, Joint Standoff Weapons (JSOW), and common avionics ADS-B (out), Mode 5, and Mode S Identification Friend or Foe capabilities as well as integrate required Radar Display Computer processing improvements to enable H7.0 functionality. Other specific efforts include peculiar integration and flight test requirements such as AIM-120C flight test, as AIM-120A/B will become obsolete, as well as AIM-120 mixed stores flight test, unique weapons, sensors, and countermeasures integration and stores expansion to include APKWS, Helmet Mounted Cueing System (HMCS), AIM-9X, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and unique flight test of other avionics, sensors, or weapons systems , or emergent tactical requirements, as they arise. The program is working closely with the Common Avionics Program and the Allies (Spain and Italy) on all efforts. RMP represents all engineering activities for development, design and test to support aircraft safety, flight clearance and concept exploration for resolution of emergent safety, service life, escape systems, compatibility, obsolescence, and readiness issues as well as response to fleet urgent operational requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Development of RMP Engineering Change Proposals	0.000	0.000	8.043	0.000	8.043
Articles:	-	-	-	-	-
Description: Develop obsolescence solutions to improve safety, structural integrity, and systems reliability of the AV-8B aircraft.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: Extension to AV-8B End of Service date requires continued obsolescence mitigation efforts to maintain aircraft readiness. The program will continue to address known, predicted, and emergent obsolescence					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214M / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
equipment issues, continuing efforts from prior years. Continue fatigue life tracking analyses and algorithm update development. Continue Fuselage Fatigue Life Assessment to assure continued safe operation of the aircraft through the end of service date. Continue the development and flight tests of Outrigger Landing Gear improvements. Systems engineering will support ongoing and emergent analysis and design/ development/ test efforts required to identify Engineering Change Proposal requirements to correct systems safety, structural integrity, compatibility, and readiness issues including efforts required to respond to evolving and emergent threats, mission systems, communications systems, navigation equipment, weapons carriage and countermeasures, structural, hydraulic, electrical, environmental, and mechanical systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $8.348M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.					
Title: Operational Flight Program (OFP) and Avionics Weapons Systems Development and Integration	0.000	0.000	32.388	0.000	32.388
Articles:	-	-	-	-	-
Description: Develop, integrate, and test aircraft OFP updates, mission planning updates, Litening Pod software updates/capability expansions, support aircraft avionics development efforts, integrate and test unique weapons systems, sensors, and countermeasures such as AIM-120C, AIM-9X, Helmet Mounted Cueing System (HMCS), Advanced Precision Kill Weapon System, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and other weapons/avionics and sensor systems and emergent tactical requirements as they arise, perform stores expansion testing, and conduct Digital Interoperability (to include Link 16) development, integration, and test efforts. Evaluate future capability expansions via studies and analyses. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Funds will provide for future capability expansion studies and analyses efforts, efforts required to respond to evolving and emerging threats, peculiar flight test requirements to include various required weapons/sensors/ countermeasures/stores expansion integration and testing such as AIM-120, AIM-9X, ALE-43, JSOW, and other					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214M / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
weapons/avionics systems as they arise. Continue H7.0 OFP/Link 16/ AIM-9X software integration and begin test efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $32.388M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.					
Title: F402-RR-408 Engine Safety and Reliability Enhancements ***Articles:*** ***Description:*** Improve Safety and Reliability of the F402-RR-408 Engine for the AV-8B Harrier. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** The engineering CIP will conduct engineering investigations to develop ECPs for improvements and design solutions to correct deficiencies resulting from safety, obsolescence, FOD detection and prevention and structural fatigue for the engine and engine accessories, to maintain readiness and to meet mission requirements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $5.932M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.	0.000 -	0.000 -	5.932 -	0.000 -	5.932 -
Accomplishments/Planned Programs Subtotals	0.000	0.000	46.363	0.000	46.363

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0514: *AV-8 Series*	56.275	43.555	58.577	-	58.577	42.082	33.948	37.866	38.647	91.978	1,721.898

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214M / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

D. Acquisition Strategy

The Obsolescence Replacement (OR)/Readiness Management Plan (RMP) ensures the maximum readiness levels for the AV-8B Type/Model/Series by maintaining post production engineering and logistic support with the two Original Equipment Manufacturers (OEMs). RMP tracks readiness degraders, identifies and addresses obsolescence for non avionics systems, and identifies and addresses emerging in-service material developments related to ease of maintenance, safety, airframe life management and improved performance. The multi-disciplined team of program management, engineering, logistics, and financial personnel develop ECPs, Rapid Action Minor Engineering Changes, Interim Rapid Action Changes to publications, trainer and support equipment modifications necessary to maintain aircraft reliability and safety. The RMP additionally supports the constant improvement and analysis of fleet Fatigue Life Expended data to maximize aircraft structural life and to support the NAVAIR annual Structural Appraisal of Fatigue Effects report required by OPNAV. Funding for the Engine Life Management Program will be placed on a cost-type contract to Rolls-Royce to address safety of flight issues, top readiness degraders, engine removal and mission failure drivers in order to improve Fleet readiness and reduce cost of ownership of the F402-RR-408 and accessories. It is also developed to assess life management program issues and design fixes for any service revealed deficiencies. The program's Evolutionary Acquisition Strategy includes Design, Development, Integration and Test activity under the consolidated effort of Block Developments: H2.0, H4.0, H5.0, H6.0, H6.1, H6.2, H7.0 and following Operational Flight Programs. The development and integration of Joint Mission Planning System occurred concurrently with H2.0. H4.0 Block improvements included the Tactical Aircraft Moving Map Capability. H5.0 Block Upgrade provided Dual Mode Laser Guided Bomb, Litening Centerline/Station 4 (improvement of current weapons carriage capability). The H6.2 update is being accomplished in conjunction with the Common Avionics Program and provides a Global Positioning System Navigation capability for AV-8B, a Litening Common Operational Flight Program update, initial Link 16 capability to include the use of APX-123 and initial Mode 5 functionality. Full Harrier Link 16 integration will require an H7.0 Operational Flight Program subsequent to H6.2 and will provide the AV-8B the Link 16 capability. H7.0 will also be accomplished in conjunction with Common Avionics Program and will integrate AIM-9X, ADS-B (out), Mode 5, Mode S and Advanced Precision Kill Weapon System (APKWS) integration improvements. Peculiar flight test efforts to include weapons, avionics, and sensors integration such as AIM-120, AIM-9X, APKWS, ALE-43, HMCS, standoff weapons such as Joint Standoff Weapons (JSOW), other avionics/weapons and sensors systems and emergent tactical requirements as they arise. Stores expansion efforts will be conducted by NAWCWD and AV-8B flight test squadrons in FY18.

E. Performance Metrics

Achieve Engine Life Management Program Rolls-Royce Component Improvement Program cost plus fixed fee contract award 1st Quarter FY 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - ELMP	C/CPFF	Rolls-Royce PLC : Bristol, GB	36.187	0.000		0.000		1.856	Dec 2018	-		1.856	6.018	44.061	44.061
Primary Hardware Development - ELMP	C/FFP	ONTIC (Goodrich) PS : Pitstone, GB	6.881	0.000		0.000		0.600	Mar 2019	-		0.600	1.380	8.861	8.861
Primary Hardware Development - OFP	WR	NAWCWD : China Lake, CA	71.061	0.000		0.000		12.107	Dec 2018	-		12.107	Continuing	Continuing	Continuing
Primary Hardware Development - OFP	C/FFP	Boeing : St. Louis, MO	10.777	0.000		0.000		3.100	Dec 2018	-		3.100	3.319	17.196	17.196
Primary Hardware Development - OFP	C/CPFF	Raytheon : Waltham, MA	4.450	0.000		0.000		2.802	Dec 2018	-		2.802	4.596	11.848	11.848
Systems Engineering - RMP	C/FFP	Boeing : St. Louis, MO	36.570	0.000		0.000		4.431	Jan 2019	-		4.431	14.326	55.327	55.327
Systems Engineering - RMP	WR	NAWCWD : China Lake, CA	3.755	0.000		0.000		0.096	Nov 2018	-		0.096	Continuing	Continuing	Continuing
Systems Engineering - RMP	WR	NAWCAD : Patuxent River, MD	9.238	0.000		0.000		1.451	Nov 2018	-		1.451	Continuing	Continuing	Continuing
Systems Engineering - OFP	WR	NAWCWD : China Lake, CA	0.837	0.000		0.000		1.571	Nov 2018	-		1.571	Continuing	Continuing	Continuing
Systems Engineering - OFP	TBD	TBD : TBD	0.000	0.000		0.000		0.052	Dec 2018	-		0.052	Continuing	Continuing	Continuing
Prior year cost no longer funded in the FYDP	Various	Various : Various	44.016	0.000		0.000		0.000		-		0.000	0.000	44.016	-
		Subtotal	223.772	0.000		0.000		28.066		-		28.066	Continuing	Continuing	N/A

Remarks

1. FY19 increase to Systems Engineering OFP at NAWCWD China Lake due to requirement for software improvements to the APKWS integration.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support - OFP	WR	FST Cherry Pt : Cherry Point, NC	0.080	0.000		0.000		0.100	Nov 2018	-		0.100	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development - RMP	C/CPFF	Boeing : St. Louis, MO	2.255	0.000		0.000		0.616	Jun 2019	-		0.616	2.146	5.017	5.017
Studies and Analysis - OFP	WR	NAWCWD : China Lake, CA	0.881	0.000		0.000		0.234	Nov 2018	-		0.234	Continuing	Continuing	Continuing
Studies and Analysis - RMP	C/FFP	Boeing : St. Louis, MO	4.962	0.000		0.000		0.500	Jul 2019	-		0.500	3.090	8.552	8.552
Studies and Analysis - OFP	C/FFP	Boeing : St. Louis, MO	4.519	0.000		0.000		1.020	Jan 2019	-		1.020	0.000	5.539	5.539
Prior year cost no longer funded in the FYDP	Various	Various : Various	55.372	0.000		0.000		0.000		-		0.000	0.000	55.372	-
		Subtotal	68.069	0.000		0.000		2.470		-		2.470	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation - RMP	WR	NAWCWD : China Lake, CA	40.834	0.000		0.000		0.200	Jan 2019	-		0.200	Continuing	Continuing	Continuing
Developmental Test & Evaluation - OFP	WR	NAWCWD : China Lake, CA	26.444	0.000		0.000		7.404	Jan 2019	-		7.404	Continuing	Continuing	Continuing
Developmental Test & Evaluation - OFP	C/CPFF	Raytheon : Waltham, MA	1.971	0.000		0.000		1.537	Apr 2019	-		1.537	0.000	3.508	3.508
Developmental Test & Evaluation - RMP	WR	FRC-E : Cherry Point, NC	0.293	0.000		0.000		0.200	Dec 2018	-		0.200	Continuing	Continuing	Continuing
Developmental Test & Evaluation - RMP/OFP	Various	Various : Various	0.100	0.000		0.000		0.100	Jan 2019	-		0.100	Continuing	Continuing	Continuing
Operational Test & Evaluation - OFP	WR	COMOPTEVFOR : Norfolk, VA	25.013	0.000		0.000		0.886	Jan 2019	-		0.886	Continuing	Continuing	Continuing
Operational Test & Evaluation - OFP	WR	NAWCAD : Patuxent River, MD	0.130	0.000		0.000		0.280	Dec 2018	-		0.280	Continuing	Continuing	Continuing
Prior year cost no longer funded in the FYDP	Various	Various : Various	12.727	0.000		0.000		0.000		-		0.000	0.000	12.727	-
		Subtotal	107.512	0.000		0.000		10.607		-		10.607	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

2. FY19 increase to DT&E OFP at NAWCAD China Lake due to increase in H7.0 AIM-9X testing. H7.0 test requirements increase in FY19 as the OFP progresses.
3. FY19 increase to DT&E OFP at Raytheon due to H7.0 AIM-9X testing.
4. FY19 increase to DT&E RMP at FRC-E Cherry Point due to anticipated testing of Outrigger Landing Gear improvements.
5. FY19 increase to OT&E OFP at COMOPTEVFOR due to integrated test for H7.0 OFP.
6. FY19 increase to OT&E OFP at NAWCAD Patuxent River necessary to conduct environmental testing on AIM-9X as part of H7.0 OFP.

Management Services ($ in Millions)

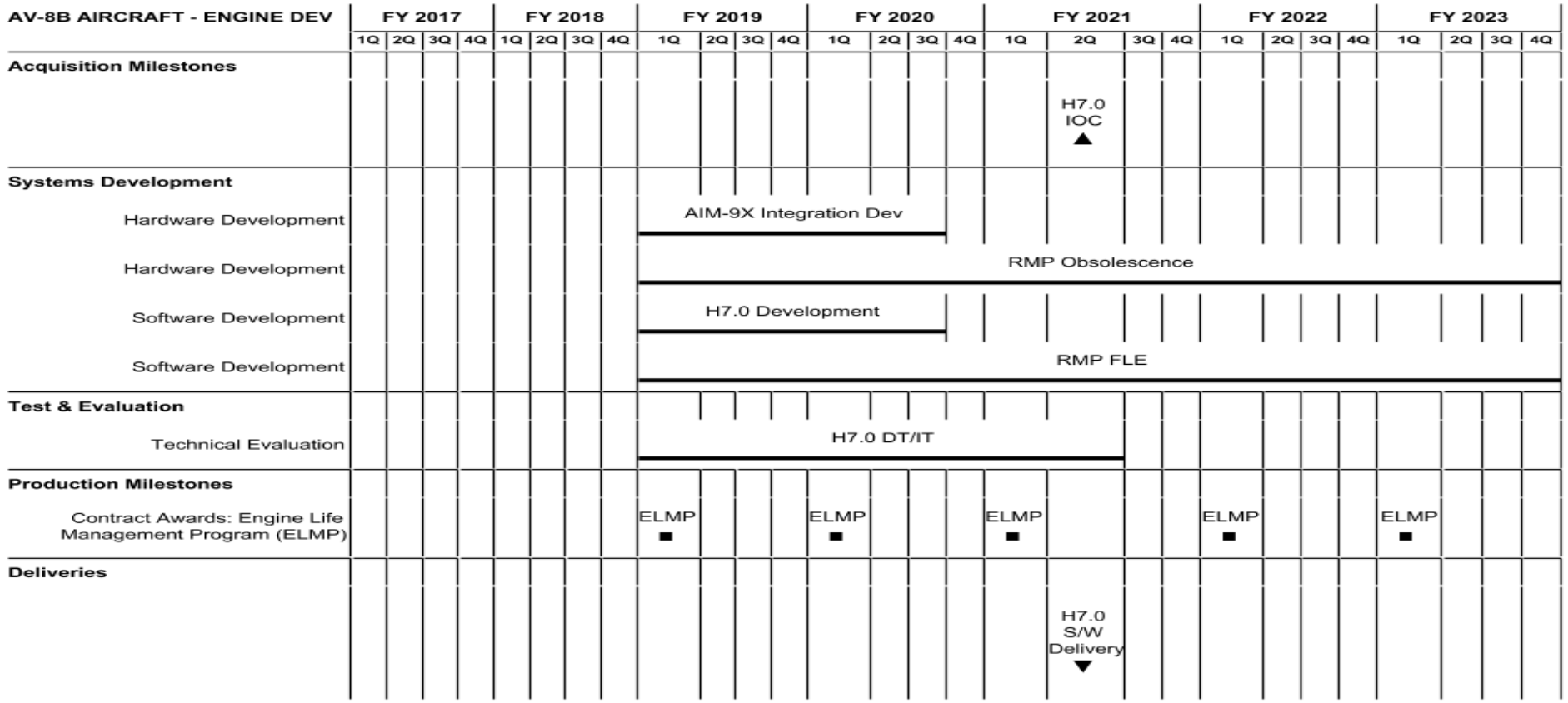
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Tec SRVC (Non-FFRDC) - RMP	C/CPFF	TDA : Falls Church, VA	1.301	0.000		0.000		0.275	Dec 2018	-		0.275	0.867	2.443	2.443
Engineering & Tec SRVC (Non-FFRDC) - ELMP	C/CPFF	Zenetex : Herndon, VA	5.231	0.000		0.000		1.185	Jun 2019	-		1.185	8.845	15.261	15.261
Engineering & Tec SRVC (Non-FFRDC)	C/CPFF	Various : Various	10.729	0.000		0.000		1.061	Dec 2018	-		1.061	7.926	19.716	19.716
Government Engineering Support - ELMP	WR	NAWCAD : Patuxent River, MD	10.055	0.000		0.000		1.071	Nov 2018	-		1.071	Continuing	Continuing	Continuing
Government Engineering Support - OFP	WR	NAWCAD : Patuxent River, MD	4.104	0.000		0.000		0.993	Nov 2018	-		0.993	Continuing	Continuing	Continuing
Government Engineering Support - ELMP	WR	NAWCWD : China Lake, CA	1.376	0.000		0.000		0.028	Dec 2018	-		0.028	Continuing	Continuing	Continuing
Government Engineering Support - OFP	Various	Various : Various	0.404	0.000		0.000		0.208	Jan 2019	-		0.208	Continuing	Continuing	Continuing
MGT & PROF SUPPT SRVC (NON-FFRDC)	C/CPFF	Various : Various	9.248	0.000		0.000		0.214	Dec 2018	-		0.214	12.064	21.526	21.526
Travel	WR	Various : Various	1.800	0.000		0.000		0.185	Oct 2018	-		0.185	Continuing	Continuing	Continuing
Prior year cost no longer funded in the FYDP	Various	Various : Various	16.769	0.000		0.000		0.000		-		0.000	0.000	16.769	-
		Subtotal	61.017	0.000		0.000		5.220		-		5.220	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214M / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	460.370	0.000		0.000		46.363		-		46.363	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214M / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*



2019PB - 0604214M - 0652

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214M / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AV-8B AIRCRAFT - ENGINE DEV				
Acquisition Milestones: H7.0 IOC	2	2021	2	2021
Systems Development: Hardware Development: AIM-9X Integration Development	1	2019	3	2020
Systems Development: Hardware Development: RMP Obsolescence Development	1	2019	4	2023
Systems Development: Software Development: H7.0 Development	1	2019	3	2020
Systems Development: Software Development: RMP Fatigue Life Expended Development	1	2019	4	2023
Test & Evaluation: Technical Evaluation: H7.0 Link 16 DT/IT	1	2019	2	2021
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY19	1	2019	1	2019
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY20	1	2020	1	2020
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY21	1	2021	1	2021
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY22	1	2022	1	2022
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY23	1	2023	1	2023
Deliveries: H7.0 S/W Delivery	2	2021	2	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604214N *I AV-8B Aircraft - Engine Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	379.411	32.179	48.780	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	460.370
0652: *AV-8B*	379.411	32.179	48.780	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	460.370

A. Mission Description and Budget Item Justification

The program provides for AV-8B Design, Development, Integration, and Test of various platform improvements such as: Engine Life Management Program (ELMP), Escape Systems, Joint Mission Planning System (JMPS), and Block upgrades to various mission systems and software, avionics and communications systems, navigation equipment, weapons carriage and countermeasures, and unique flight testing, and the Obsolescence Replacement (OR)/Readiness Management Plan (RMP) including structural, hydraulic, electrical, environmental, and mechanical systems. The JMPS is required as part of the Department of the Navy directed migration to a common Navy and Marine Corps mission planning system. OR/RMP represents all engineering activities for development and design to support aircraft safety flight clearances, concept explorations, responses to evolving threats, and developments to support Program Objective Memorandum. The program's Evolutionary Acquisition Strategy includes Design, Development, Integration, and Test activities under the consolidated effort of Block Developments: H6.1, H6.2 and follow-on block upgrades, to include a H7.0 block upgrade that will be required to implement full Link 16 capability and integrate AIM-9X. An H6.2 update, including the Common Avionics Program, provides AV-8B a self-contained Global Positioning System navigation capability that is required to access preferred airspaces, and will include a Litening Operational Flight Program (OFP) V3, and initial Link 16 Precise Participant Location and Identification capability, which will provide interoperability, digital combat identification and increase situational awareness on the battlefield. Link 16 is a Top 10 item in the Operational Advisory and Systems Safety Groups. AV-8B funding supports peculiar flight test requirements to include weapons integration/carriage and avionics and software/firmware upgrades. The H7.0 OFP will fully implement the Harrier Link 16 integration, which will provide information sharing capabilities and integration of an increased number of Link 16 messages and the ability to act on shared target track information. Connection to the Link 16 network is vital to the AV-8B's ability to operate within some Command and Control situations and Operational Plans, as designed today, as well as provide a tactical capability for the more effective and safe prosecution of both airborne and ground targets. Continued AV-8B combat relevance and ability to respond to evolving and emergent threats through end of service is critical to the Marine Air-Ground Task Force's ability to generate aviation combat power throughout the transition to F-35B. J-series, K-series, Tactical Targeting Network Technology, and other emerging datalink technology messages are required to support current and future mission threads. Linked performance on par with current tactical platforms as well as design to communicate with F-35 is required for the AV-8B to remain tactically relevant to transition. H7.0 will also include the integration and test of weapons and sensors such as AIM-9X and Litening OFP V4, and will integrate required Radar Display Computer processing improvements to enable H7.0 functionality. Additionally a Helmet Mounted Cueing System (HMCS), Unique Weapons and Countermeasures software integration and stores expansion testing will be required, to include Advanced Precision Kill Weapons System, AIM-9X, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and AIM-120 unique platform flight test which will be required to utilize updated AIM-120C variants on the AV-8B and utilize the AIM-120 in mixed stores loadouts, as well as test of emergent tactical requirements. The ELMP is a comprehensive plan to increase and maintain safety of flight and operational readiness of the AV-8B F402-RR-408 Engine and accessories. PMA-257 will accomplish this mission by conducting Engineering Project Description investigations to develop engineering solutions that address emergent safety, obsolescence, foreign object debris detection and prevention, fatigue life and maintenance issues. The OR/RMP is required to ensure the AV-8B air vehicle's sustained mission availability, and safe and reliable operational readiness until end of service. Air vehicle sustainment requires component and system analyses, technical planning, identification, prioritization, and diagnosis of emergent problems and the allocation of resources for the development, testing and flight clearance of engineering solutions in the areas of flight, crew safety, and escape systems and structural integrity, obsolescence, systems reliability and maintainability, inventory preservation, alternative mission development,

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604214N *I AV-8B Aircraft - Engine Dev*

or other emergent material or equipment conditions affecting AV-8B systems readiness. Activities include research/analysis for system safety deficiency corrections, fuel system safety improvements, structural analyses, monitoring and integrity analysis, component compatibility, component and materials obsolescence analyses and mitigation development, explorations for aging equipment, reliability improvement analyses and design developments. FY 2019 continues development efforts and associated obsolescence and readiness requirements for ELMP, RMP, Link 16, weapons and sensors carriage/integration, peculiar flight test and OFP updates.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	34.902	48.780	46.695	-	46.695
Current President's Budget	32.179	48.780	0.000	-	0.000
Total Adjustments	-2.723	0.000	-46.695	-	-46.695
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.485	0.000			
• Program Adjustments	-1.238	0.000	-48.468	-	-48.468
• Rate/Misc Adjustments	0.000	0.000	1.773	-	1.773
• Congressional Directed Reductions Adjustments	-1.000	-	-	-	-

Change Summary Explanation

Funds decrease from FY 2018 to FY 2019 due to transfer of effort to new PE 0604214M beginning in FY 2019.

Schedule:

H7.0 IOC, H7.0 DT/IT, H7.0 Software Delivery completion and AIM-9X Integration and H7.0 Development adjusted two quarters due to completion of H7.0 system requirement review and gaining greater understanding of software coding and test requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0652: *AV-8B*	379.411	32.179	48.780	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	460.370
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides for AV-8B Design, Development, Integration and Test of the following improvements: The Engine Life Management Program (ELMP), Operational Flight Program (OFP) and Avionics/Weapons Integration, Escape System, and Readiness Management Plan (RMP). The ELMP is a comprehensive plan to increase safety of flight and operational readiness of the AV-8B F402-RR-408 Engine and Gas Turbine Starter, as well as other critical engine components. The Program Office will accomplish this mission through the Component Improvement Program, which entails Engineering Project Description investigations to derive safety and reliability improvements to the engine and engine components. The Joint Mission Planning System is required as part of the Department of Navy directed migration to a common Navy and Marine Corps mission planning system. H6.2 provides Global Positioning System navigation capabilities, a Litening common OFP update and initial Link 16 capability to include use of the APX-123, initial Mode 5 capability, as well as software updates. H7.0 OFP will integrate full Harrier Link 16 capability and provide software updates. H7.0 will also integrate AIM-9X, a Litening Common OFP update, provide Advanced Precision Kill Weapon System (APKWS) integration improvements, Joint Standoff Weapons (JSOW), and common avionics ADS-B (out), Mode 5, and Mode S Identification Friend or Foe capabilities as well as integrate required Radar Display Computer processing improvements to enable H7.0 functionality. Other specific efforts include peculiar integration and flight test requirements such as AIM-120C flight test, as AIM-120A/B will become obsolete, as well as AIM-120 mixed stores flight test, unique weapons, sensors, and countermeasures integration and stores expansion to include APKWS, Helmet Mounted Cueing System (HMCS), AIM-9X, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and unique flight test of other avionics, sensors, or weapons systems , or emergent tactical requirements, as they arise. The program is working closely with the Common Avionics Program and the Allies (Spain and Italy) on all efforts. RMP represents all engineering activities for development, design and test to support aircraft safety, flight clearance and concept exploration for resolution of emergent safety, service life, escape systems, compatibility, obsolescence, and readiness issues as well as response to fleet urgent operational requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Development of RMP Engineering Change Proposals	7.270	10.294	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop obsolescence solutions to improve safety, structural integrity, and systems reliability of the AV-8B aircraft.					
FY 2018 Plans: Extension to AV-8B End of Service date requires continued obsolescence mitigation efforts to maintain aircraft readiness. The program will continue to address known, predicted, and emergent obsolescence equipment issues, continuing efforts from prior years. Continue fatigue life tracking analyses and algorithm update development. Continue system engineering analyses and design for GR-9 component compatibility. Continue					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
the development of Nose Landing Gear Door Redesign, Environmental Control System improvements, Outrigger Strut Positive Position Indication, and Oil Caution Light Redesign. Continue Fuselage Fatigue Life Assessment to assure continued safe operation of the aircraft through the end of service date. Begin Nose Landing Gear Taxi Light Improvement required for increased safety of flight and aviation related ground mishap avoidance. Systems engineering will support ongoing and emergent analysis and design/development/test efforts required to identify Engineering Change Proposal requirements to correct systems safety, structural integrity, compatibility, and readiness issues including efforts required to respond to evolving and emergent threats, mission systems, communications systems, navigation equipment, weapons carriage and countermeasures, structural, hydraulic, electrical, environmental, and mechanical systems. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $10.294M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.					
Title: Operational Flight Program (OFP) and Avionics Weapons Systems Development and Integration	19.090	32.674	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop, integrate, and test aircraft OFP updates, mission planning updates, Litening Pod software updates/capability expansions, support aircraft avionics development efforts, integrate and test unique weapons systems, sensors, and countermeasures such as AIM-120C, AIM-9X, Helmet Mounted Cueing System (HMCS), Advanced Precision Kill Weapon System, ALE-43, standoff weapons such as Joint Standoff Weapons (JSOW) and other weapons/avionics and sensor systems and emergent tactical requirements as they arise, perform stores expansion testing, and conduct Digital Interoperability (to include Link 16) development, integration, and test efforts. Evaluate future capability expansions via studies and analyses. ***FY 2018 Plans:*** Funds provided for future capability expansion studies and analyses efforts, efforts required to respond to evolving and emerging threats, peculiar flight test requirements to include various required weapons/ sensors/countermeasures/stores expansion integration and testing such as AIM-120, AIM-9X, ALE-43, JSOW, APKWS, and other weapons/avionics systems as they arise. Perform stores expansion testing. Complete H6.2					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
OFP software integration and integrated test period. Field H6.2 OFP. Continue H7.0 OFP/Link 16/AIM-9X requirements development and begin software integration effort. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $32.674M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.					
Title: F402-RR-408 Engine Safety and Reliability Enhancements	5.819	5.812	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Improve Safety and Reliability of the F402-RR-408 Engine for the AV-8B Harrier. ***FY 2018 Plans:*** The engineering CIP will conduct engineering investigations to develop ECPs for improvements and design solutions to correct deficiencies resulting from safety, obsolescence, foreign object debris (FOD) detection and prevention and structural fatigue for the engine and engine accessories, to maintain readiness and to meet mission requirements. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $5.812M from FY 2018 to FY 2019 a result of the realignment of 100% Blue In Support of Green (BISOG) accounts to "M" coded Program Elements.					
Accomplishments/Planned Programs Subtotals	32.179	48.780	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0514: *AV-8 Series*	56.275	43.555	58.577	-	58.577	42.082	33.948	37.866	38.647	91.978	1,721.898

Remarks

D. Acquisition Strategy

The Obsolescence Replacement (OR)/Readiness Management Plan (RMP) ensures the maximum readiness levels for the AV-8B Type/Model/Series by maintaining post production engineering and logistic support with the two Original Equipment Manufacturers (OEMs). RMP tracks readiness degraders, identifies and addresses obsolescence for non avionics systems, and identifies and addresses emerging in-service material developments related to ease of maintenance, safety, airframe life management and improved performance. The multi-disciplined team of program management, engineering, logistics, and financial personnel develop ECPs, Rapid Action Minor Engineering Changes, Interim Rapid Action Changes to publications, trainer and support equipment modifications necessary to maintain aircraft reliability and safety. The RMP additionally supports the constant improvement and analysis of fleet Fatigue Life Expended data to maximize aircraft structural life and to support the NAVAIR annual Structural Appraisal of Fatigue Effects report required by OPNAV. Funding for the Engine Life Management Program will be placed on a cost-type contract to Rolls-Royce to address safety of flight issues, top readiness degraders, engine removal and mission failure drivers in order to improve Fleet readiness and reduce cost of ownership of the F402-RR-408 and accessories. It is also developed to assess life management program issues and design fixes for any service revealed deficiencies. The program's Evolutionary Acquisition Strategy includes Design, Development, Integration and Test activity under the consolidated effort of Block Developments: H2.0, H4.0, H5.0, H6.0, H6.1, H6.2, H7.0 and following Operational Flight Programs. The development and integration of Joint Mission Planning System occurred concurrently with H2.0. H4.0 Block improvements included the Tactical Aircraft Moving Map Capability. H5.0 Block Upgrade provided Dual Mode Laser Guided Bomb, Litening Centerline/Station 4 (improvement of current weapons carriage capability). The H6.2 update is being accomplished in conjunction with the Common Avionics Program and provides a Global Positioning System Navigation capability for AV-8B, a Litening Common Operational Flight Program update, initial Link 16 capability to include the use of APX-123 and initial Mode 5 functionality. Full Harrier Link 16 integration will require an H7.0 Operational Flight Program subsequent to H6.2 and will provide the AV-8B the Link 16 capability. H7.0 will also be accomplished in conjunction with Common Avionics Program and will integrate AIM-9X, ADS-B (out), Mode 5, Mode S and Advanced Precision Kill Weapon System (APKWS) integration improvements. Peculiar flight test efforts to include weapons, avionics, and sensors integration such as AIM-120, AIM-9X, APKWS, ALE-43, HMCS, standoff weapons such as Joint Standoff Weapons (JSOW), other avionics/weapons and sensors systems and emergent tactical requirements as they arise. Stores expansion efforts will be conducted by NAWCWD and AV-8B flight test squadrons in FY18.

E. Performance Metrics

Achieve Engine Life Management Program Rolls-Royce Component Improvement Program cost plus fixed fee contract award 1st Quarter FY 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - ELMP	C/CPFF	Rolls-Royce PLC : Bristol, GB	32.264	2.121	Dec 2016	1.802	Dec 2017	0.000		-		0.000	7.874	44.061	44.061
Primary Hardware Development - ELMP	C/FFP	ONTIC (Goodrich) PS : Pitstone, GB	6.061	0.220	Mar 2017	0.600	Mar 2018	0.000		-		0.000	1.980	8.861	8.861
Primary Hardware Development - OFP	WR	NAWCWD : China Lake, CA	49.586	7.423	Dec 2016	14.052	Dec 2017	0.000		-		0.000	0.000	71.061	-
Primary Hardware Development - OFP	C/FFP	Boeing : St. Louis, MO	5.437	2.340	Dec 2016	3.000	Dec 2017	0.000		-		0.000	6.419	17.196	17.196
Primary Hardware Development - OFP	C/CPFF	Raytheon : Waltham, MA	0.000	0.700	Apr 2017	3.750	Dec 2017	0.000		-		0.000	7.398	11.848	11.848
Systems Engineering - RMP	C/FFP	Boeing : St. Louis, MO	28.633	2.765	Jan 2017	5.172	Jan 2018	0.000		-		0.000	19.062	55.632	55.632
Systems Engineering - RMP	WR	NAWCWD : China Lake, CA	3.569	0.092	Nov 2016	0.094	Nov 2017	0.000		-		0.000	0.000	3.755	-
Systems Engineering - RMP	WR	NAWCAD : Patuxent River, MD	7.147	0.641	Nov 2016	1.450	Nov 2017	0.000		-		0.000	0.000	9.238	-
Systems Engineering - OFP	WR	NAWCWD : China Lake, CA	0.000	0.099	Aug 2017	0.738	Nov 2017	0.000		-		0.000	0.000	0.837	-
Systems Engineering - OFP	TBD	TBD : TBD	0.000	0.000		0.051	Dec 2017	0.000		-		0.000	0.000	0.051	-
Prior year cost no longer funded in the FYDP	Various	Various : Various	43.965	0.000		0.000		0.000		-		0.000	0.000	43.965	-
		Subtotal	176.662	16.401		30.709		0.000		-		0.000	42.733	266.505	N/A

Remarks

1. FY18 increase from PB18 to Primary Hardware Development OFP at Boeing due to AIM-9X integration. This effort began in 4Q/FY17 and continues for the full fiscal year in FY18.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support - OFP	WR	FST Cherry Pt : Cherry Point, NC	0.000	0.000		0.080	Nov 2017	0.000		-		0.000	0.000	0.080	-
Software Development - RMP	C/CPFF	Boeing : St. Louis, MO	0.825	0.825	Jun 2017	0.605	Jun 2018	0.000		-		0.000	2.762	5.017	5.017
Studies and Analysis - OFP	WR	NAWCWD : China Lake, CA	0.420	0.229	Nov 2016	0.232	Nov 2017	0.000		-		0.000	0.000	0.881	-
Studies and Analysis - RMP	WR	NAWCAD : Patuxent River, MD	0.000	0.126	Mar 2017	0.000		0.000		-		0.000	0.000	0.126	-
Studies and Analysis - RMP	C/FFP	Boeing : St. Louis, MO	0.850	2.372	Jul 2017	1.740	Jul 2018	0.000		-		0.000	3.590	8.552	8.552
Studies and Analysis - OFP	C/FFP	Boeing : St. Louis, MO	3.519	0.000		1.000	Jan 2018	0.000		-		0.000	1.020	5.539	5.539
Prior year cost no longer funded in the FYDP	Various	Various : Various	55.246	0.000		0.000		0.000		-		0.000	0.000	55.246	-
		Subtotal	60.860	3.552		3.657		0.000		-		0.000	7.372	75.441	N/A

Remarks

2. FY18 increase from PB18 to Studies and Analysis RMP at Boeing due to continuation of the Fuselage Fatigue Life Assessment effort necessary to assure continued safe operation of the aircraft through the end of service date.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation - RMP	WR	NAWCWD : China Lake, CA	40.242	0.000		0.592	Jan 2018	0.000		-		0.000	0.000	40.834	-
Developmental Test & Evaluation - OFP	WR	NAWCWD : China Lake, CA	16.229	3.670	Jan 2017	6.545	Jan 2018	0.000		-		0.000	0.000	26.444	-
Developmental Test & Evaluation - OFP	C/CPFF	Boeing : St. Louis, MO	0.000	1.439	Apr 2017	0.360	Apr 2018	0.000		-		0.000	0.000	1.799	1.799
Developmental Test & Evaluation - OFP	C/CPFF	Raytheon : Waltham, MA	0.000	1.266	Apr 2017	0.705	Apr 2018	0.000		-		0.000	1.537	3.508	3.508

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation - RMP	WR	FRC-E : Cherry Point, NC	0.193	0.000		0.100	Dec 2017	0.000		-		0.000	0.000	0.293	-
Developmental Test & Evaluation - RMP/OFP	Various	Various : Various	0.000	0.000		0.100	Jan 2018	0.000		-		0.000	0.000	0.100	-
Operational Test & Evaluation - OFP	WR	COMOPTEVFOR : Norfolk, VA	23.495	0.755	Jan 2017	0.762	Jan 2018	0.000		-		0.000	0.000	25.012	-
Operational Test & Evaluation - OFP	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.130	Dec 2017	0.000		-		0.000	0.000	0.130	-
Prior year cost no longer funded in the FYDP	Various	Various : Various	10.929	0.000		0.000		0.000		-		0.000	0.000	10.929	-
		Subtotal	91.088	7.130		9.294		0.000		-		0.000	1.537	109.049	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Tec SRVC (Non-FFRDC) - RMP	C/CPFF	TDA : Falls Church, VA	0.766	0.265	Dec 2016	0.270	Dec 2017	0.000		-		0.000	1.142	2.443	2.443
Engineering & Tec SRVC (Non-FFRDC) - ELMP	C/CPFF	Zenetex : Herndon, VA	2.851	1.218	Jun 2017	1.162	Jun 2018	0.000		-		0.000	10.030	15.261	15.261
Engineering & Tec SRVC (Non-FFRDC)	C/CPFF	Various : Various	8.614	1.074	Dec 2016	1.041	Dec 2017	0.000		-		0.000	8.987	19.716	19.716
Government Engineering Support - ELMP	WR	NAWCAD : Patuxent River, MD	7.969	1.034	Nov 2016	1.052	Nov 2017	0.000		-		0.000	0.000	10.055	-
Government Engineering Support - OFP	WR	NAWCAD : Patuxent River, MD	2.252	0.878	Nov 2016	0.974	Nov 2017	0.000		-		0.000	0.000	4.104	-
Government Engineering Support - ELMP	WR	NAWCWD : China Lake, CA	1.321	0.027	Dec 2016	0.028	Dec 2017	0.000		-		0.000	0.000	1.376	-
Government Engineering Support - OFP	Various	Various : Various	0.000	0.200	Jan 2017	0.204	Jan 2018	0.000		-		0.000	0.000	0.404	-
MGT & PROF SUPPT SRVC (NON-FFRDC)	C/CPFF	Various : Various	8.834	0.205	Dec 2016	0.209	Dec 2017	0.000		-		0.000	12.278	21.526	21.526
Travel	WR	Various : Various	1.425	0.195	Oct 2016	0.180	Oct 2017	0.000		-		0.000	0.000	1.800	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604214N / *AV-8B Aircraft - Engine Dev*	Project (Number/Name) 0652 / *AV-8B*	

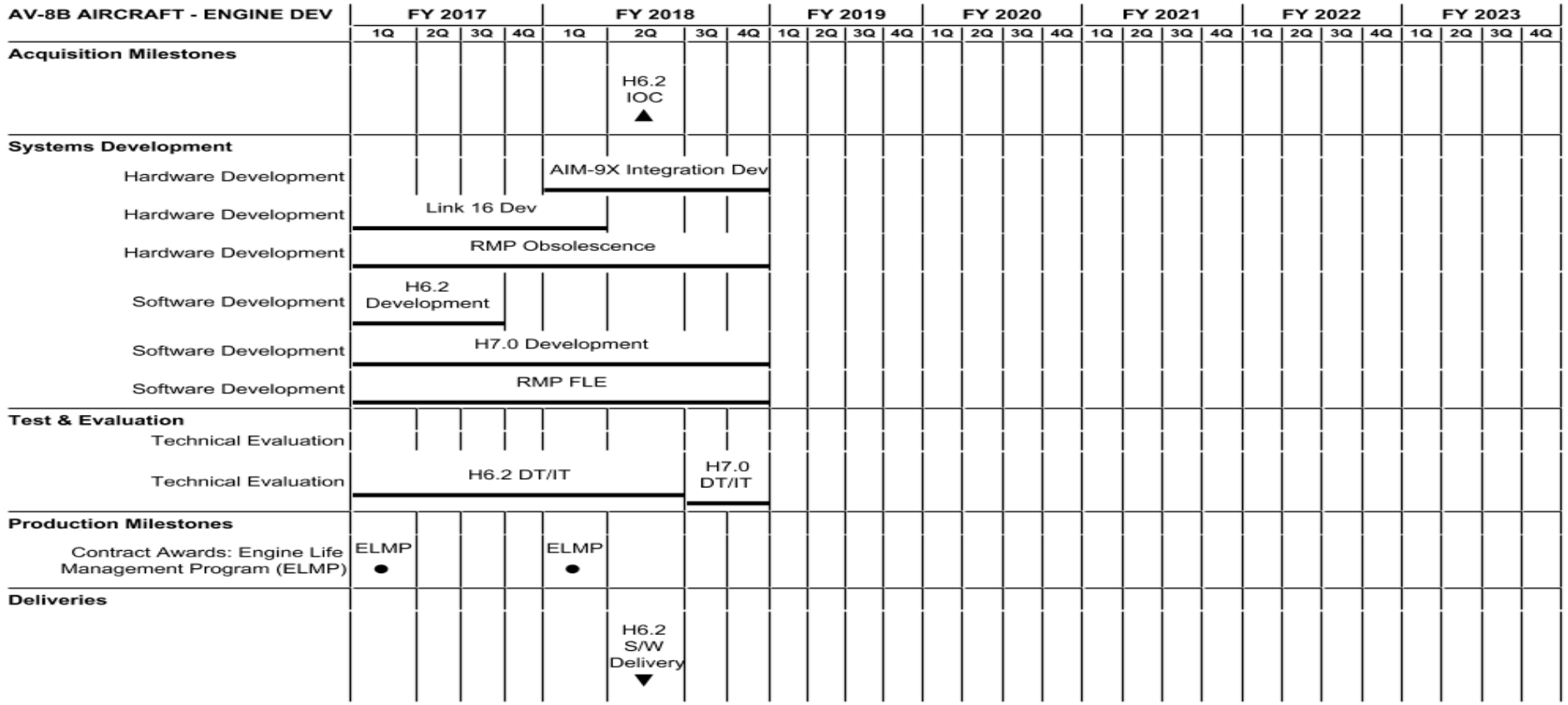
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year cost no longer funded in the FYDP	Various	Various : Various	16.769	0.000		0.000		0.000		-		0.000	0.000	16.769	-
		Subtotal	50.801	5.096		5.120		0.000		-		0.000	32.437	93.454	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	379.411	32.179		48.780		0.000		-		0.000	84.079	544.449	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*



2019PB - 0604214N - 0652

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604214N / *AV-8B Aircraft - Engine Dev*	**Project (Number/Name)** 0652 / *AV-8B*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AV-8B AIRCRAFT - ENGINE DEV				
Acquisition Milestones: H6.2 IOC	2	2018	2	2018
Systems Development: Hardware Development: AIM-9X Integration Development	1	2018	4	2018
Systems Development: Hardware Development: Link 16 Development	1	2017	1	2018
Systems Development: Hardware Development: RMP Obsolescence Development	1	2017	4	2018
Systems Development: Software Development: H6.2 Development	1	2017	3	2017
Systems Development: Software Development: H7.0 Development	1	2017	4	2018
Systems Development: Software Development: RMP Fatigue Life Expended Development	1	2017	4	2018
Test & Evaluation: Technical Evaluation: H6.2 DT/IT	1	2017	2	2018
Test & Evaluation: Technical Evaluation: H7.0 Link 16 DT/IT	3	2018	4	2018
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY17	1	2017	1	2017
Production Milestones: Contract Awards: Engine Life Management Program (ELMP): ELMP Contract Award FY18	1	2018	1	2018
Deliveries: H6.2 S/W Delivery	2	2018	2	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604215N *I Standards Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	15.799	1.300	2.722	3.771	-	3.771	3.704	4.284	4.278	4.365	Continuing	Continuing
1857: *Calibration Standards*	15.799	1.300	2.722	3.771	-	3.771	3.704	4.284	4.278	4.365	Continuing	Continuing

Note

Starting in FY17 the Common Helicopters (PU 2312) and Stores Planning and Weaponeering Module (PU 2311) will be moved to Mission Planning PE (0605215N). Starting in FY17 the JT Service/NV Std Avionics CP/SB (PU 0572) PE (0604215N) will be moved to a new Common Avionics PE (0605217N).

A. Mission Description and Budget Item Justification

This project provides for the identification, study, design, development, demonstration, test, evaluation, and qualification of standard avionics capabilities for Navy use, and wherever practicable, use across all Services and Foreign Military Sales. Such air combat electronics developments include communications and airborne networking, navigation and sensors, flight avionics, safety systems, and flight mission information systems for both forward fit and retrofit aircraft. These efforts continue to maintain federated systems while encouraging transition of procurements to support a modular system for enhanced performance and affordability. Consideration is given up front to reduce acquisition costs through larger procurement quantities that satisfy multi-aircraft customer requirements and that reduce life cycle costs in the areas of reliability, maintainability, and training. This project also provides a Navy-wide program to develop required calibration standards (hardware) in all major measurement technology areas in support of Navy Hull, Mechanical and Electrical (HM&E) systems as well as Navy Weapons systems, ground and air, throughout the Fleet. It funds Navy lead-service responsibilities in the Department of Defense and Joint Services Metrology Research and Development program. This project supports the military requirement to verify the performance of all test systems used to validate the operation of HM&E as well as Navy Weapon Systems with calibration standards traceable to the National Institute of Standards and Technology.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604215N *I Standards Development*			
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	1.300	2.722	2.772	-	2.772
Current President's Budget	1.300	2.722	3.771	-	3.771
Total Adjustments	0.000	0.000	0.999	-	0.999
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	0.999	-	0.999

Change Summary Explanation

Technical: Not applicable.

Schedule:

0572:
Tactical Communications: Title corrected from Joint Precision Approach Landing System Software (S/W) Integration to Operation Flight Plan S/W Integration.

Ground Proximity Warning Systems/Terrain Awareness Warning System (GPWS/TAWS II): H-60 TAWS II Software Development extended duration from 4Q/15 through 4Q/16 based on projected platform integration schedule.

Military Flight Quality Assurance: Test and Evaluation, MH-53R/S, M/CH-53E, AH-1Z, UH-1Y, Phase 2 Test extended from 3Q/15 to 4Q/15 due to longer testing required for a number of defects found. Phase 2 Test Readiness Review moved from 1Q/15 to 3Q/15 due to integration test took longer than planned due to number of defects found. Deliveries for H-60R/S, CH-53E, AH-1Z and UH-1Y reflect new date of 2Q/15 to align with F/A-18 procurement order.

"Mid Air Collision Avoidance Capability: Re-planned FY16-FY21 program as a result of the Business Case Analysis to properly aligned program. Material Development Decision/Acquisition Strategy Review (MDD/ASR) moved from 2Q/16 to 1Q/17. Added Capability Development Document (CDD) Draft added in 4Q16. Added Requirements Development from 1Q/16 to 4Q/16.

Starting in FY17 the JT Service/NV Std Avionics CP/SB (PU 0572) PE (0604215N) will be moved to a new Common Avionics PE (0605217N).

2311:

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604215N *I Standards Development*

WASP V4.0 Systems Development start was delayed from 4Q16 to 2017 and will be displayed under PE 0605215N.

WASP V3.2 IOC was delayed from 1Q16 to 3Q16 due to the asynchronous release process and requirement for a new build prior to IOC.

FY17 and out schedule is included in the Mission Planning PE 0605215N.

2312:
Common Helicopters schedule FY17 and out is included in Mission Planning PE 0605215N.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604215N / *Standards Development*	Project (Number/Name) 1857 / *Calibration Standards*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1857: *Calibration Standards*	15.799	1.300	2.722	3.771	-	3.771	3.704	4.284	4.278	4.365	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

OPNAV sponsored (by instruction), Navy-wide program which addresses Metrology related RDT&E issues for navy weapon systems, shipboard platforms, Naval Air, and Fleet Ground Marines. It supports development of calibration standards (equipment, procedures and technical data) required to resolve Metcal related safety, obsolescence, new and emerging technology support and cost reduction issues. It funds Navy unique and lead service responsibilities in DoD and Joint Services Metrology Research Programs to develop calibration solutions. The line supports development of measurement requirements to verify performance of all test systems used to validate the operation of Navy weapon Systems with calibration standards traceable to the National Institute of Standards and Technology to calibrate, sustain and ensure performance accuracy.

This program also provides benefits and efficiencies in a joint collaborative environment within the Tri-Services. Projects are identified and defined so that they will meet the universal requirement. Development efforts are integrated in order to achieve the common capabilities required at minimum cost. This is also a regular and common business practice within the Navy Metrology Community where R&D efforts are communicated and integrated into the multiple testing and Monitoring Systems. This is done in support of Program Managers, Sponsors, and Principle Executive officers. As a result, common requirements are established, duplication of efforts are eliminated, and best value, high quality Metcal products are produced for the Navy.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Calibration Standards	1.300	2.722	3.771	0.000	3.771
Articles:	-	-	-	-	-
FY 2018 Plans: ($0.743M) Continue development of (1) calibration hardware standard in physical mechanical measurement technology to support combat/operational readiness for submarine periscopes magnetic locks and aircraft tail hook non-destructive testing. ($0.670M) Finish development and transition (3) calibration hardware standards and in electro optical measurement technology to support shipboard readiness of weapon system communication to missile launch systems, combat/operational readiness, and safety of flight and operational readiness. ($0.635M) Begin development of (1) calibration hardware standard in electrical/electronic, measurement technology to support shipboard/submarine safety, and operational readiness.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604215N / *Standards Development*	**Project (Number/Name)** 1857 / *Calibration Standards*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
($0.389M) Finish development and transition of (1) and begin development of (1) calibration hardware standard for Chemical/Biological technology to support safety of flight, operational readiness and CFC-113 Freon removal (treaty compliance), shipboard and flight safety, and Divers Life Support Systems (DLSS). ($0.285M) Finish development and transition (1) and continue development of (1) calibration standard in analytical and metrology bench top technology to support equipment operational readiness for both air and sea-based operations. ***FY 2019 Base Plans:*** ($1.350M) Continue development of (1) calibration hardware standard in physical mechanical measurement technology to support combat/operational readiness for submarine periscopes magnetic locks and aircraft tail hook non-destructive testing. ($0.940M) Begin development of (2) calibration hardware standards and in electro optical measurement technology to support shipboard readiness of weapon system communication to missile launch systems, and combat/operational readiness. ($0.573M) Continue development of (1) calibration hardware standard in electrical/electronic, measurement technology to support shipboard/submarine safety, and operational readiness. ($0.532M) Finish development and transition of (1) calibration hardware standard for Chemical/Biological technology to support shipboard and flight safety, and Divers Life Support Systems (DLSS). ($0.376M) Finish development and transition (1) calibration standard in analytical and metrology bench top technology to support equipment operational readiness for both air and sea-based operations. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase funding will enhance and accelerate the development and fielding of three Fleet capabilities; (a) Fiber Optic Return Loss Standards projects both single and double mode; (b) Nuclear Magnetic Resonance (NMR) capability to be used at the Navy Primary Standards Laboratory (NPSL)and; (c) ARC Fault Detector					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604215N / *Standards Development*	**Project (Number/Name)** 1857 / *Calibration Standards*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Test Equipment (AFDTE) will provide metrological and traceability support performance assurance to Arc Fault Detection (AFD) systems aboard submarines and aircraft carriers.					
Accomplishments/Planned Programs Subtotals	1.300	2.722	3.771	0.000	3.771

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Funds provide for in-service engineering initiation of metrology research and developmental efforts of unique non-commercial hardware standards in the development of six key thrust technological areas which correspond to Physical Mechanical, Electro-Optical, Analytical Metrology, Electrical/Electronic systems, Chembio Defense, Microwave/Millimeter wave. These standards will ensure measurement accuracy in advanced and emerging combat weapon systems and associated test equipment. These hardware test standards will also provide for cost effective and efficient system maintenance and calibration measurements that reduce wrong test decisions and will result in lower maintenance cost and higher system performance reliability.

E. Performance Metrics

The U.S. Navy Metrology RDT&E Program will transition and continue the research and development of 9 projects in progress of Electro Optical, Chemical/Biological, Physical Mechanical, Analytical Metrology, Electrical/Electronic, and technology areas for the purpose of ensuring measurement accuracy in new emerging technology measurement requirements of Navy weapon systems. Success measures will be articulated through program goals and a balance score card strategy system.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604215N / *Standards Development*	Project (Number/Name) 1857 / *Calibration Standards*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC Corona : Corona, CA	5.411	0.051	Mar 2017	0.048	Mar 2018	0.281	Mar 2019	-		0.281	Continuing	Continuing	Continuing
		Subtotal	5.411	0.051		0.048		0.281		-		0.281	Continuing	Continuing	N/A

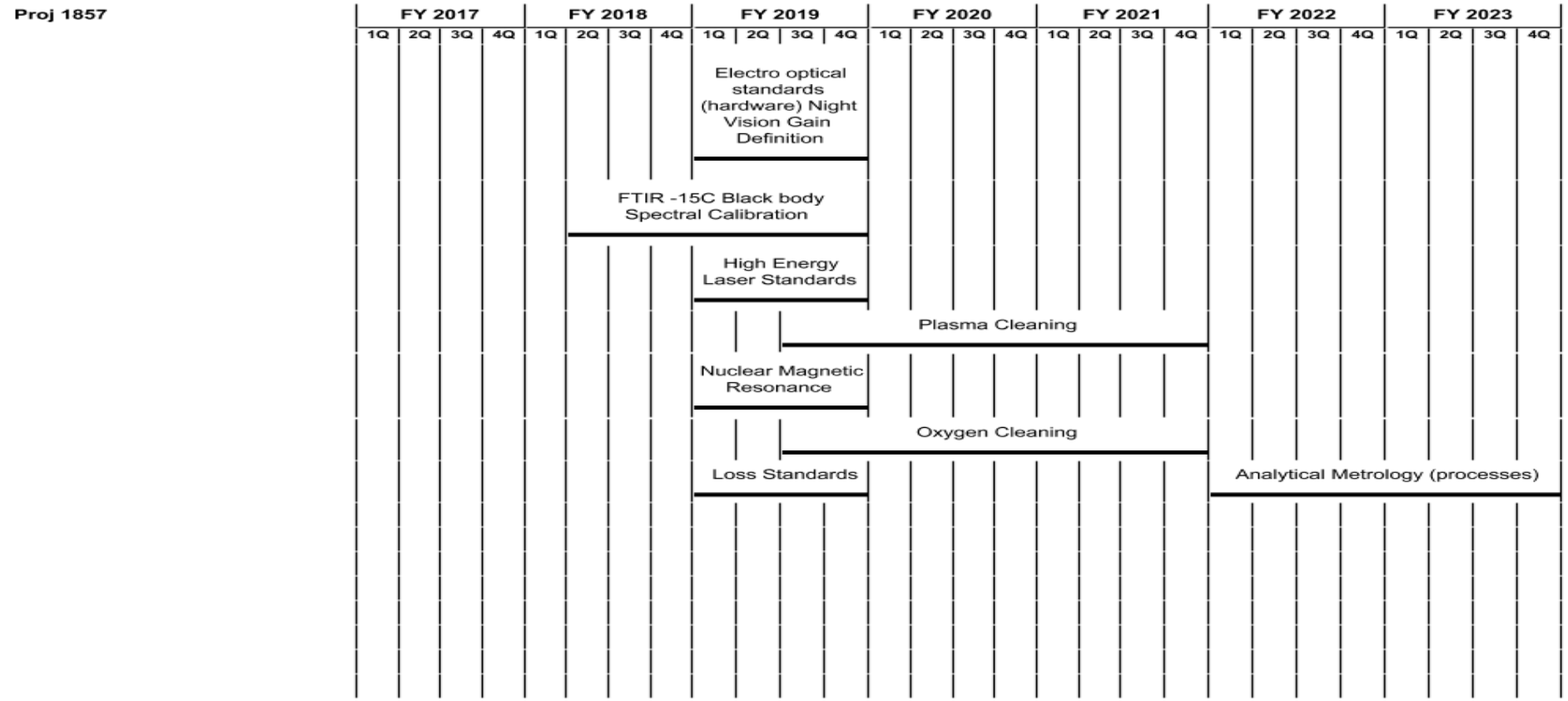
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	WR	NSWC Corona : Corona, CA	2.338	0.176	Mar 2017	0.176	Mar 2018	0.353	Mar 2019	-		0.353	0.000	3.043	-
Government Engineering Support	WR	NSWC Corona : Corona, CA	7.833	1.058	Mar 2017	2.483	Mar 2018	3.102	Mar 2019	-		3.102	0.000	14.476	-
Defense Acquisition Workforce	Various	Various : Various	0.007	0.000		0.000	Oct 2017	0.000		-		0.000	0.000	0.007	-
Travel	WR	NSWC Corona : Corona, CA	0.210	0.015	Mar 2017	0.015	Mar 2018	0.035	Mar 2019	-		0.035	0.000	0.275	-
		Subtotal	10.388	1.249		2.674		3.490		-		3.490	0.000	17.801	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.799	1.300		2.722		3.771		-		3.771	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604215N / *Standards Development*	**Project (Number/Name)** 1857 / *Calibration Standards*



2019DON - 0604215N - 1857

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604215N / *Standards Development*	**Project (Number/Name)** 1857 / *Calibration Standards*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1857				
Electro optical standards (hardware) Night Vision Gain Definition	1	2019	4	2019
Electro optical standards (hardware) FTIR -15C Black body Spectral Calibration	2	2018	4	2019
Electro optical Standards (hardware) development in High Energy Laser Standards	1	2019	4	2019
Physical Mechanical standards (hardware) development in Plasma Cleaning	3	2019	4	2021
Physical Mechanical standards (hardware) development in Nuclear Magnetic Resonance	1	2019	4	2019
Physical Mechanical standards (hardware) development in Oxygen Cleaning	3	2019	4	2021
Fiber Optic Return Loss Standards	1	2019	4	2019
Analytical Metrology (processes) Reliability Engineering Process Development for Initial Intervals	1	2020	4	2022
Schedule Detail	1	2019	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604216N *I Multi-Mssn Helicopter Upgrade Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,572.603	5.189	5.371	16.611	-	16.611	21.402	2.534	2.579	2.636	Continuing	Continuing
1707: *MH-60 Development*	1,572.603	5.189	5.371	16.611	-	16.611	21.402	2.534	2.579	2.636	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 191

A. Mission Description and Budget Item Justification

This Program Element includes funding for the development and improvement of MH-60R/S systems. MH-60R/S Multi-Mission helicopters provide both carrier and own-ship defense, and they greatly expand the capability of surface platforms through employment of onboard sensors and weapons systems. The MH-60R/S fleet is nearly 600 aircraft strong and serves as the world's premier multi-mission helicopter force. The MH-60R provides warfighting effectiveness in the primary mission areas of Anti-Submarine Warfare, Electronic Warfare, and Surface Warfare, including fast attack craft/fast in-shore attack craft (FAC/FIAC) threat response. Secondary MH-60R mission areas include search and rescue, vertical replenishment, naval surface fire support, logistics support, naval special warfare, strike warfare, personnel transport, and medical evacuation. The basic MH-60S conducts search and rescue, vertical replenishment, and logistics operations. Armed Helicopter and Airborne Mine Countermeasures (AMCM) have been added as primary mission areas for the MH-60S as block upgrades to the platform. Armed Helicopter upgrades provide Surface Warfare and Maritime Interdiction Operations capabilities to address FAC/FIAC threat, as well as Special Warfare Support and Combat Search and Rescue. AMCM provides the Littoral Combat Ship with the airborne portion of the Mine Countermeasures Mission Package. MH-60S secondary roles include torpedo and drone recovery, noncombatant evacuation operations, and SEAL team and Explosive Ordnance Disposal support.

The FY 2019 budget request funds the following efforts: System Configuration 20 which includes capability improvements including fuel management and integration of both the Advanced Offboard Electronic Warfare (AOEW) pod and Multifunction Information Distribution System-Low Volume Terminal (MIDS/LVT) Block Upgrade 2 terminal; development of Network Enabled Weapons capability which includes the integration of J11 and J12.6 series messages into the MH-60R/S Link-16 architecture. These messages enable the helicopter to provide in-flight target updates to Net Enabled Weapons, streamline target sorting, and expand over-the-horizon targeting capability for surface platforms; development of critical Aircraft Survivability Equipment (ASE) upgrades, specifically, platform design for the integration of a common ASE architecture; and developmental activities including capability studies, interoperability studies, aircraft service life evaluations, and open hardware and software architectures definition in support of MH-60 Mid-Life Upgrade.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604216N *I Multi-Mssn Helicopter Upgrade Dev*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	5.275	5.371	2.549	-	2.549
Current President's Budget	5.189	5.371	16.611	-	16.611
Total Adjustments	-0.086	0.000	14.062	-	14.062
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.086	0.000			
• Program Adjustments	0.000	0.000	14.200	-	14.200
• Rate/Misc Adjustments	0.000	0.000	-0.138	-	-0.138

Change Summary Explanation

FY 2019 increase of $14.200M for System Configuration 20, Network Enabled Weapons, Common ASE Architecture and Mid-Life Upgrade studies to include Cyber Evaluation/Validation and Radar Development activities that were not funded in the previous President's Budget.
Schedule: Updated for Network Enabled Weapons, Common ASE Architecture and delay of System Configuration 18 test efforts.
Technical: Not Applicable

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	Project (Number/Name) 1707 / *MH-60 Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1707: *MH-60 Development*	1,572.603	5.189	5.371	16.611	-	16.611	21.402	2.534	2.579	2.636	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 191

A. Mission Description and Budget Item Justification

The MH-60R/S program pursues upgrades and enhancements that pace the rapidly evolving threat and improve safety-of-flight for its pilots and aircrew. These efforts include improvements to existing sensors, avionics, communications, and navigation systems to include Identification Friend or Foe (IFF), the Multi-spectral Targeting System (MTS), the MH-60R radar equipped with Automatic Radar Periscope Detection and Discrimination (ARPDD), integration of the Joint Air-to-Ground Missile (obsolescence follow-on for Hellfire), the Sensor Operator Console, and MH-60R data-fusion capability. The program is also making incremental improvements to various airframe, flight safety, and mission-planning systems. VOR/ILS, on schedule be installed on MH-60R aircraft commencing in FY 2019, adds precision approach and airways-navigation capability to the MH-60R, and it greatly expands crews' ability to navigate in adverse weather. MH-60R is the lead platform for integration of the Multifunctional Information Distribution System (MIDS) / Low Volume Terminal (LVT) Block Upgrade 2 (an FAA and NSA mandate). MH-60R/S research and development initiatives include the evaluation and validation of the platform's cybersecurity posture. The MH-60R/S program is pursuing capability studies on open hardware and software architectures, avionics, mission systems, and air-vehicle kinematic performance. The program is also pursuing efforts in support of the MH-60 Mid-Life Upgrade.

The FY 2019 budget request funds the following efforts: System Configuration 20 which includes capability improvements including fuel management and integration of both the Advanced Offboard Electronic Warfare (AOEW) pod and MIDS/LVT Block Upgrade 2 terminal; development of Network Enabled Weapons capability which includes the integration of J11 and J12.6 series messages into the MH-60R/S Link-16 architecture. These messages enable the helicopter to provide in-flight target updates to Net Enabled Weapons, streamline target sorting, and expand over-the-horizon targeting capability for surface platforms; development of critical Aircraft Survivability Equipment (ASE) upgrades, specifically, platform design for the integration of a common ASE architecture; and developmental activities including capability studies, interoperability studies, aircraft service life evaluations, and open hardware and software architectures definition in support of MH-60 Mid-Life Upgrade.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Avionics H/W and S/W Development	0.855	2.010	9.010	0.000	9.010
Articles:	-	-	-	-	-
Description: Development efforts support aircraft integration, problem investigation, lab management and upgrades, and repairs in support of the test program. Avionics hardware and software development and integration to include: Pre-planned Product Improvements, new system configurations, radar enhancements, VOR/ILS, solutions to address the FAC/FIAC threat, development of Network Enabled Weapons capability					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	**Project (Number/Name)** 1707 / *MH-60 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
which includes the integration of J11 and J12.6 series messages into the MH-60R/S Link-16 architecture, and development of critical Aircraft Survivability Equipment (ASE) upgrades, and cyber evaluations/validations. ***FY 2018 Plans:*** Complete VOR/ILS and FAC/FIAC activities. Complete operational usage spectrum update to support fatigue life assessment of MH-60R aircraft structure and subsystem conditions. ***FY 2019 Base Plans:*** Commence activities for System Configuration 20 development which includes capability improvements for fuel management and safety, Advanced Offboard Electronic Warfare, and Multifunctional Information Distribution System Block Upgrade 2. Commence activities and award contract for the development of J11 and J12.6 series messages for network enabled weapon support, ASE upgrades, cyber evaluation/validation activities and radar enhancements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $7.000M from FY 2018 to FY 2019 is due to the increase of product development for Network Enabled Weapons capability, Common ASE architecture, cyber evaluation/validation activities, and radar enhancements.					
Title: Engineering and Logistics	1.432	1.702	2.650	0.000	2.650
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to provide MH-60 engineering specialists, integrated logistics support, government furnished equipment, support equipment, program management, contract support services, and travel to support VOR/ ILS, FAC/FIAC threat, and operational usage spectrum update efforts. Commence MH-60 Mid-Life Upgrade capability studies and develop initial open architectures, avionics, mission system, and air vehicle development cost and schedule planning estimates. Commence System Configuration 18 engineering support and finish FFFW/Rockets and mixed loads integration for Digital Rocket Launcher (DRL) on MH-60S. ***FY 2019 Base Plans:*** Continue to provide MH-60 engineering support, integrated logistics support, government furnished equipment, support equipment, program management, contract support services, and travel to support Mid-Life Upgrade					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	**Project (Number/Name)** 1707 / *MH-60 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
capability studies and initial open architectures, avionics, mission system, and air vehicle development cost and schedule planning estimates. This includes performing high-time aircraft teardowns and fatigue life research. Commence engineering support, integrated logistics support, government furnished equipment, support equipment, program management, contract support services, and travel to support System Configuration 20, ASE Common Architecture development and contract preparation, Network Enabled Weapons contract preparation and award, and radar enhancement efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.948M from FY 2018 to FY 2019 is due to the increase of systems engineering support for System Configuration 20, Network Enabled Weapons capability, Common Airborne Survivability Equipment architecture, and radar enhancements.					
Title: Test and Evaluation	2.902	1.659	4.951	0.000	4.951
Articles:	-	-	-	-	-
FY 2018 Plans: Commence System Configuration 18 test support and finish MH-60R VOR/ILS test and evaluation efforts. ***FY 2019 Base Plans:*** Complete System Configuration 18 and MH-60R VOR/ILS test and evaluation efforts. Commence System Configuration 20 test support. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $3.292M from FY 2018 to FY 2019 is due finalization of testing for System Configuration 18 and commencement of System Configuration 20 test activities.					
Accomplishments/Planned Programs Subtotals	5.189	5.371	16.611	0.000	16.611

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	**Project (Number/Name)** 1707 / *MH-60 Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN-5/0530: *SH60 Series*	122.900	110.715	130.661	4.858	135.519	156.874	168.347	127.694	128.416	Continuing	Continuing

Remarks

D. Acquisition Strategy

VOR/ILS will be developed using cost plus incentive fee type contracts.

E. Performance Metrics

Successfully support developmental and operation test activities to qualify aircraft modifications/upgrades.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	**Project (Number/Name)** 1707 / *MH-60 Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary SW Dev. Fast Attack Craft/Fast In-Shore Attack Craft (FAC/FIAC) demo	SS/BOA	Lockheed Martin : Owego, NY	5.556	0.037	Apr 2017	0.107	Apr 2018	0.000		-		0.000	0.000	5.700	5.700
Primary Hdw/SW Dev, Instrument Landing System	SS/CPFF	Lockheed Martin : Owego, NY	1.249	0.000		0.627	Mar 2018	0.000		-		0.000	0.000	1.876	1.876
Primary Hdw/SW Dev, Instrument Landing System	SS/CPIF	Sikorsky : Stratford, CT	1.808	0.000		0.592	Apr 2018	0.000		-		0.000	0.000	2.400	2.400
Primary HDW/SW Dev, Usage Spectrum Update	SS/CPIF	Sikorsky : Stratford, CT	0.000	0.000		0.684	Apr 2018	0.000		-		0.000	0.000	0.684	0.684
Prior year Product Dev Cost no longer funded in the FYDP	Various	Various : Various	1,165.791	0.000		0.000		0.000		-		0.000	0.000	1,165.791	-
System Configuration 20	SS/CPFF	Lockheed Martin : Owego, NY	0.000	0.000		0.000		0.110	Apr 2019	-		0.110	Continuing	Continuing	Continuing
Primary Hdw Dev, Avionics FFFW	MIPR	Army, DOTC : Picatinny, NJ	0.000	0.818	Jan 2017	0.000		0.000		-		0.000	0.000	0.818	-
Network Enabled Weapons	SS/CPFF	Lockheed Martin : Owego, NY	0.000	0.000		0.000		5.000	Mar 2019	-		5.000	11.000	16.000	16.000
Cyber Evaluation/ Validation	TBD	JHU/APL : Laurel, MD	0.000	0.000		0.000		0.600	Jan 2019	-		0.600	0.000	0.600	-
Common ASE Architecture	SS/CPFF	Lockheed Martin : Owego, NY	0.000	0.000		0.000		3.000	Apr 2019	-		3.000	5.000	8.000	8.000
Radar Development	TBD	JHU/APL : Laurel, MD	0.000	0.000		0.000		0.300	Jan 2019	-		0.300	0.000	0.300	-
		Subtotal	1,174.404	0.855		2.010		9.010		-		9.010	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	**Project (Number/Name)** 1707 / *MH-60 Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government eng spt, Very High Frequency Omni Ranging/Instrument Landing Sysem (VOR ILS)	Various	Various : Various	0.000	1.271	Dec 2016	0.250	Nov 2017	0.000		-		0.000	0.000	1.521	-
Government eng spt, Usage Spectrum Update	C/BA	TBD : TBD	0.000	0.000		0.920	Nov 2017	0.000		-		0.000	0.000	0.920	-
Prior year support cost no longer funded in the FYDP	Various	Various : Various	163.344	0.000		0.000		0.000		-		0.000	0.000	163.344	-
MH-60S Forward Firing Weapons/Rockets Government Engineering Support	Various	Various : Various	0.000	0.107	Dec 2016	0.225	Dec 2017	0.000		-		0.000	0.000	0.332	-
Government Eng Support , System Configuration 18	Various	Various : Various	0.000	0.000		0.057	Nov 2017	0.200	Nov 2018	-		0.200	0.000	0.257	-
Government Eng Support, Mid-Life Upgrade	Various	Various : Various	0.000	0.000		0.200	Nov 2017	0.600	Nov 2018	-		0.600	0.000	0.800	-
Government Eng Support, System Configuration 20	Various	Various : Various	0.000	0.000		0.000		0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
Government Eng Support, Net Enabled Weapons	Various	Various : Various	0.000	0.000		0.000		0.500	Nov 2018	-		0.500	0.000	0.500	-
Government Eng Support, Common ASE Architecture	Various	Various : Various	0.000	0.000		0.000		0.750	Nov 2018	-		0.750	0.000	0.750	-
Government Eng Support, Radar Dev	Various	Various : Various	0.000	0.000		0.000		0.300	Nov 2018	-		0.300	0.000	0.300	-
		Subtotal	163.344	1.378		1.652		2.600		-		2.600	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E),	WR	NAWC AD : Patuxent River, MD	167.898	0.572	Feb 2017	0.000		0.000		-		0.000	0.000	168.470	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	**Project (Number/Name)** 1707 / *MH-60 Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Projects commencing prior to FY16															
Operation Test & Evaluation (OT&E),Projects commencing prior to FY16	WR	COMOPTEVFOR : Norfolk, VA	15.445	0.004	Mar 2017	0.000		0.000		-		0.000	0.000	15.449	-
Developmental Test & Evaluation (DT&E), Very High Frequency Omni Ranging (VOR)/Instrument Landing System (ILS)	WR	NAWC AD : Patuxent River, MD	0.000	1.270	Feb 2017	0.020	Nov 2017	0.000		-		0.000	0.000	1.290	-
Prior year T&E costs no longer funded in the FYDP	Various	various : various	12.280	0.000		0.000		0.000		-		0.000	0.000	12.280	-
DT&E, System Configuration 18	Various	Various : Various	0.000	0.000		1.165	Nov 2017	0.800	Nov 2018	-		0.800	0.000	1.965	-
DT&E, MH-60S FFFW/ Rockets	Various	Various : Various	0.000	1.056	Mar 2017	0.474	Nov 2017	0.000		-		0.000	0.000	1.530	-
DT&E, System Configuration 20	WR	NAWC AD : Patuxent River, MD	0.000	0.000		0.000		4.151	Nov 2018	-		4.151	Continuing	Continuing	Continuing
		Subtotal	195.623	2.902		1.659		4.951		-		4.951	Continuing	Continuing	N/A

Management Services ($ in Millions)

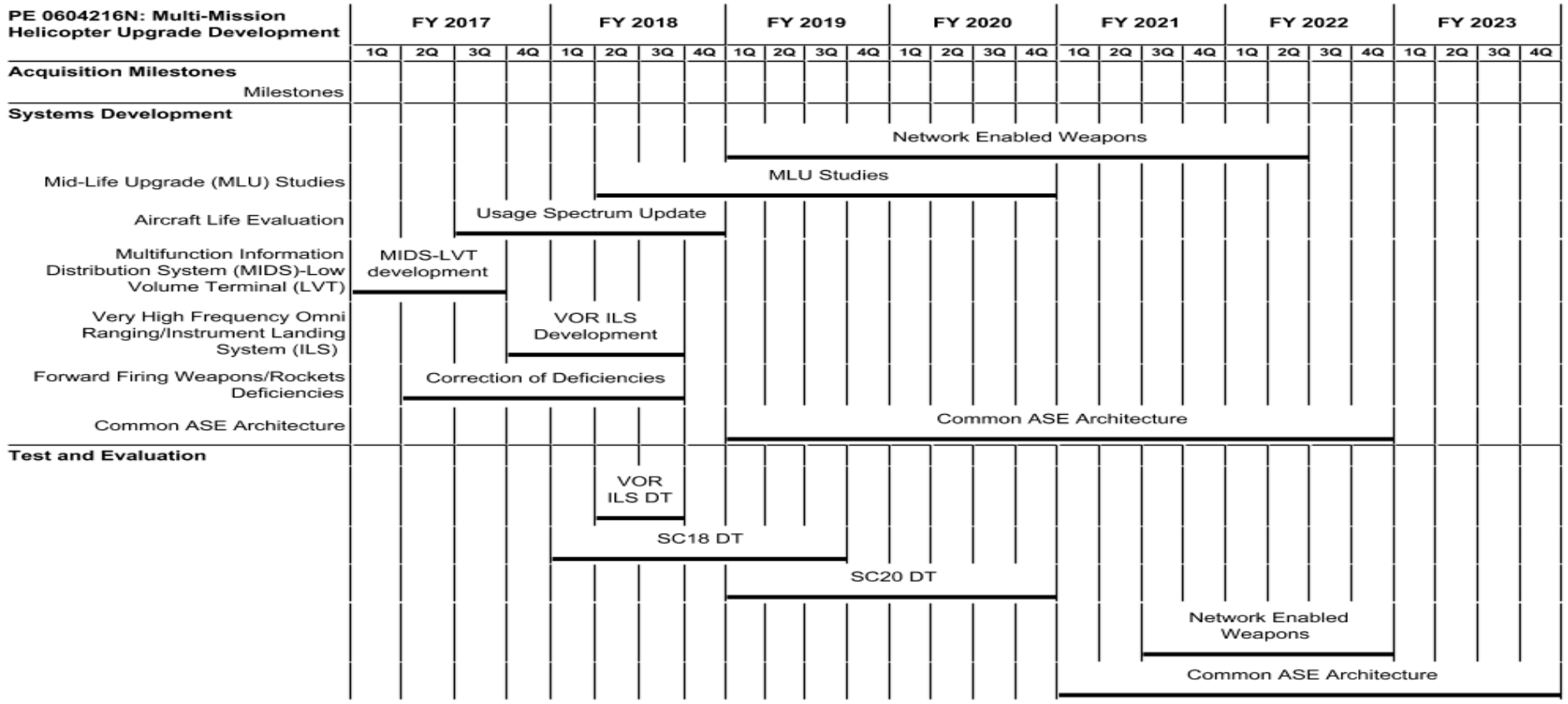
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAWC AD : Patuxent River, MD	4.976	0.054	Oct 2016	0.050	Nov 2017	0.050	Oct 2018	-		0.050	0.174	5.304	-
Prior year Mgmt Serv cost no longer funded in the FYDP	Various	Various : Various	34.256	0.000		0.000		0.000		-		0.000	0.000	34.256	-
		Subtotal	39.232	0.054		0.050		0.050		-		0.050	0.174	39.560	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	Project (Number/Name) 1707 / *MH-60 Development*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,572.603	5.189		5.371		16.611		-		16.611	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	**Project (Number/Name)** 1707 / *MH-60 Development*



2019PB - 0604216N - 1707

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604216N / *Multi-Mssn Helicopter Upgrade Dev*	**Project (Number/Name)** 1707 / *MH-60 Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PE 0604216N: Multi-Mission Helicopter Upgrade Development				
Systems Development: Network Enabled Weapons	1	2019	2	2022
Systems Development: Mid-Life Upgrade (MLU) Studies: MLU Studies	2	2018	4	2020
Systems Development: Aircraft Service-Life Evaluation: Usage Spectrum Update	3	2017	4	2018
Systems Development: Multifunction Information Distribution System (MIDS)-Low Volume Terminal (LVT): Block Upgrade 2 Integration	1	2017	3	2017
Systems Development: Very High Frequency Omni Ranging/Instrument Landing System (ILS): ILS integration	4	2017	3	2018
Systems Development: Forward Firing Weapons/Rockets Deficiencies: Correction of Deficiencies	2	2017	3	2018
Systems Development: Common ASE Architecture: Common ASE Architecture	1	2019	4	2022
Test and Evaluation: VOR ILS DT	2	2018	3	2018
Test and Evaluation: System Configuration 18 (SC18)	1	2018	3	2019
Test and Evaluation: System Configuration 20 (SC20)	1	2019	4	2020
Test and Evaluation: Integration and Testing of Network Enabled Weapons	3	2021	4	2022
Test and Evaluation: Integration and Testing of Common ASE Architecture	1	2021	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604218N *I Air/Ocean Equipment Engineering*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	250.699	3.747	0.782	17.368	-	17.368	22.433	18.958	18.666	21.377	Continuing	Continuing
2343: *Tactical METOC Applications*	153.449	0.000	0.000	11.054	-	11.054	14.630	14.590	14.203	14.487	Continuing	Continuing
2345: *Fleet METOC Equipment*	62.000	2.609	0.782	0.672	-	0.672	0.692	0.711	0.721	0.736	Continuing	Continuing
2346: *METOC Sensor Engineering*	23.745	1.138	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.883
2363: *Remote Sensing Capability Development*	11.505	0.000	0.000	5.642	-	5.642	7.111	3.657	3.742	6.154	Continuing	Continuing

Note

Total funding control for Fleet Meteorology & Oceanography (METOC) Equipment (2343) and Remote Sensing Capability Development (2363) in FY19 and beyond was moved from Program Element (PE) 0603207N AIR/OCEAN TACTICAL APPLICATIONS to PE 0604218N AIR/OCEAN EQUIPMENT ENGINEERING as a result of a Budget Activity (BA) reclassification.

A. Mission Description and Budget Item Justification

The Air/Ocean Equipment Engineering (AOEE) Program Element provides new capabilities to support naval combat forces. This program engineers and developmentally tests organic and remote sensors, communication interfaces, and processing and display devices. This equipment is engineered to measure, ingest, store, process, distribute and display conditions of the physical environment that are essential to the optimum employment and performance of naval warfare systems. AOEE also engineers capabilities for shipboard and shore-based tactical systems. A major area of focus for the AOEE program is to provide the engineering development of specialized equipment and measurement capabilities that are intended to monitor specific conditions of the physical environment in hostile and remote areas in response to fleet demand signals for increased sensing capability and capacity to support battlespace collections and prediction on short to intermediate time scales. With such capabilities, the war fighters' situational awareness of the operational effects of the physical environment are made more certain.

Major emphasis areas include the Naval Integrated Tactical Environmental System Next Generation (NITES-Next), Remote Sensing Capability Development and the Meteorological and Oceanographic Future Mission Capabilities (METOC FMC) project.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604218N *I Air/Ocean Equipment Engineering*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	3.875	0.782	0.690	-	0.690
Current President's Budget	3.747	0.782	17.368	-	17.368
Total Adjustments	-0.128	0.000	16.678	-	16.678
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.128	0.000			
• Program Adjustments	0.000	0.000	16.991	-	16.991
• Rate/Misc Adjustments	0.000	0.000	-0.313	-	-0.313

Change Summary Explanation

The FY 2019 funding request for Fleet METOC Equipment (2343) was reduced by $1.786 million to account for the availability of prior year execution balances.
$2 million increase in project 2363, Remote Sensing Capability Development, FY19 to develop SEAHORSE SURFACE SHIP DETECTION algorithms.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2343 / *Tactical METOC Applications*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2343: *Tactical METOC Applications*	153.449	0.000	0.000	11.054	-	11.054	14.630	14.590	14.203	14.487	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Total funding control for Fleet Meteorology & Oceanography (METOC) Equipment (2343) FY19 and beyond was moved from Program Element (PE) 0603207N AIR/ OCEAN TACTICAL APPLICATIONS to PE 0604218N AIR/OCEAN EQUIPMENT ENGINEERING as a result of a Budget Activity (BA) reclassification.

A. Mission Description and Budget Item Justification

The Tactical Meteorology and Oceanography (METOC) Applications Project provides cyber secure operational effects decision aid capabilities for Navy and Marine Corps warfighters in the context of Joint Operations in a net-centric environment. This project funds the agile software development of the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program of record. NITES-Next program identifies and transitions state-of-the-art decision support software technologies from the government and commercial industry's technology base, and then demonstrates and validates these capabilities before fielding. These software decision support tools provide platform, sensor, communications, and weapon systems performance assessments for warfighters in terms of their littoral and deep-strike battlespace environments. These assessments allow mission planners and warfighters, from Unit to Theater level, to optimize their sensor employment on airborne, surface, and subsurface platforms in support of Naval Composite Warfare mission areas including Undersea Warfare (USW), Anti-Submarine Warfare (ASW), Mine Warfare (MIW), Amphibious Warfare (AMW), Anti-Surface Warfare (ASUW), Anti-Air Warfare (AAW), Strike Warfare (STW), Expeditionary Warfare (EXW), Electronic Warfare (EW), Information Operations (IO), Intelligence Operations (INT), Non-Combat Operations (NCO), Command, Control, Communication (CCC), and Naval Special Warfare (NSW). Performance assessments leading to improvements in operational and tactical control are conducted through a two-tiered approach: 1) Meteorological and Oceanographic (METOC) Decision Aids and, 2) Operational Effects Decision Aids (OEDAs). METOC Decision Aides consist of a series of analysis tools which characterize the physical environment conditions of the battlespace based on the best set of physical environment data available at the time (i.e., some combination of historical and/or real-time (or near real-time) in-situ, and numerically modeled forecast data). OEDAs use the METOC Decision Aide information by fusing it with relevant, often-classified, sensor and target data to predict how weapons and sensor systems will perform. Performance results are displayed in tabular and graphic formats integrated into net-centric visualization tools for use by mission planners, and combat/weapon system operators to develop localization plans, USW/ AAW/ASUW screens, STW profiles, and AMW ingress and egress points. METOC Decision Aides and OEDAs typically use data derived from sensors developed in Project 2341 (METOC Data Acquisition) and assimilated by software produced by Project 2342 (METOC Data Assimilation and Modeling). METOC Decision Aides and OEDAs also use data obtained through direct interfaces to Navy combat systems. Cyber secure capabilities are a current emphasis required to characterize and/or predict sensor and weapons system performance in the highly complex littoral environments in support of regional conflict scenarios. It addresses multi-warfare areas, particularly shallow water ASW, NSW, and missile and air defense/strike capabilities.

FY 2019 request provides for NITES-Next to continue software development activities on the Fleet Capability Release (FCR)-2 (v2.0.2) and FCR-3 Task Orders in support of deployments. The program will plan for, and begin upgrading all ships (20+) and mobile variant platforms (450+) available. The program will prepare for Field

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

Technical Review (FTR), FCR-3 Fielding Decision (FD) and FCR-4 Build Decision (BD) in FY20. The NITES-Next program will continue to conduct Systems Integration Test (SIT) and System Qualification Testing (SQT) activities in support of the planned Consolidated Afloat Network and Enterprise Services (CANES) Application Integration (AI)/SIT and Developmental Test and Evaluation (DT&E) events. The program will continue planning for the FCR-4 development and contracting activities (including updating of all required documentation, Requirements Definition Package (RDP), Cost Analysis Requirements Document (CARD), Program Life Cycle Cost Estimate (PLCCE), Technology Readiness Assessment (TRA) Letter, Build Technical Review (BTR) and Authority to Operate (ATO)).

Funding supports development and integration efforts for Meteorological and Oceanographic (METOC) systems to generate and collect METOC data and fuse multiple intelligence inputs to more robustly characterize and predict tactical atmospheric and oceanographic conditions. This integrated METOC picture will support real-time battlespace awareness of propagation conditions affecting signals across the electromagnetic spectrum. METOC data will be fused with other intelligence data and automatically provided to shipboard combat systems to inform kinetic and non-kinetic fires.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Naval Integrated Tactical Environmental System Next Generation (NITES-Next)	0.000	0.000	11.054	0.000	11.054
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Naval Integrated Tactical Environmental System Next Generation (NITES-Next) will complete software development activities on the Fleet Capability Release (FCR)-2 (v2.0.2) and continue FCR-3 Task Orders in support of deployments. NITES-Next will complete initial software development of FCR 3 mobile variant which integrates new mobile requirements with the previous afloat version of FCR 2.x. The FCR-3 mobile variant software will also include anti-tamper proofing and will be releasable to our allies to enhance our interoperability with their information warfare systems. The new mobile variant will replace the current Naval Integrated Tactical Environmental System Fielded (NITES-Fielded) suite of systems that have been determined to have cyber vulnerabilities and need to be retired as soon as possible. The program will also begin planning for upgrade to all ships (20+) and mobile variant platforms (450+) available. The NITES-Next program will continue to conduct Systems Integration Test (SIT) and System Qualification Testing (SQT) activities in support of the planned Consolidated Afloat Network and Enterprise Services (CANES) Application Integration (AI)/SIT and Developmental Test and Evaluation (DT&E) events. Additionally, FCR-3 will include the development of an Electromagnetic (EM) Prediction capability to be delivered in FY19/20. The program will prepare for Field Technical Review (FTR), FCR-3 Fielding Decision (FD) and FCR-4 Build Decision (BD) in FY20. The program will continue planning for the FCR-4 development and contracting activities (including updating of all required documentation, Requirements Development Package (RDP), Cost Analysis Requirements Document (CARD),					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Program Life Cycle Cost Estimate (PLCCE), Technology Readiness Assessment (TRA) Letter, Build Technical Review (BTR) and Authority to Operate (ATO). The program will begin planning for FCR-5 development and contracting activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding reduction to account for the availability of prior year execution balances will not impact the program due to use of previous balances.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	11.054	0.000	11.054

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program acquisition, management and contracting strategies are to support the Tactical Meteorology & Oceanography (METOC) Applications project to continue the development of state-of-the-art software capabilities that provide sensor, communication, and weapon system performance assessment capabilities for open ocean and littoral operating environments. The Department of the Navy (DoN) maintains management oversight of the NITES-Next program's acquisition and contracting strategies. The Department of the Navy (DoN) requirements for the Naval Integrated Tactical Environmental System Next Generation (NITES-Next) program's acquisition and contracting strategies are based on approved Joint Capabilities Integration and Development System (JCIDS) documentation.

E. Performance Metrics

Goal: Field software decision aid capabilities for Navy and Marine Corps war fighters in order to facilitate the characterization and prediction of the physical environment in the battlespace.

Metric: Meet the performance metrics identified in approved NITES-Next Program's requirements documents (e.g., Concept Definition Document (CDD) and individual Requirements Definition Packages (RDPs)).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2343 / *Tactical METOC Applications*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NITES-Next	WR	SSC Pacific : San Diego, CA	19.734	0.000		0.000		2.695	Nov 2018	-		2.695	Continuing	Continuing	Continuing
NITES-Next	C/FP	SAIC : Virginia	7.444	0.000		0.000		2.145	Dec 2018	-		2.145	Continuing	Continuing	Continuing
NITES-Next	WR	SSC Atlantic : South Carolina	0.271	0.000		0.000		0.095	Oct 2018	-		0.095	Continuing	Continuing	Continuing
NITES-Next / Engineering	C/IDIQ	SSC Pacific : Various	0.000	0.000		0.000		4.050	May 2019	-		4.050	Continuing	Continuing	Continuing
Prodict Development Prior Year	Various	various : Various	117.115	0.000		0.000		0.000		-		0.000	0.000	117.115	-
		Subtotal	144.564	0.000		0.000		8.985		-		8.985	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Prior Year	Various	Various : Various	0.720	0.000		0.000		0.000		-		0.000	0.000	0.720	-
NITES-Next	C/FP	SAIC : Virginia	5.224	0.000		0.000		1.257	Dec 2018	-		1.257	Continuing	Continuing	Continuing
		Subtotal	5.944	0.000		0.000		1.257		-		1.257	Continuing	Continuing	N/A

Management Services ($ in Millions)

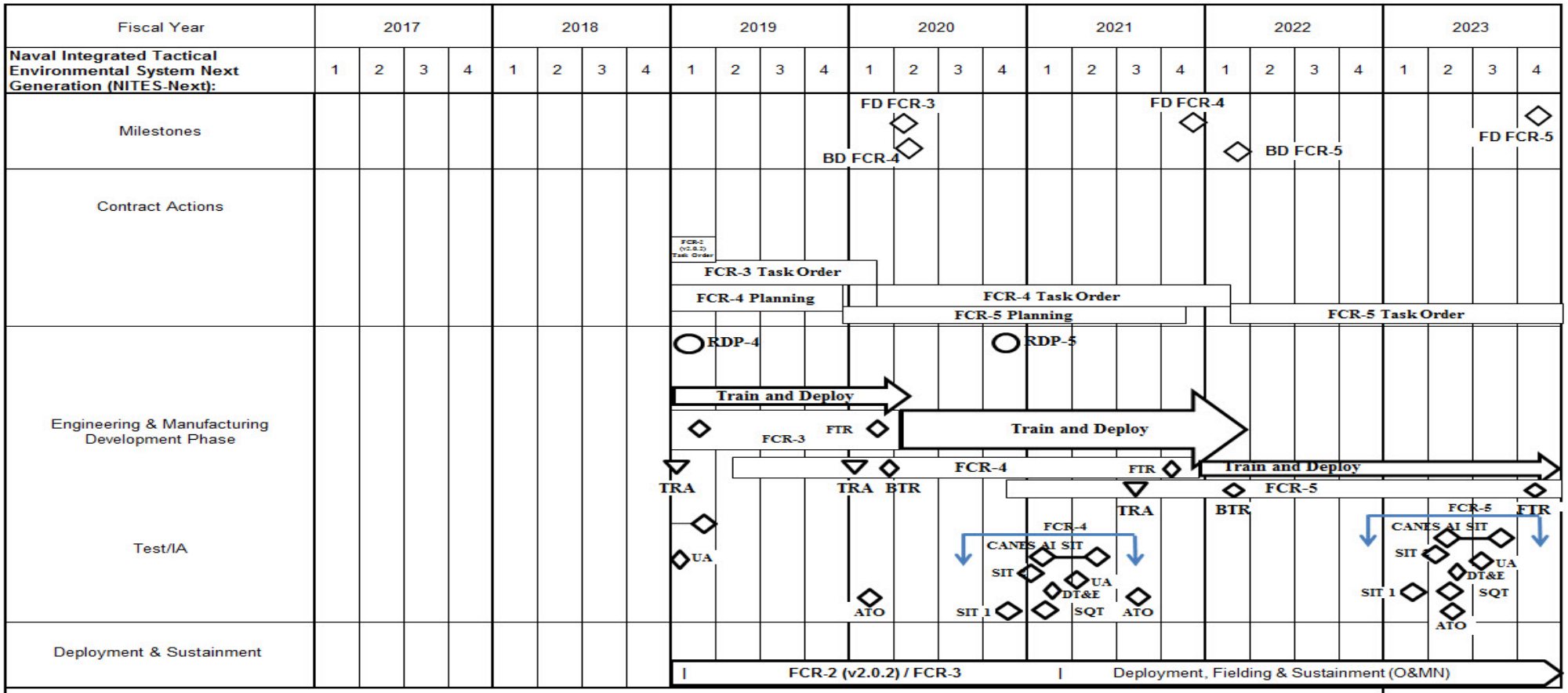
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services Prior Year	Various	Various : Various	0.031	0.000		0.000		0.000		-		0.000	0.000	0.031	-
NITES-Next	WR	SSC Pacific : San Diego, CA	1.140	0.000		0.000		0.309	Nov 2018	-		0.309	Continuing	Continuing	Continuing
NITES-Next	C/FP	BAH : Ssan Diego, CA	1.770	0.000		0.000		0.503	Dec 2018	-		0.503	Continuing	Continuing	Continuing
		Subtotal	2.941	0.000		0.000		0.812		-		0.812	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2343 / *Tactical METOC Applications*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	153.449	0.000		0.000		11.054		-		11.054	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*



Acronyms: OTRR = Opertional Test Readiness Review. RDP = Requirements Definition Package. FCR = Fleet Capability Release. TRA = Technology Readiness Assessment. BD = Build Decision. FD = Fielding Decision. Limited Fielding Decision = LFD. IOC= Initial Operational Capability. IATO = Interim Authority to Operate. ATO = Authority to Operate. UA = User Assessment. BTR = Build Technical Review. Field Technical Reivew = FTR. SIT = System Integration Test. RALOT = Risk Assessment Level of Testing. DT&E = Developmental Test & Evaluation. ADM - Acquisition Decision Memorandum. SOVT = System Verification Operational Test. CANES = Consolidated Afloat Networks and Enterprise Services. AI = Application Integration.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Naval Integrated Tactical Environmental System Next Generation (NITES-Next)				
Milestones: Build Decision (BD) Fleet Capability Release - 4	2	2020	2	2020
Milestones: Fielding Decision (FD) Fleet Capability Release - 3	2	2020	2	2020
Milestones: Fielding Decision (FD) Fleet Capability Release - 4	4	2021	4	2021
Milestones: Building Decision (BD) Fleet Capability Release - 5	1	2022	1	2022
Milestones: Fielding Decision (FD) Fleet Capability Release - 5	4	2023	4	2023
Contract Actions: FCR-2 Task Order (v2.0.2)	1	2019	1	2019
Contract Actions: FCR-3 Task Order	1	2019	1	2020
Contract Actions: FCR-4 Task Order	1	2020	1	2022
Contract Actions: FCR-4 Planning	1	2019	4	2019
Contract Actions: FCR-5 Planning	4	2019	4	2021
Contract Actions: FCR-5 Task Order	1	2022	4	2023
Engineering & Manufacturing Development Phase: Fleet Capability Release - 2 / Train Deploy	1	2019	2	2020
Engineering & Manufacturing Development Phase: Fleet Capability Release - 3 / Train Deploy	1	2019	1	2022
Engineering & Manufacturing Development Phase: Fleet Capability Release - 4 / Train and Deploy	2	2019	4	2023
Engineering & Manufacturing Development Phase: Fleet Capability Release - 5	4	2020	4	2023
Engineering & Manufacturing Development Phase: Requirements Definition Package - 4	1	2019	1	2019
Engineering & Manufacturing Development Phase: Requirements Definition Package - 5	4	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Engineering & Manufacturing Development Phase: Build Technical Review FCR-4	1	2020	1	2020
Engineering & Manufacturing Development Phase: Build Technical Review FCR-5	1	2022	1	2022
Engineering & Manufacturing Development Phase: Technology Readiness Assessment - 4	1	2020	1	2020
Engineering & Manufacturing Development Phase: Technology Readiness Assessment - 5	3	2021	3	2021
Engineering & Manufacturing Development Phase: Field Technical Review FCR-3	1	2020	1	2020
Engineering & Manufacturing Development Phase: Field Technical Review FCR-4	4	2021	4	2021
Engineering & Manufacturing Development Phase: Field Technical Review FCR-5	4	2023	4	2023
Test/IA: Fleet Capability Release - 3	1	2019	2	2019
Test/IA: Fleet Capability Release - 4	3	2020	3	2021
Test/IA: Fleet Capability Release - 5	4	2022	4	2023
Test/IA: System Integration Test - 1 (FCR-4)	4	2020	4	2020
Test/IA: System Integration Test - 2 (FCR4)	1	2021	1	2021
Test/IA: System Integration Test - 1 (FCR5)	1	2023	1	2023
Test/IA: System Integration Test - 2 (FCR5)	2	2023	2	2023
Test/IA: Authority to Operate FCR-3	1	2020	1	2020
Test/IA: Authority to Operate FCR-4	3	2021	3	2021
Test/IA: Authority to Operate FCR-5	2	2023	2	2023
Test/IA: System Qualification Test FCR-4	1	2021	1	2021
Test/IA: System Qualification Test FCR-5	2	2023	2	2023
Test/IA: Developmental Test Fleet Capability Release - FCR-4	1	2021	1	2021
Test/IA: Developmental Test Fleet Capability Release - FCR-5	2	2023	2	2023
Test/IA: User Assessment FCR-3	1	2019	1	2019
Test/IA: User Assessment FCR-4	2	2021	2	2021
Test/IA: User Assessment FCR-5	3	2023	3	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2343 / *Tactical METOC Applications*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test/IA: CANES AI SIT FCR-3	1	2019	1	2019
Test/IA: CANES AI SIT FCR-4	1	2021	2	2021
Test/IA: CANES AI SIT FCR-5	2	2023	3	2023
Deployment and Sustainment: Deployment, fielding and Sustainment (OMN)	1	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2345 / *Fleet METOC Equipment*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2345: *Fleet METOC Equipment*	62.000	2.609	0.782	0.672	-	0.672	0.692	0.711	0.721	0.736	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for the engineering and manufacturing development of sensors, communication interfaces, processing and display meteorological and oceanographic (METOC) equipment. This equipment is designed to provide future mission capabilities for war fighters to measure, ingest, store, process, distribute and display METOC parameters and derived products.

This project also exploits new government off-the-shelf /commercial off-the-shelf technologies, tactical sensors and web enablement for the Navy's computer-based tactical shipboard and shore capability used to predict and assess the operational effects of the physical environment on the performance of platforms, weapons and sensor systems. This project includes development of warfare specific mission planning modules to support unmanned systems with integration of data from environmental and tactical sensor systems, model forecast information and Geospatial Information & Services Databases. This project also supports development of autonomous environmental sensing systems for situational awareness and tactical decision aid/mission planner support, as well as iridium and advanced satellite communication integration in METOC sensor, vehicle control and mission planning systems that will be required to achieve Chief of Naval Operation objectives for information dominance and decision superiority.

Major emphasis areas include the Meteorological and Oceanographic Future Mission Capabilities (METOC FMC) project, Littoral Battlespace Sensors - Unmanned Undersea Vehicles (LBS-UUV) and the Environmental Satellite Receiver Processor (ESRP) (comprised of AN/SMQ-11 (sea and shore configuration) and AN/FMQ-17 (shore configuration)) program.

FY 2019 request provides for the Littoral Battlespace Sensors - Gliders (LBS-G), Littoral Battlespace Sensors - Autonomous Undersea Vehicles (LBS-AUV), and LBS-AUV(S) (Razorback) engineering design studies. Develop system upgrades via Engineering Change Proposals (ECP's) and correct any identified software and/or hardware deficiencies. Continue investigating next generation propulsion technologies such as Hybrid Thruster, battery chemistry, thermal engines, and universal buoyancy engines for potential system upgrades. Also, investigating battery technology, bio-fouling solutions, afterbody solutions, and open architecture approaches.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	0.388	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 OCO Plans:*** N/A					
Title: Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV)	1.956	0.463	0.358	0.000	0.358
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct LBS-G and LBS-AUV engineering design studies. Develop system upgrades via Engineering Change Proposals (ECP's) and correct any identified software and/or hardware deficiencies. Investigate next generation propulsion technologies such as Hybrid Thruster, battery chemistry, thermal engines, and universal buoyancy engines for potential system upgrades. ***FY 2019 Base Plans:*** Conduct LBS-G, LBS-AUV, and LBS-AUV(S) (Razorback) engineering design studies. Develop system upgrades via Engineering Change Proposals (ECP's) and correct any identified software and/or hardware deficiencies. Continue investigating next generation propulsion technologies such as Hybrid Thruster, battery chemistry, thermal engines, and universal buoyancy engines for potential system upgrades. Also, investigating battery technology, bio-fouling solutions, afterbody solutions, and open architecture approaches. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Reduction in funding from FY18 to FY19 will reduce the amount of investigating into next generation propulsion technologies such as Hybrid Thruster, battery chemistry, thermal engines, and universal buoyancy engines for potential system upgrades.					
Title: Environmental Satellite Receiver Processor (ESRP)	0.265	0.319	0.314	0.000	0.314
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to develop and test annual hardware and software upgrades to integrate new METOC Satellite Sensors available in the GOES and the POES. Continue integration of ESRP systems in support of Defense Weather Satellite System (DWSS), which has replaced JPSS, and EUMETSAT. Overall program efforts include					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
investigation of emerging technologies through study, development and associated testing for feasibility of program insertion. ***FY 2019 Base Plans:*** Continue to develop and test annual hardware and software upgrades to integrate new METOC Satellite Sensors available in the GOES and the POES. Continue integration of ESRP systems in support of Weather Satellite (WS) Follow-On (formerly known as Defense Weather Satellite System (DWSS), which replaced JPSS), and EUMETSAT. Overall program efforts include investigation of emerging technologies through study, development and associated testing for feasibility of program insertion. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY18 to FY19 reduces Other Direct Costs (ODCs) travel funding associated with hardware/ software upgrade testing not required in FY19.					
Accomplishments/Planned Programs Subtotals	2.609	0.782	0.672	0.000	0.672

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/4226: *Meteorological Equipment*	29.015	21.137	21.072	-	21.072	36.470	47.657	20.360	20.860	Continuing	Continuing
• RDTEN/0603207N/2341: *METOC Data Acquisition*	4.268	5.483	3.471	2.500	5.971	5.836	5.741	5.948	7.859	Continuing	Continuing
• RDTEN/0603207N/2342: *METOC Data Assimilation and MOD*	20.082	21.111	17.441	-	17.441	20.461	21.596	21.495	22.441	Continuing	Continuing
• RDTEN/0604218N/2346: *METOC Sensor Engineering*	1.138	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.883

Remarks

D. Acquisition Strategy

Acquisition, management and contracting strategies are to support engineering and manufacturing development by providing funds to Naval Research Laboratories and miscellaneous contractors, with management oversight by the Office of Naval Research.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*

E. Performance Metrics

Goal: Develop and engineer equipment to acquire meteorological and oceanographic (METOC) data in order to improve the accuracy of global and regional scale Meteorological and Oceanographic forecast models.

Metric: Tasks will address no less than 75% of applicable capability gaps and requirements, as identified by Resource and Requirements Sponsor(s). As tasks relate to exploitation of fleet sensors for METOC data (Through-the-Sensor), no less than 80% of approved initiatives will maintain cost, schedule, performance and transition risk analysis certification that will have been completed within the past 12 months.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities (DBR)	WR	Naval Research Laboratory : Monterey, CA	23.133	0.388	Nov 2016	0.000		0.000		-		0.000	0.000	23.521	-
METOC Future Mission Capabilities	Various	Various : Various	33.009	0.000		0.000		0.000		-		0.000	0.000	33.009	-
Littoral Battlespace Sensing - Gliders	C/CPIF	Teledyne Brown Engineering : Alabama	0.618	0.988	Mar 2017	0.247	Mar 2018	0.226	Mar 2019	-		0.226	Continuing	Continuing	Continuing
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/FP	Hydroid : Pocasset, MA	0.735	0.968	Mar 2017	0.216	Mar 2018	0.000		-		0.000	0.000	1.919	Continuing
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.132	Mar 2019	-		0.132	Continuing	Continuing	Continuing
METOC ESRP	SS/CPFF	RAYTHEON : Indianapolis	1.362	0.265	Feb 2017	0.319	Feb 2018	0.314	Feb 2019	-		0.314	Continuing	Continuing	Continuing
		Subtotal	58.857	2.609		0.782		0.672		-		0.672	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
METOC Future Mission Capabilities	C/CPFF	SSA/CSC : MISC	1.312	0.000		0.000		0.000		-		0.000	0.000	1.312	-
Littoral Battlespace Sensing - Autonomous Undersea Vehicle	Various	Various : Various	0.767	0.000		0.000		0.000		-		0.000	0.000	0.767	-
		Subtotal	2.079	0.000		0.000		0.000		-		0.000	0.000	2.079	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	OPTEVFOR : Virginia	0.424	0.000		0.000		0.000		-		0.000	0.000	0.424	-
Littoral Battlespace Sensing - Unmanned Undersea Vehicle	WR	NSWC Carderock : Maryland	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
METMF R NEXGEN	C/FP	Smiths Detection : Rhode Island	0.090	0.000		0.000		0.000		-		0.000	0.000	0.090	-
		Subtotal	0.664	0.000		0.000		0.000		-		0.000	0.000	0.664	N/A

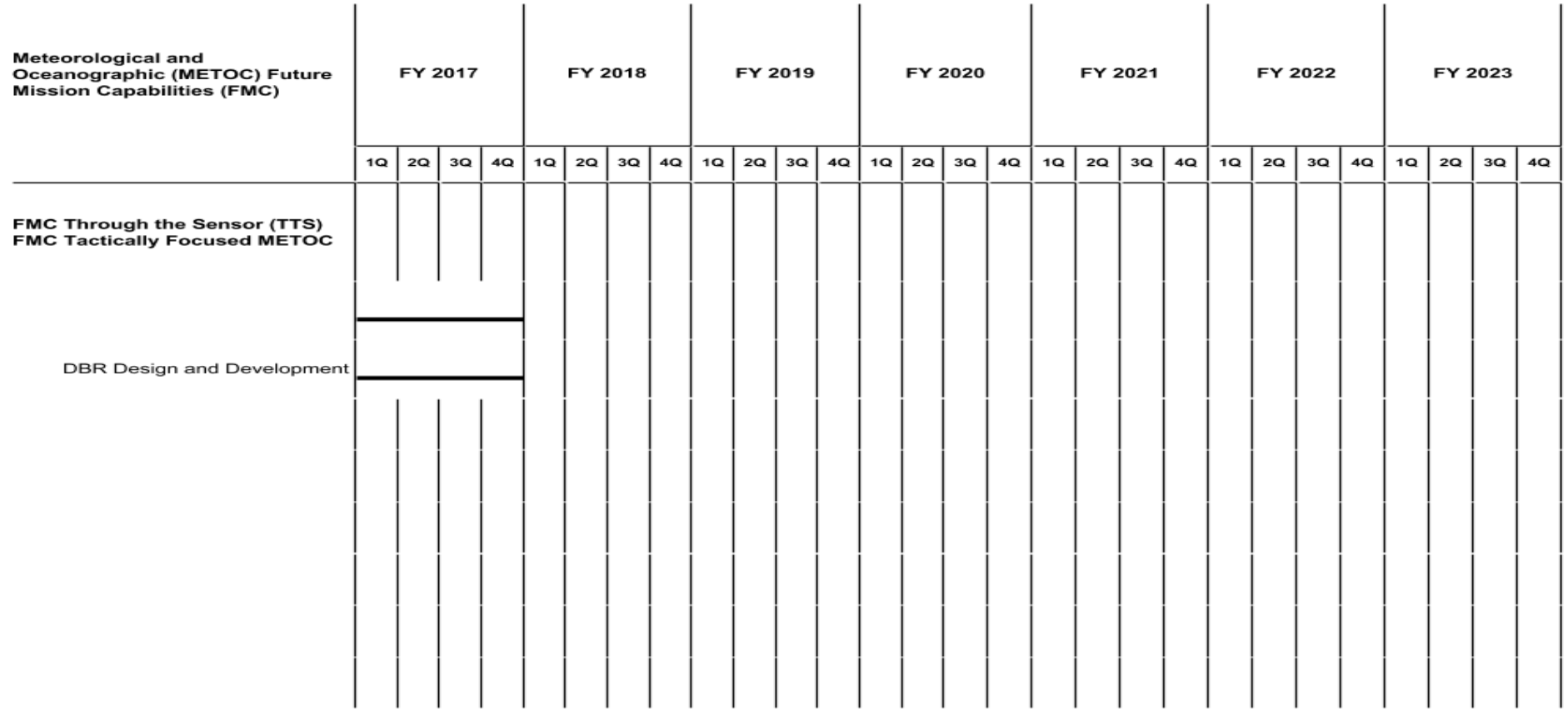
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services	C/CPFF	SAIC : Virginia	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
		Subtotal	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	62.000	2.609		0.782		0.672		-		0.672	Continuing	Continuing	N/A

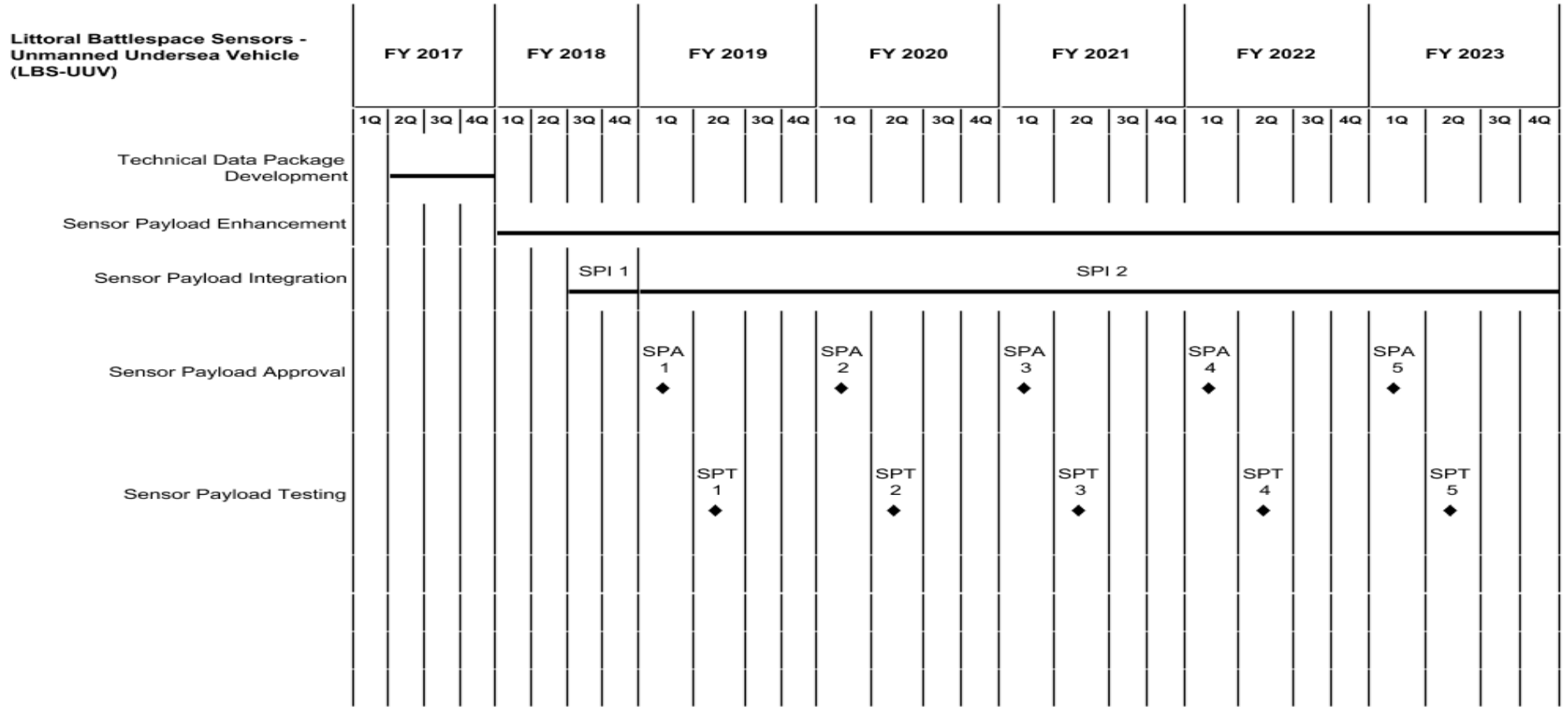
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*



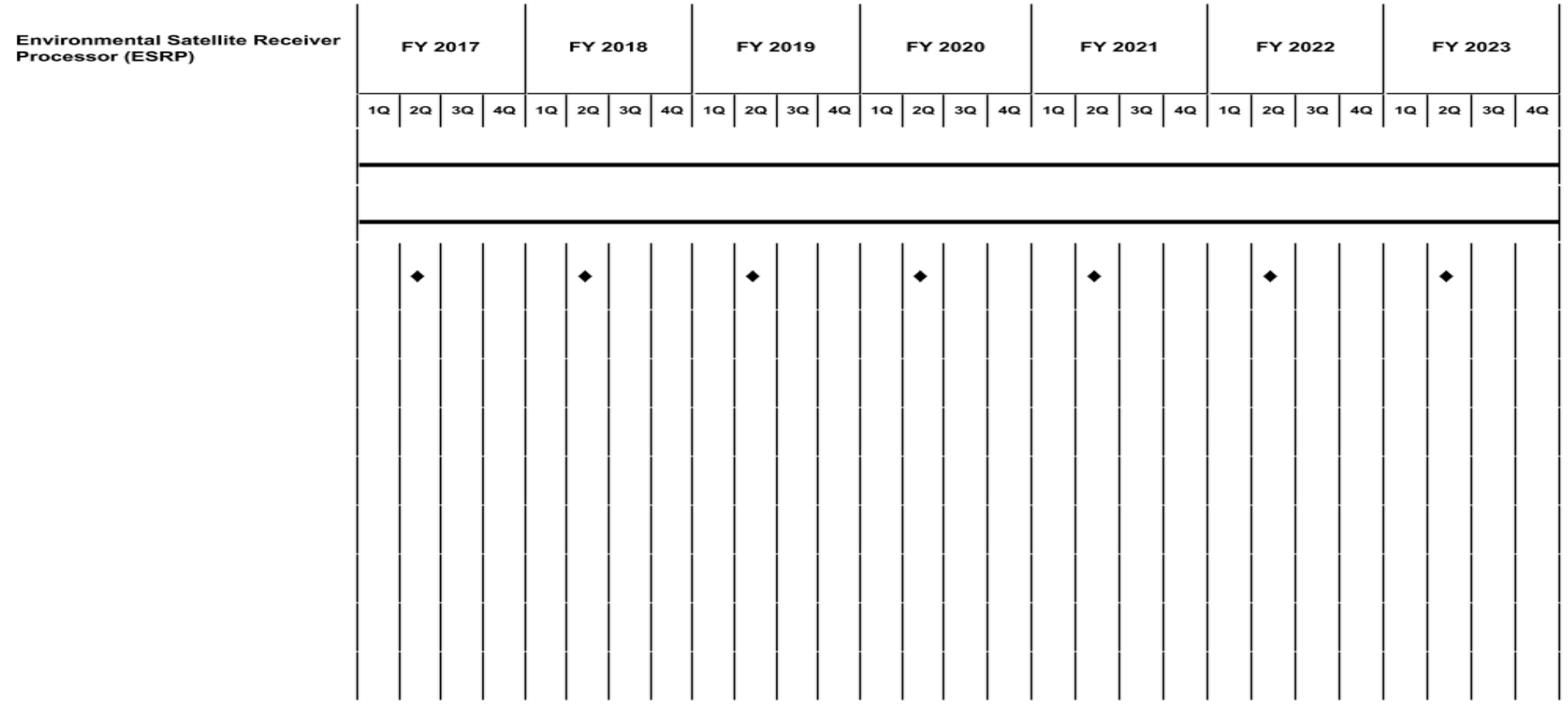
2019PB - 0604218N - 2345

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*



2019PB - 0604218N - 2345

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*



2019PB - 0604218N - 2345

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)				
FMC Through the Sensor (TTS) FMC Tactically Focused METOC:	1	2017	4	2017
FMC Through the Sensor (TTS) FMC Tactically Focused METOC: DBR Design and Development: Schedule Detail	1	2017	4	2017
Littoral Battlespace Sensors - Unmanned Undersea Vehicle (LBS-UUV)				
Technical Data Package Development:	2	2017	4	2017
Sensor Payload Enhancement:	1	2018	4	2023
Sensor Payload Integration: Sensor Payload Integration1	3	2018	4	2018
Sensor Payload Integration: Sensor Payload Integration 2	1	2019	4	2023
Sensor Payload Approval: Sensor Payload Approval 1	1	2019	1	2019
Sensor Payload Approval: Sensor Payload Approval 2	1	2020	1	2020
Sensor Payload Approval: Sensor Payload Approval 3	1	2021	1	2021
Sensor Payload Approval: Sensor Payload Approval 4	1	2022	1	2022
Sensor Payload Approval: Sensor Payload Approval 5	1	2023	1	2023
Sensor Payload Testing: Sensor Payload Testing 1	2	2019	2	2019
Sensor Payload Testing: Sensor Payload Testing 2	2	2020	2	2020
Sensor Payload Testing: Sensor Payload Testing 3	2	2021	2	2021
Sensor Payload Testing: Sensor Payload Testing 4	2	2022	2	2022
Sensor Payload Testing: Sensor Payload Testing 5	2	2023	2	2023
Environmental Satellite Receiver Processor (ESRP)				
ESRP Sensors in View Development	1	2017	4	2023
ESRP Sensors in View Integration	1	2017	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2345 / *Fleet METOC Equipment*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ESRP Satellite Testing (FY17)	2	2017	2	2017
ESRP Satellite Testing (FY18)	2	2018	2	2018
ESRP Satellite Testing (FY19)	2	2019	2	2019
ESRP Satellite Testing (FY20)	2	2020	2	2020
ESRP Satellite Testing (FY21)	2	2021	2	2021
ESRP Satellite Testing (FY22)	2	2022	2	2022
ESRP Satellite Testing (FY23)	2	2023	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2346 / *METOC Sensor Engineering*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2346: *METOC Sensor Engineering*	23.745	1.138	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.883
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for the engineering and manufacturing development of specialized, high resolution instrumentation systems and measurement capabilities for obtaining near real-time, in-situ Meteorological and Oceanographic (METOC) data in hostile, remote, and denied areas. The project's objectives are to engineer near term future mission sensing capabilities that are intended to survive the harsh littoral and deep-strike environments and also to meet demanding requirements for timeliness and accuracy. Engineering is performed within this project to ensure that air and safety certification for deployment from fleet aircraft or ships is met and that the proper data formats are engineered for electronic communications transmissions, human interface displays, and inputs to predictive models. The major area of emphasis is the METOC Future Mission Capabilities (FMC) project.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Meteorological and Oceanographic (METOC) Future Mission Capabilities (FMC)	1.138	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The Navy decided to discontinue the FMC project label, starting in 2018. This was done as part of an effort to restructure METOC research and development funding into the Tasking, Collection, Prediction, Exploitation, and Dissemination (TCPED) construct coming into common use throughout Naval Information Forces. This restructuring for FY18 moves METOC RDT&E into PE 0603207N AIR/OCEAN TACTICAL APPLICATIONS					
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	1.138	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2346 / *METOC Sensor Engineering*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTEN/0603207N/2341: *METOC DATA ACQUISITION*	4.437	5.467	5.316	-	5.316	5.341	5.447	5.556	0.000	Continuing	Continuing
• RDTEN/0603207N/2342: *METOC DATA ASSIMILATION AND MOD*	20.165	19.997	20.869	-	20.869	21.221	21.698	22.162	0.000	Continuing	Continuing
• RDTEN/0604218N/2345: *FLEET METOC EQUIPMENT*	2.692	0.736	0.723	-	0.723	0.691	0.704	0.718	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Acquisition and contracting strategies are to support engineering and manufacturing development of specialized, high resolution instrumentation systems and measurement techniques for obtaining near real-time in-situ Meteorological and Oceanographic (METOC) data in denied or remote areas by providing funds to miscellaneous performers.

E. Performance Metrics

Goal: Develop and engineer unique sensors to acquire METOC data in order to improve the accuracy of global and regional scale meteorological and oceanographic forecast models.

Metric: Tasks will address no less than 75% of applicable capability gaps and requirements, as identified by Resource Sponsor and Type Commander(s). No less than 75% of sensor engineering initiatives will be informed by an Analysis of Alternatives or market study to assess the state of the technology.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2346 / *METOC Sensor Engineering*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	Naval Research Laboratory : Monterey, CA	10.276	1.138	Nov 2016	0.000		0.000		-		0.000	0.000	11.414	-
Product Development	Various	Various : Various	11.750	0.000		0.000		0.000		-		0.000	0.000	11.750	-
Product Development	C/CPFF	University of Washington : Washington	0.225	0.000		0.000		0.000		-		0.000	0.000	0.225	-
Product Development	WR	NSWC Carderock : Maryland	0.230	0.000		0.000		0.000		-		0.000	0.000	0.230	-
Product Development	WR	SSC PAC : San diego, CA	0.982	0.000		0.000		0.000		-		0.000	0.000	0.982	-
Product Development	WR	NPS : Monterey, CA	0.063	0.000		0.000		0.000		-		0.000	0.000	0.063	-
Product Development	C/CPFF	OWEN, LLC : New Jersy	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
		Subtotal	23.726	1.138		0.000		0.000		-		0.000	0.000	24.864	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce	C/CPFF	Not Specified : Not Specified	0.008	0.000		0.000		0.000		-		0.000	0.000	0.008	0.008
METOC Future Mission Capabilities	C/CPFF	Various : Various	0.011	0.000		0.000		0.000		-		0.000	0.000	0.011	-
		Subtotal	0.019	0.000		0.000		0.000		-		0.000	0.000	0.019	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	23.745	1.138		0.000		0.000		-		0.000	0.000	24.883	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2346 / *METOC Sensor Engineering*

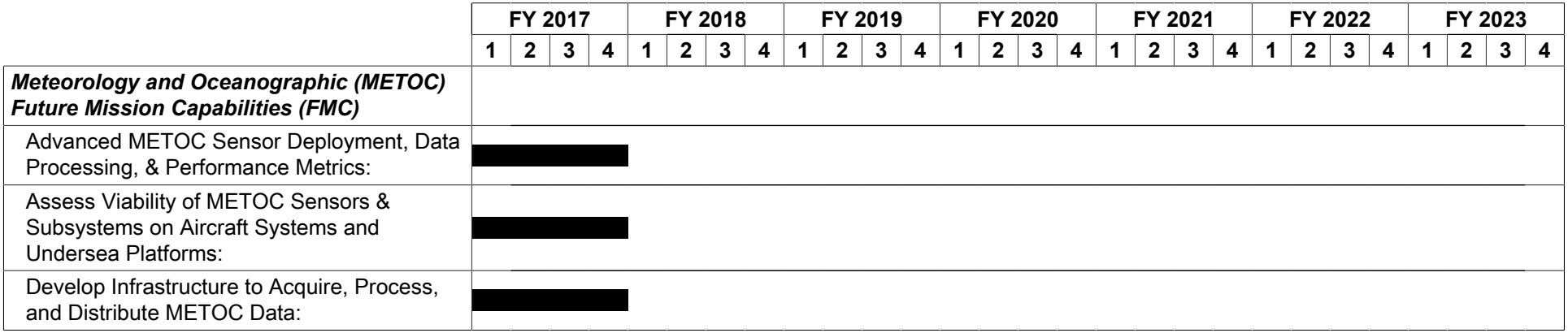


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2346 / *METOC Sensor Engineering*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Meteorology and Oceanographic (METOC) Future Mission Capabilities (FMC)				
Advanced METOC Sensor Deployment, Data Processing, & Performance Metrics:	1	2017	4	2017
Assess Viability of METOC Sensors & Subsystems on Aircraft Systems and Undersea Platforms:	1	2017	4	2017
Develop Infrastructure to Acquire, Process, and Distribute METOC Data:	1	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2363 / *Remote Sensing Capability Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2363: *Remote Sensing Capability Development*	11.505	0.000	0.000	5.642	-	5.642	7.111	3.657	3.742	6.154	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Total funding control for Remote Sensing Capability Development (2363) in FY19 and beyond was moved from Program Element (PE) 0603207N AIR/OCEAN TACTICAL APPLICATIONS to PE 0604218N AIR/OCEAN EQUIPMENT ENGINEERING as a result of a Budget Activity (BA) reclassification.

A. Mission Description and Budget Item Justification

Remote Sensing Capability Development characterizes the ocean environment using a variety of remote sensing techniques that provide that capability to discriminate atypical oceanographic phenomena from the natural environment that will greatly improve undersea dominance capabilities. The Naval Oceanographic Office will employ oceanographic data to refine and extend environmental characterization of the phenomena and disseminate data to the Fleet.

FY 2019 request provides for continued target data collection, enhancements on algorithms and continue to integrate algorithms for access over the network.

FY19 funds are to develop and deliver algorithms in support of the Remote Sensing Capability Development (RSCD) project and will support Fleet Anti-Submarine Warfare (ASW) and Mine Warfare (MIW) missions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Remote Sensing Capability Development	0.000	0.000	5.642	0.000	5.642
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Continue data collection in various weather and sea states to broaden the range of environmental conditions and reduce uncertainty in environmental prediction. Continue software algorithm performance analysis. Continue software algorithm enhancements to automatically detect oceanographic phenomena. Continue software algorithm enhancements and modifications to support transition to a new architecture. Continue to implement the algorithm performance assessment strategy as well as the test and evaluation plans. Document software algorithm test reports. Continue to integrate algorithms for access over the network. Continue development of training to provide the user community education on using the different tools and applications. Coordinate Task,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2363 / *Remote Sensing Capability Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Collect, Process, Exploit, Disseminate (TCPED) process amongst inter-agencies to support Navy Missions. Based on emerging threats, expand scope of the Seahorse to include new surface detection algorithms. Continue to develop, enhance, and integrate, surface detection algorithm capabilities, and provide input to Fleet training and CONOPS development. Effort introduces rigor and standardization of target detection capabilities in support of CLUTCHSHOT. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increased from FY18 (PE 0603207N AIR/OCEAN TACTICAL APPLICATIONS) to FY19 to expand scope of surface ship detection algorithms for SEAHORSE/Remote Sensing Capability Development based on emerging threats.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.642	0.000	5.642

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Remote Sensing Capability Development is being managed as a Program Executive Office (PEO) Project, via a Project Definition Document (PDD) construct for acquisition rigor and oversight.

E. Performance Metrics

Available in the Project's Requirements Definition Package (RDP).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2363 / *Remote Sensing Capability Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	C/FFP	SAIC : Virginia	1.284	0.000		0.000		0.816	Feb 2019	-		0.816	Continuing	Continuing	Continuing
Remote Sensing Capability Development Data Collection	WR	NRL : Washington, DC	1.212	0.000		0.000		1.269	Nov 2018	-		1.269	Continuing	Continuing	Continuing
Remote Sensing Capability Development Data Collection	C/FFP	Cubic : San Diego, CA	7.070	0.000		0.000		1.410	Apr 2019	-		1.410	Continuing	Continuing	Continuing
		Subtotal	9.566	0.000		0.000		3.495		-		3.495	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	WR	SSC PAC : San Diego, CA	0.472	0.000		0.000		0.888	Mar 2019	-		0.888	0.000	1.360	-
		Subtotal	0.472	0.000		0.000		0.888		-		0.888	0.000	1.360	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	WR	SSC PAC : San Diego, CA	1.122	0.000		0.000		1.259	Mar 2019	-		1.259	Continuing	Continuing	Continuing
		Subtotal	1.122	0.000		0.000		1.259		-		1.259	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604218N / *Air/Ocean Equipment Engineering*	Project (Number/Name) 2363 / *Remote Sensing Capability Development*	

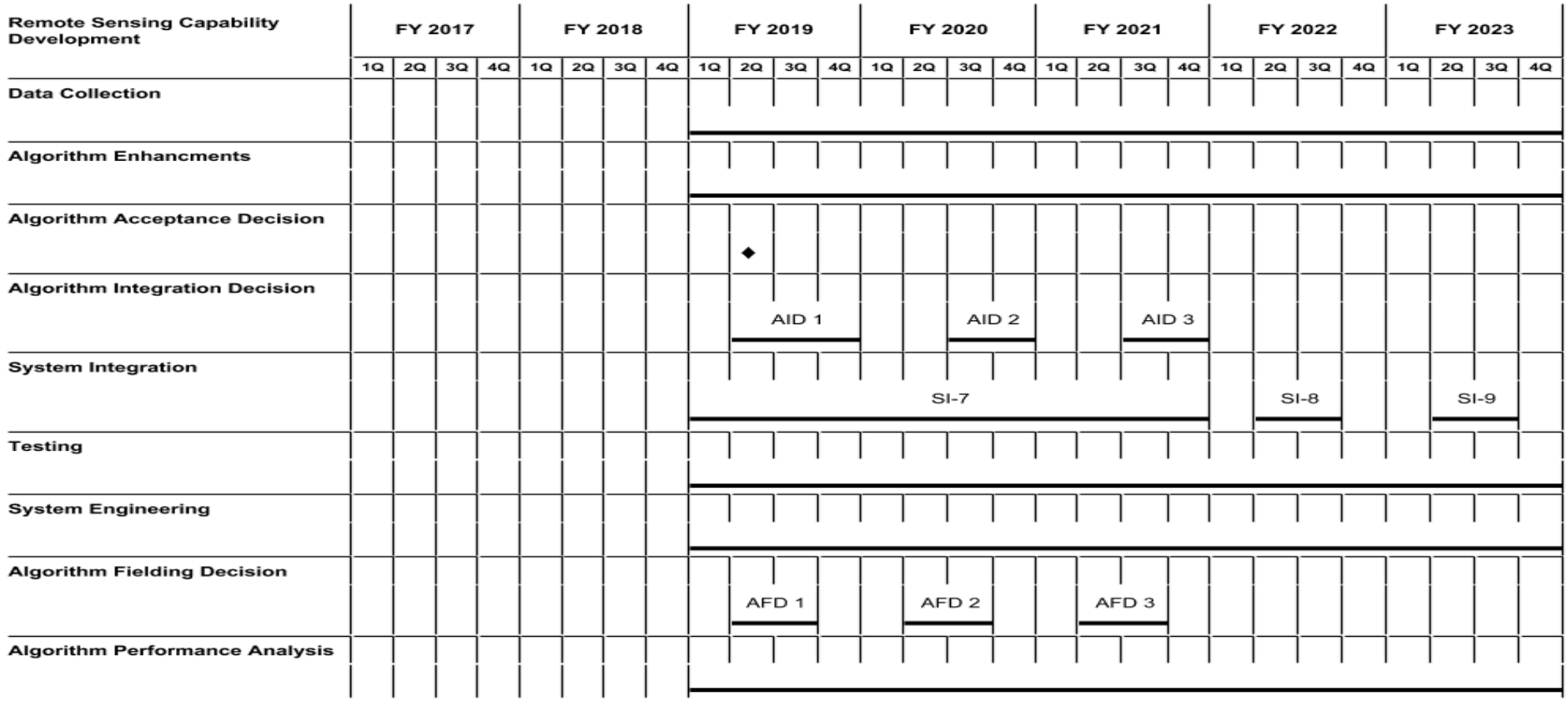
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Remote Sensing Capability Development Data Collection	C/FP	BAH : Virginia	0.345	0.000		0.000		0.000		-		0.000	0.000	0.345	-
		Subtotal	0.345	0.000		0.000		0.000		-		0.000	0.000	0.345	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	11.505	0.000		0.000		5.642		-		5.642	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2363 / *Remote Sensing Capability Development*



2019PB - 0604218N - 2363

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604218N / *Air/Ocean Equipment Engineering*	**Project (Number/Name)** 2363 / *Remote Sensing Capability Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Remote Sensing Capability Development				
Data Collection:	1	2019	4	2023
Algorithm Enhancments:	1	2019	4	2023
Algorithm Acceptance Decision:	2	2019	2	2019
Algorithm Integration Decision: Algorithm Integration Decision 1	2	2019	4	2019
Algorithm Integration Decision: Algorithm Integration Decision 2	3	2020	4	2020
Algorithm Integration Decision: Algorithm Integration Decision 3	3	2021	4	2021
System Integration: System Integration 7	1	2019	4	2021
System Integration: System Integration 8	2	2022	3	2022
System Integration: System Integration 9	2	2023	3	2023
Testing:	1	2019	4	2023
System Engineering:	1	2019	4	2023
Algorithm Fielding Decision: Algorithm Fielding Decision 1	2	2019	3	2019
Algorithm Fielding Decision: Algorithm Fielding Decision 2	2	2020	3	2020
Algorithm Fielding Decision: Algorithm Fielding Decision 3	2	2021	3	2021
Algorithm Performance Analysis:	1	2019	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604221N *I P-3 Modernization Program*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	20.655	1.864	1.361	2.134	-	2.134	0.001	0.000	0.000	0.000	0.000	26.015
3016: *Fatigue Life Mgmt Program*	20.655	1.864	1.361	2.134	-	2.134	0.001	0.000	0.000	0.000	0.000	26.015

A. Mission Description and Budget Item Justification

Fatigue Life Management Program is required to manage P-3/EP-3 inventory fatigue life and includes ongoing structural analysis, analyzing emergent structural issues, conducting engineering studies, assessing Fleet impact, and applying new technologies such as Non-Destructive Inspection techniques.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

The FY 2019 funding request was reduced by $0.036 million to account for the availability of prior year execution balances.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	1.909	1.361	2.169	-	2.169
Current President's Budget	1.864	1.361	2.134	-	2.134
Total Adjustments	-0.045	0.000	-0.035	-	-0.035
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.045	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.035	-	-0.035

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604221N / *P-3 Modernization Program*				Project (Number/Name) 3016 / *Fatigue Life Mgmt Program*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3016: *Fatigue Life Mgmt Program*	20.655	1.864	1.361	2.134	-	2.134	0.001	0.000	0.000	0.000	0.000	26.015
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Fatigue Life Management Program is required to manage P-3/EP-3 inventory fatigue life and includes ongoing structural analysis, analyzing emergent structural issues, conducting engineering studies, assessing Fleet impact, and applying new technologies such as Non-Destructive Inspection techniques.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: P-3/EP-3 Fatigue Life Management	1.864	1.361	2.134	0.000	2.134
Articles:	-	-	-	-	-
FY 2018 Plans: Fatigue Life Management Program: Manage P-3/EP-3 inventory fatigue life including conducting structural analysis, analyzing structural issues, conducting engineering studies, and assessing Fleet impact. Research, test and apply new Fatigue Inspection techniques to the P-3/EP-3 Fleet.					
FY 2019 Base Plans: Fatigue Life Management Program: Manage P-3/EP-3 inventory fatigue life including conducting structural analysis, analyzing structural issues, conducting engineering studies, and assessing Fleet impact. Research, test and apply new Fatigue Inspection techniques to the P-3/EP-3 Fleet. The FY 2019 funding request was reduced by $0.036 million to account for the availability of prior year execution balances					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: $.0773M increase supports the P-3/EP-3 sustainment requirements pending the transition to the P-8A Multi-Mission Maritime Aircraft (MMA).					
Accomplishments/Planned Programs Subtotals	1.864	1.361	2.134	0.000	2.134

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604221N / *P-3 Modernization Program*	**Project (Number/Name)** 3016 / *Fatigue Life Mgmt Program*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0538: *P-3 Series*	2.781	0.700	0.829	-	0.829	0.633	0.000	0.000	0.000	0.000	4,911.636

Remarks

D. Acquisition Strategy

The Fatigue Life Management Program leverages off of prior work done under P-3 Service Life Extension Program (2451). The Anti-Surface Warfare Improvement Program Operational Requirements Documents 355-88-94 was approved 30 March 94. Work will be performed by Lockheed Martin Aeronautical Systems and other industry participants along with the Naval Air Systems Command Structural Engineering Dept, AIR-4.3. This program supports the 7 June 2003 CNO approved P-3/EP-3 Sustainment Bridge to Multi-Mission Maritime Aircraft.

E. Performance Metrics

Successful application of system engineering processes.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604221N / *P-3 Modernization Program*	Project (Number/Name) 3016 / *Fatigue Life Mgmt Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPIF	LM : Marietta, GA	10.924	1.000	Jan 2017	0.778	Jan 2018	1.528	Jan 2019	-		1.528	Continuing	Continuing	Continuing
		Subtotal	10.924	1.000		0.778		1.528		-		1.528	Continuing	Continuing	N/A

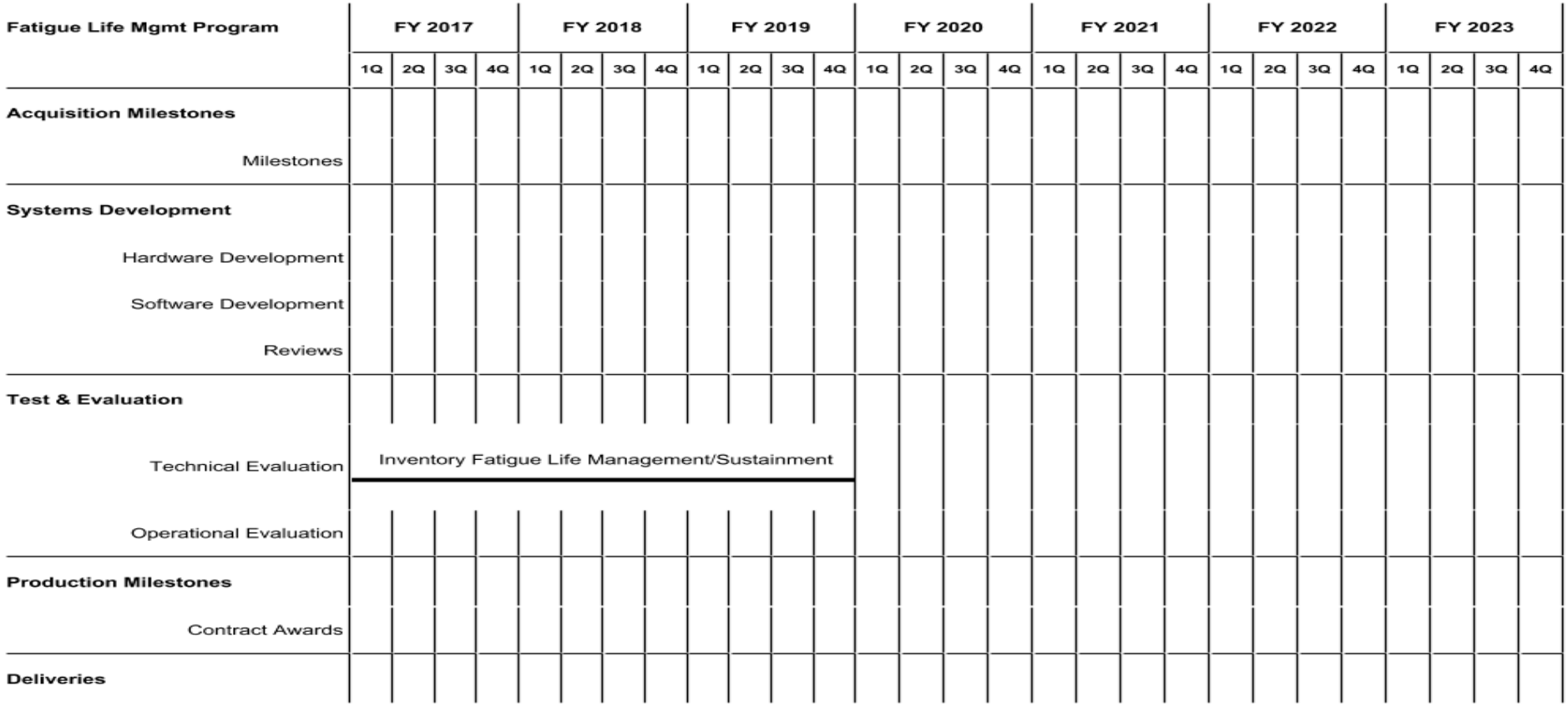
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : PAX RIVER, MD	8.496	0.824	Nov 2016	0.543	Nov 2017	0.566	Nov 2018	-		0.566	0.000	10.429	10.449
Travel	WR	NAWCAD : PAX RIVER, MD	0.965	0.040	Oct 2016	0.040	Oct 2017	0.040	Oct 2018	-		0.040	0.000	1.085	1.085
Prior Year costs no longer funded in FYDP	Various	Various : Various	0.270	0.000		0.000		0.000		-		0.000	0.000	0.270	-
		Subtotal	9.731	0.864		0.583		0.606		-		0.606	0.000	11.784	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.655	1.864		1.361		2.134		-		2.134	Continuing	Continuing	N/A

Remarks

Exhibit R-4, **RDT&E Schedule Profile:** PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604221N / *P-3 Modernization Program*	**Project (Number/Name)** 3016 / *Fatigue Life Mgmt Program*



2019OSD - 0604221N - 3016

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604221N / *P-3 Modernization Program*	**Project (Number/Name)** 3016 / *Fatigue Life Mgmt Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Fatigue Life Mgmt Program				
Test & Evaluation: Technical Evaluation: Inventory Fatigue Life Management/ Sustainment	1	2017	4	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604230N *I Warfare Support System*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	70.807	11.404	19.567	9.729	-	9.729	10.689	10.563	10.091	10.304	Continuing	Continuing
3326: *NSW Rapid Capabilities Development for CIEC*	21.245	4.928	13.573	6.004	-	6.004	5.619	5.629	5.541	5.655	Continuing	Continuing
4011: *Naval Coastal Warfare Surv and C4I Sys*	44.922	3.353	3.886	3.043	-	3.043	3.847	3.814	3.664	3.745	Continuing	Continuing
9C86: *Combatant Craft Replacement*	4.640	3.123	2.108	0.682	-	0.682	1.223	1.120	0.886	0.904	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Rapid Capabilities Development (RCD) project supports the Naval Special Warfare Branch to identify and assess available technologies that confront current and future irregular and expeditionary challenges. The program's development efforts are focused on the enhancement/advancement of existing technologies to fill urgent and emergent capability gaps for Naval Special Warfare (NSW). Program funding provides for the development, integration, testing, validation and combat demonstration of identified technologies and/or packages of technologies to meet: Overseas Contingency Operations (OCO) goals, service common and NSW program technology challenges, and technology obsolescence issues of developed capabilities. The goal of the RCD project is to develop expeditionary/operational capabilities for NSW that enable its force to conduct cross-domain special reconnaissance, counterterrorism, direct action, irregular warfare, and foreign internal defense; and fulfill urgent/emergent needs within a 6-24 month timeframe.

As part of the Naval Coastal Warfare Surveillance program, Identity Dominance System (IDS) supports the Joint Personnel Identity (JPI) program. Maritime Expeditionary Security Force (MESF) have a mobile security mission that requires methodologies, procedures, equipment and the communications capacity to identify individuals who represent a potential threat as a means to deter and eliminate individuals from conducting asymmetric/non-traditional attacks upon friendly forces, high value assets and coastal areas that Naval Coastal Warfare (NCW) is charged with protecting. The Visit, Board, Search and Seizure (VBSS) teams conducting Expanded Maritime Interception Operations also have a similar requirement to identify individuals. The development of a device to support identity functions is captured in the IDS Capability Development Document (CDD) and implemented in the IDS Capability Production Document (CPD). IDS units are used in the following environments: aboard ships, ashore at ports, the littorals, and extended inland field environments worldwide. IDS is employed in both maritime and very austere ashore environments, carried by individuals who are part of ship boarding parties and by dismounted patrols. These mission and environmental requirements demand the need for a portable, lightweight, ruggedized, and reliable system with intuitive and user friendly features. IDS biometric modalities may differ by mission profile, requiring the authoritative response to the On-Scene Commander/Boarding Officer on whether to detain or further investigate an individual of interest or engage in a more thorough search of boarded ships.

The Navy Expeditionary C4I project supports the Navy Expeditionary Combat Command (NECC) mission to detect, deter or interdict potential threats to DoN assets using agile, modular and scalable technology. NECC units have a number of current and future Command, Control, Communications, Computers & Intelligence (C4I) technological requirements for Tactical/Command Operations Center, tactical vehicles, combatant craft, and dismounted personnel. NECC operations require units

to maintain effective command and control, develop and display a common tactical picture, and share intelligence and current operational information with higher headquarters, subordinate units, joint forces and coalition allies. Small, Medium, and Large Scale Communication Systems (LSCS) are the C4I hub for the NECC; Navy Enterprise Tactical Command and Control (NETC2) is the converged LSCS baseline. Future C4I research and development include enhanced information transport, network cyber security posture, assured communications in denied environments along with agility and mobility. Funding is required for testing and evaluation of cyber security issue associated with obsolescence of network items and if not addressed will impact the ability of the Program Office to maintain system accreditation under Risk Management Framework (RMF) revoking multiple LSCS assets authority to connectivity on the Department of Defense Information Network (DoDIN). Efforts are in alignment with NECC's strategic Expeditionary Warfare Improvement Program (EXWIP) Integrated Priority Capability List (IPCL) priorities and maintain alignment with greater DoD initiatives, such as Joint Information Environment (JIE), Mission Partner Environment (MPE) in order to maintain interoperability and drive down DoN enterprise costs.

Combatant Craft Replacement will provide second generation Riverine Multi Mission Craft that will replace in-service Riverine Patrol Boats (RPBs) and Riverine Assault Boats (RABs). Combatant Craft replacements will: conduct inland waterway patrol and interdiction to preserve the rivers for friendly use as lines of communications; deny the use of rivers and waterways to waterborne and immediate shore sited hostile forces by barrier and interdiction operations; and, with augmentation of ground and air forces, locate and destroy hostile forces within a riparian area. Specific mission and capabilities will be identified in an Initial Capabilities Document (ICD). RDT&E funding will fund feasibility studies and procurement of mock-ups and prototype craft to demonstrate capabilities prior to production craft procurement.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	13.237	14.167	11.699	-	11.699
Current President's Budget	11.404	19.567	9.729	-	9.729
Total Adjustments	-1.833	5.400	-1.970	-	-1.970
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.133	0.000			
• Program Adjustments	0.000	5.400	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	-1.970	-	-1.970
• Congressional Directed Reductions Adjustments	-1.700	-	-	-	-

Change Summary Explanation

FY2017 -1.833 program reduction due to congressional reductions and SBIR assessments.

FY2018 +5.400 to identify, assess, integrate and test prototype technologies focused on Counter Unmanned Aerial Systems (CUAS).

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604230N *I Warfare Support System*

FY2019 funding request was reduced by $1.127 million to account for the availability of prior year execution balances. The balance of $.843M due to misc rate adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604230N / *Warfare Support System*	Project (Number/Name) 3326 / *NSW Rapid Capabilities Development for CIEC*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3326: *NSW Rapid Capabilities Development for CIEC*	21.245	4.928	13.573	6.004	-	6.004	5.619	5.629	5.541	5.655	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY2019 funding request was reduced by $0.494 million to account for the availability of prior year execution balances.

The Rapid Capabilities Development (RCD) project supports the Naval Special Warfare Branch to identify and assess available technologies that confront current and future irregular and expeditionary challenges. The program's development efforts are focused on the enhancement/advancement of existing technologies to fill urgent and emergent capability gaps for Naval Special Warfare (NSW). Program funding provides for the development, integration, testing, validation and combat demonstration of identified technologies and/or packages of technologies to meet: Contingency Operations goals, service common and NSW program technology challenges, and technology obsolescence issues of developed capabilities.

The goal of the RCD project is to develop expeditionary/operational capabilities for NSW that enable its force to conduct cross-domain special reconnaissance, counterterrorism, direct action, irregular warfare, and foreign internal defense; and fulfill urgent/emergent needs within a 6-24 month timeframe.

In addition to supporting NSW the program also provides support for irregular warfare and expeditionary related urgent/emergent technology requirements as outlined in Joint Urgent Operational Needs (JUON), Navy Urgent Operational Needs (UON), and/or support rapid insertion into a Department of Navy (DoN) Program of Record (PoR) or other acquisition programs.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Navy Irregular Warfare	4.928	13.573	6.004	0.000	6.004
Articles:	-	-	-	-	-
FY 2018 Plans: The RCD program, PB18 budgeted value of $13.573, will utilize; $7.3M for Counter Unmanned Aerial Systems (CUAS) to identify, assess, integrate and test prototype technologies supporting NSW deployed forces encountering the proliferation of unconventional, unmanned system threats by non-state actors. Efforts will focus on near term NSW OCONUS requirements that leverage existing efforts across DoD to accelerate a solution to the field. Development emphasis will be on the discover/ detect/ID portion of the engagement sequence for more robust dismounted solutions in a cluttered environment					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 3326 / *NSW Rapid Capabilities Development for CIEC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
as well as implementation of modular capabilities using standardized architectural interconnects that will allow for tightly integrated system of systems. $2.0M of FY18 funding will center on rapid innovation to solve emerging gaps within ongoing operations. The most notable effort in FY18 is Maritime Precision Engagement (MPE). These funds provide for acceleration of a fielded MPE capability that will address two operational gaps: precision strike from a small surface craft within a contested environment; and a land-based, organic stand-off weapon launched from a light, tactical vehicle with considerable range, precision, terminal control, and loiter capability. Such capabilities would counter multiple documented threats associated with both peer adversaries and Violent Extremist Organizations (VEOs). $4.2M of FY2018 funding supports the identification, assessment, integration and testing technologies that will focus on close-in expeditionary ISR, power and energy, sensor integration (EO/IR, Acoustic, RF), signature management, and navigation and communications in denied environments. Some of these efforts are continuations of prior year work, totaling an estimated $1.7M, including Sea Stalker and Critical Battery Management Software. ***FY 2019 Base Plans:*** The RCD program, PB19 budgeted value of $6.004M, will utilize; $1.3M for CUAS Joint Urgent Operational Need (JUON) to identify, assess, integrate and test prototype technologies supporting NSW deployed forces encountering the proliferation of unconventional, unmanned system threats by non-state actors. Efforts will focus on continuing advancement of FY18 prototyping efforts and field evaluation of developed technologies. $1.5M for MPE integration and field testing of the developed land and maritime variants to further refine the operational gaps associated to precision strike from a light, tactical vehicle; and small surface craft. $2.0M for sensor integration (Electro-Optic(EO)/Infrared(IR), Acoustic, Radio Frequency (RF)), payload development, signature management, navigation and communications in denied environments, and technologies that will support improvements to human performance on the battlefield.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 3326 / *NSW Rapid Capabilities Development for CIEC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
$1.8M to support the Broad Area Announcement process for the identification of technologies that enhance and/or accelerate expeditionary and irregular capabilities in support of NSW capability challenges; which remains open. Proposals received via this process will be reviewed for potential award in FY 2019, selected and submitted to contracting for execution. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY18 to FY19 is in accordance with planned program profile and is not due to a negative action against this effort.					
Accomplishments/Planned Programs Subtotals	4.928	13.573	6.004	0.000	6.004

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Identify the requirements necessary to meet immediate and future warfighter needs; integrate existing unique and/or related capabilities that can best meet those warfighter needs; test those integrated capabilities; and then demonstrate in real time and/or during planned deployments within a 6-24 month period. Endeavor to leverage existing mature technologies to take advantage of investments already made to reduce cost and time to market; and seek out cost-sharing opportunities with other resource sponsors to make program funding more effective for the expeditionary end-user.

E. Performance Metrics

Test, verify and validate developed system parameters against approved threshold and objective operational requirements established by the intended expeditionary end-user within the established budget and schedule. Transition the developed technologies to the respective Program Managers or end-users for operational evaluation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 3326 / *NSW Rapid Capabilities Development for CIEC*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Spt	C/CPFF	Dell : Washington, DC	0.625	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Spt	C/CPAF	Cydecor : Arlington, VA	0.060	0.156	Feb 2017	0.100	Feb 2018	0.150	Feb 2019	-		0.150	0.000	0.466	-
Travel	WR	NAVSEA/HQ : Washington, DC	0.240	0.059	Dec 2016	0.060	Dec 2017	0.050	Dec 2018	-		0.050	Continuing	Continuing	Continuing
Program Management Spt	WR	NAVSEA/HQ : Washington, DC	0.039	0.000		0.217	Jun 2018	0.000		-		0.000	0.000	0.256	-
Program Management Spt	WR	NSWC : Crane, IN	0.000	0.000		0.300	Oct 2017	0.000		-		0.000	0.000	0.300	-
Program Management Spt	WR	NSWC : Dahlgren, VA	0.000	0.000		0.050	Oct 2017	0.000		-		0.000	0.000	0.050	-
Program Management Spt	WR	NSWC : Panama City, FL	0.000	0.000		0.050	Oct 2017	0.000		-		0.000	0.000	0.050	-
Program Management Spt	WR	NSWC : Carderock, MD	0.000	0.000		0.050	Oct 2017	0.000		-		0.000	0.000	0.050	-
Program Management Spt	WR	NUWC : Newport, RI	0.000	0.000		0.050	Oct 2017	0.000		-		0.000	0.000	0.050	-
		Subtotal	0.964	0.215		0.877		0.200		-		0.200	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NUWC : Newport, RI	1.811	0.000		2.050	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	WR	NAWC : China Lake, CA	0.595	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evalution	WR	NSWC : Carderock, MD	0.639	0.250	Mar 2017	0.050	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evalution	SS/CPFF	ARL/UT : Austin, TX	0.447	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evalution	SS/CPFF	SPAWAR : San Diego, CA	1.195	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 3326 / *NSW Rapid Capabilities Development for CIEC*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	SPAWAR : Charleston, SC	1.050	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	WR	SPAWAR : San Diego, CA	1.254	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	SS/FFP	ARL/PSU : State College, PA	0.540	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	WR	NRL : Washington, DC	0.400	0.000		0.300	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	WR	NSWC : Indian Head, MD	1.156	0.706	Nov 2016	0.000		4.304	Apr 2019	-		4.304	Continuing	Continuing	Continuing
Test and Evaluation	Various	Various : Various	2.274	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	SS/FFP	NSWC : Panama City, FL	0.269	0.000		0.525	Oct 2017	0.000		-		0.000	0.000	0.794	-
Test and Evaluation	WR	NSWC : Dahlgren, VA	0.575	0.225	May 2017	0.000		1.500	Dec 2018	-		1.500	0.000	2.300	-
Test and Evaluatioin	SS/FFP	NSWC : Dahlgren, VA	0.512	0.000		0.000		0.000		-		0.000	0.000	0.512	-
Test and Evaluation	SS/CPFF	APL/JHU : Laurel, MD	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
Test and Evaluation	SS/CPFF	Army Research Lab. : Adelphia, MD	0.247	0.000		0.000		0.000		-		0.000	0.000	0.247	-
Test and Evaluation	SS/CPFF	PNNL : Richland, WA	0.130	0.000		0.000		0.000		-		0.000	0.000	0.130	-
Test and Evaluation	C/CPFF	Georgia Tech : Atlanta, GA	1.634	0.000		0.000		0.000		-		0.000	0.000	1.634	-
Test and Evaluation	C/CPFF	Charles River : Cambridge, MA	0.521	0.000		0.000		0.000		-		0.000	0.000	0.521	-
Test and Evaluation	C/CPFF	L3 Comm : Burlington, MA	0.972	0.000		0.000		0.000		-		0.000	0.000	0.972	-
Test and Evaluation	C/CPFF	QinetiQ NA : Waltham, MA	0.704	0.000		0.000		0.000		-		0.000	0.000	0.704	-
Test and Evaluation	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 3326 / *NSW Rapid Capabilities Development for CIEC*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	SS/CPFF	Strategos Consulting : Coronado, Ca	0.178	0.000		0.000		0.000		-		0.000	0.000	0.178	-
Test and Evaluation	WR	NAVAIR : San Diego, CA	0.425	0.000		0.000		0.000		-		0.000	0.000	0.425	-
Test and Evaluation	SS/CPFF	NSMA : Wash, DC	1.299	0.300	Nov 2016	0.000		0.000		-		0.000	0.000	1.599	-
Test and Evaluation	C/CPFF	Advaned Systems : Manassas, VA	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
Test and Evaluation	SS/CPFF	NAVSEA : Washington, DC	0.750	0.000		0.000		0.000		-		0.000	0.000	0.750	-
Test and Evaluation	WR	NSWC : Crane, IN	0.200	0.271	Jun 2017	0.225	Feb 2018	0.000		-		0.000	0.000	0.696	-
Test and Evaluation	Reqn	ANL : Chicago, IL	0.114	0.000		0.000		0.000		-		0.000	0.000	0.114	-
Test and Evaluation	WR	NUWC : Keyport, RI	0.115	0.174	May 2017	0.030	Feb 2018	0.000		-		0.000	0.000	0.319	-
Test and Evaluation	SS/CPFF	General Atomics : San Diego, CA	0.000	1.299	Jul 2017	0.624	Oct 2017	0.000		-		0.000	0.000	1.923	-
Test and Evaluation	SS/CPFF	ASSETT : Manassas, VA	0.000	0.385	Jul 2017	0.545	Oct 2017	0.000		-		0.000	0.000	0.930	-
Test and Evaluation	SS/CPFF	Battelle : Columbus, OH	0.000	0.734	Jul 2017	0.400	Oct 2017	0.000		-		0.000	0.000	1.134	-
Test and Evaluation	SS/CPFF	WHOI : Woods Hole, MA	0.000	0.000		0.225	Oct 2017	0.000		-		0.000	0.000	0.225	-
Test and Evaluation	SS/CPFF	Boeing : Seattle, WA	0.000	0.000		0.300	Oct 2017	0.000		-		0.000	0.000	0.300	-
Test and Evaluation	SS/CPFF	AeroVironment : Monrovia, CA	0.000	0.000		0.525	Oct 2017	0.000		-		0.000	0.000	0.525	-
Test and Evaluation	SS/CPFF	Northrup Grumman : Falls Church, VA	0.000	0.000		6.697	Jan 2018	0.000		-		0.000	0.000	6.697	-
Test and Evaluation	C/CPFF	IN POWER : Morrisville, NC	0.000	0.292	Jun 2017	0.000		0.000		-		0.000	0.000	0.292	-
Test and Evaluaition	WR	NSWC : Panama City, FL	0.000	0.077	May 2017	0.200	Feb 2018	0.000		-		0.000	0.000	0.277	-
		Subtotal	20.281	4.713		12.696		5.804		-		5.804	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604230N / *Warfare Support System*	Project (Number/Name) 3326 / *NSW Rapid Capabilities Development for CIEC*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.245	4.928		13.573		6.004		-		6.004	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 3326 / *NSW Rapid Capabilities Development for CIEC*

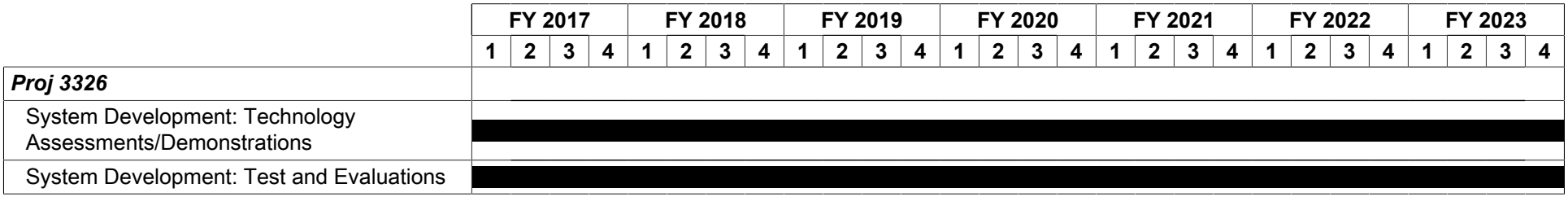


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 3326 / *NSW Rapid Capabilities Development for CIEC*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3326				
System Development: Technology Assessments/Demonstrations	1	2017	4	2023
System Development: Test and Evaluations	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604230N / *Warfare Support System*	Project (Number/Name) 4011 / *Naval Coastal Warfare Surv and C4I Sys*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
4011: *Naval Coastal Warfare Surv and C4I Sys*	44.922	3.353	3.886	3.043	-	3.043	3.847	3.814	3.664	3.745	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY2019 funding request was reduced by $0.563 million to account for the availability of prior year execution balances.

The Navy Expeditionary project supports the Navy Expeditionary Combat Command (NECC) mission to detect, deter or interdict potential threats to DoN assets using agile, modular and scalable technology. NECC units have a number of current and future Command, Control, Communications, Computers & Intelligence (C4I) technological requirements for Tactical/Command Operations Center, tactical vehicles, combatant craft, and dismounted personnel. NECC operations require units to maintain effective command and control, develop and display a common tactical picture, and share intelligence and current operational information with higher headquarters, subordinate units, joint forces and coalition allies. Small, Medium, and Large Scale Communication Systems (LSCS) are the C4I hub for the NECC; Navy Enterprise Tactical Command and Control (NETC2) is the converged LSCS baseline. Future C4I research and development include enhanced information transport, network cyber security posture, assured communications in denied environments along with agility and mobility. Funding is required for testing and evaluation of cyber security issue associated with obsolescence of network items and if not addressed will impact the ability of the Program Office to maintain system accreditation under Risk Management Framework (RMF) revoking multiple LSCS assets authority to connectivity on the Department of Defense Information Network (DoDIN). Efforts are in alignment with NECC's strategic Expeditionary Warfare Improvement Program (EXWIP) Integrated Priority Capability List (IPCL) priorities and maintain alignment with greater DoD initiatives, such as Joint Information Environment (JIE), Mission Partner Environment (MPE) in order to maintain interoperability and drive down DoN enterprise costs.

The future of large scale communications assets such as Mobile Ashore Support Terminal (MAST), Ruggedized Deployable Satellite/Tactical Data Network (RDSAT/ TDN) and Deployable Expeditionary Network-Medium (DEXNet-M) supporting Surveillance Control Central, Expeditionary (ESCC) formerly Radar Sonar Surveillance Center (RSSC) will be converging to a common baseline, the Navy Enterprise Tactical Command and Control (NETC2). Next generation air, surface and subsurface surveillance systems, as well as enhanced C4I capabilities, are required to meet operational objectives. Future technologies are being evaluated as enabling capabilities to expand situational awareness, providing additional tactical decision aids to the local area commander. Future C4I research and development efforts will be identified within NECC strategic Expeditionary Warfare Improvement Program (EXWIP) Integrated Priority Capability List (IPCL) priorities to increase agility, mobility and network security posture. Additional efforts will be driven by greater DoD initiatives, such as Joint Information Environment (JIE) Inc II, in order to maintain interoperability and drive down DoN enterprise costs.

Identity Dominance System (IDS) supports the Navy's Visit, Board, Search and Seizure (VBSS) teams conducting Expanded Maritime Interception Operations (MIO) with a biometric capability. IDS provides the Navy with a means to collect and process identity information in the conduct of maritime and expeditionary operations. There are three key aspects of this capability: 1) Enable forces to rapidly identify unknown individuals encountered in the conduct of operations. 2) Verify an unknown individual's claimed identity. 3) Enable forces to update, manage, and share identity information on friendly, neutral, and enemy individuals in support of identity

operations (IdOps). To support IdOps and achieve identity dominance for expeditionary and naval forces, the future biometrics collection and processing equipment needs to be smaller, lighter, and more efficient with respect to computing power and speed when compared against the current system. The equipment needs to take advantage of enhanced communications capabilities, be able to store the appropriate amount of data to collect biometric samples, match the samples against an internal database and reach near real time operations with connectivity to the DoD biometrics database. In addition to Navy VBSS MIO, IDS also supports the Expeditionary Exploitation Unit One (EXU-1) expeditionary missions. IDS must continue to mature and adapt to the changing threat environment and emerging requirements to support these missions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Identity Dominance System	1.029	1.247	0.748	0.000	0.748
Articles:	-	-	-	-	-
Description: The Identity Dominance System (IDS) is facing obsolescence and is scheduled for a technology refresh in FY19 to field a sustainable system, reduce maintenance and sustainment costs, improve system capabilities, and eliminate performance shortfalls.					
FY 2018 Plans: IDS will complete fielding and retrofit of the Windows 7 baseline. Request for Proposal will be released for technology refresh hardware procurement in Q1. IDS will continue technology refresh software development, which will be government-owned. IDS will continue to conduct quarterly Engineering Change Proposals to maintain Informational Assurance compliance along with all other testing that will be needed for technology refresh. Research, Development, Testing and Evaluation efforts will continue to develop and assess upgrades and modifications to keep IDS relevant and effective through follow-on support of Counter Improvised Explosive Devices (IEDs) and Force Protection efforts to those deployed. US Central Command Urgent Operational Needs (UONs) currently exist for biometrics collection capabilities, and requirements continue to grow. Biometrics was highly ranked at both the 2017 Anti-Terrorism Warfare Improvement Program and 2017 Expeditionary Warfare Improvement Program as a Fleet need for future years. All documentation necessary for technology refresh will begin to be updated. Due to the changing threat environment, the need for an enhanced capability has increased. The ability to rapidly collect and identify persons of interest has become a high priority in order to effectively identify threats, increase the security presence at both foreign and domestic access and entry control points, and enhance combat operations.					
FY 2019 Base Plans: IDS will integrate the government developed software for technology refresh into a hardware prototype. Tests and evaluations will be conducted to assure compatibility with the software and hardware. Environmental tests will be conducted along with operational tests by users. Software development will continue in order to incorporate different hardware devices and future enhanced modules, peripherals, and newer/cheaper					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
hardware devices. Windows 7 baseline will continue to be updated via Engineering Change Proposals for enhancements and Informational Assurance until the Windows 7 baseline system is completely replaced by the tech refresh system. IDS will increase and support the Counter IED and Force Protection efforts to those individuals deployed. The continued efforts of building a database of suspected enemies to the United States will allow potential threats to be identified at foreign access control points and in international waters. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY2018 to FY 2019 reduction funding is in accordance with planned program profile but also includes reductions due to the availability of prior year execution balances.					
Title: NECC C4ISR Modernization	2.324	2.639	2.295	0.000	2.295
Articles:	-	-	-	-	-
FY 2018 Plans: Enhancing Assured Command and Control (AC2) in a compromised communication environments encompassing Joint Information Environment (JIE), Coalition, and Mission Partner Environment (MPE) data integration, and on-the-move tactical data exfiltration and sharing. As well as enabling Tactical Hosting Environment Security Enhancements by adopting Virtual Secure Enclave (VSE) hosting and data protection/ prioritization concepts, and expansion of Mission Support Center (MSC) capabilities. ***FY 2019 Base Plans:*** Further enhance common baseline via development of Expeditionary Cloud Service Automated Patching/Cloud services and Commercial Solution For Classified Multi-Tenant Environment Replacing Type 1 Encryption. Also, enhance satellite communication Unified Net centric System Modernizing Teleport Step Sites as well as disconnected, intermittent and latent available cloud capabilites. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Accomplishments/Planned Programs Subtotals	3.353	3.886	3.043	0.000	3.043

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/8120: *Maritime Expeditionary Security Force*	9.073	4.010	3.576	-	3.576	6.003	3.345	3.522	3.600	0.000	135.989

Remarks

D. Acquisition Strategy

Funding supports an evolutionary acquisition strategy supporting the dynamically evolving rapid action mission of Navy Expeditionary Forces. Large Scale Communication Systems (LSCS) funding will align LSCS to the Deployable Joint Command and Control (DJC2) product baseline. The project will continuously analyze operational utilization of the systems and will roll analysis results into periodic system upgrades to address cyber security vulnerabilities, obsolescence, and maximize operational effectiveness. The intent of this strategy is to: drive down development, production, and logistics costs, while leveraging technologies developed for other agencies to increase the capabilities of Navy Expeditionary Forces. The baseline configuration for Large Scale Communication Systems (LSCS) is the Navy Enterprise Tactical Command and Control (NETC2), a system scalable to Adaptive Force Package (AFP) levels. Efforts include development of capabilities based on emergent requirements, operational feedback, alignment with Dept. of Defense initiatives such as Joint Information Environment (JIE) / Mission Partner Environment, and identification through strategic Expeditionary and Warfare Improvement Program (EXWIP) Integrated Priority Capability List (IPCL) priorities to include reach back for tactical vehicles and craft, blue force tracking, tactical data link capability, and sensor technologies in support of surveillance and reconnaissance missions.

Identity Dominance System (IDS) will continue to provide a biometric capability to the Navy's expeditionary/forward deployed forces through system upgrades and further collaboration with other biometric stakeholders. The funding supports development and integration of new capabilities designed to enhance the overall performance of IDS and improve our Nation's security posture abroad and INCONUS. The program continually assesses the threat environment, security posture, operational requirements, and DoD and Navy policies related to Identity Operations and Force Protection. As DOD biometrics requirements continue to grow, new lower cost, more capable technologies are emerging. The program will evaluate, integrate, and field these new capabilities to Maritime and Expeditionary Forces.

E. Performance Metrics

The Navy Expeditionary program continues to identify, evaluate and test a minimum of 3-5 new technologies or configurations per year for potential insertion into the Technical Refresh Plan, to be demonstrated at Fleet Demonstrations.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - Expeditionary	WR	SSC CH : CHARLESTON	1.580	0.405	Nov 2016	0.455	Nov 2017	0.401	Nov 2018	-		0.401	Continuing	Continuing	Continuing
Systems Engineering - Expeditionary	WR	NSWC : PANAMA CITY	2.711	0.831	Nov 2016	0.882	Nov 2017	0.762	Nov 2018	-		0.762	Continuing	Continuing	Continuing
Hardware/Software Development	WR	NSWC DAHLGREN : DAHLGREN	3.816	0.200	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Hardware/Software Development	WR	NSWC CRANE : CRANE	1.450	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - IDS	WR	NSWC : DAHLGREN	6.059	0.505	Nov 2016	0.584	Oct 2017	0.261	Jan 2019	-		0.261	Continuing	Continuing	Continuing
Hardware/Software Development - IDS	WR	NSWC : DAHLGREN	0.000	0.000		0.232	Oct 2017	0.245	Jan 2019	-		0.245	Continuing	Continuing	Continuing
Product Development Prior Years	Various	Various : Various	10.174	0.000		0.000		0.000		-		0.000	0.000	10.174	10.174
		Subtotal	25.790	1.941		2.153		1.669		-		1.669	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Data	WR	NSWC : CRANE	0.250	0.010	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Data	WR	NSWC : DAHLGREN	0.175	0.012	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Support Prior Years	Various	Various : Various	5.206	0.000		0.000		0.000		-		0.000	0.000	5.206	5.206
		Subtotal	5.631	0.022		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation - IDS	WR	NSWC : DAHLGREN	0.000	0.000		0.331	Jan 2018	0.242	Jan 2019	-		0.242	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation - Expeditionary	WR	NSWC : PANAMA CITY	0.680	0.670	Nov 2016	0.808	Nov 2017	0.614	Nov 2018	-		0.614	Continuing	Continuing	Continuing
		Subtotal	0.680	0.670		1.139		0.856		-		0.856	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services Prior Years	Various	Various : Various	0.275	0.000		0.000		0.000		-		0.000	0.000	0.275	0.275
Program Management Support - Expeditionary	WR	SSC CH : CHARLESTON, SC	0.330	0.220	Nov 2016	0.244	Nov 2017	0.264	Nov 2018	-		0.264	Continuing	Continuing	Continuing
Program Management Support - Expeditionary	WR	SSC SD : SSC SAN DIEGO	1.091	0.200	Nov 2016	0.250	Nov 2017	0.254	Nov 2018	-		0.254	Continuing	Continuing	Continuing
Program Management Support	Various	Various : Various	5.388	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support - IDS	WR	NSWC : DAHLGREN	4.675	0.300	Jul 2017	0.100	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support - IDS	WR	NSWC : CRANE	1.062	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	12.821	0.720		0.594		0.518		-		0.518	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	44.922	3.353		3.886		3.043		-		3.043	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

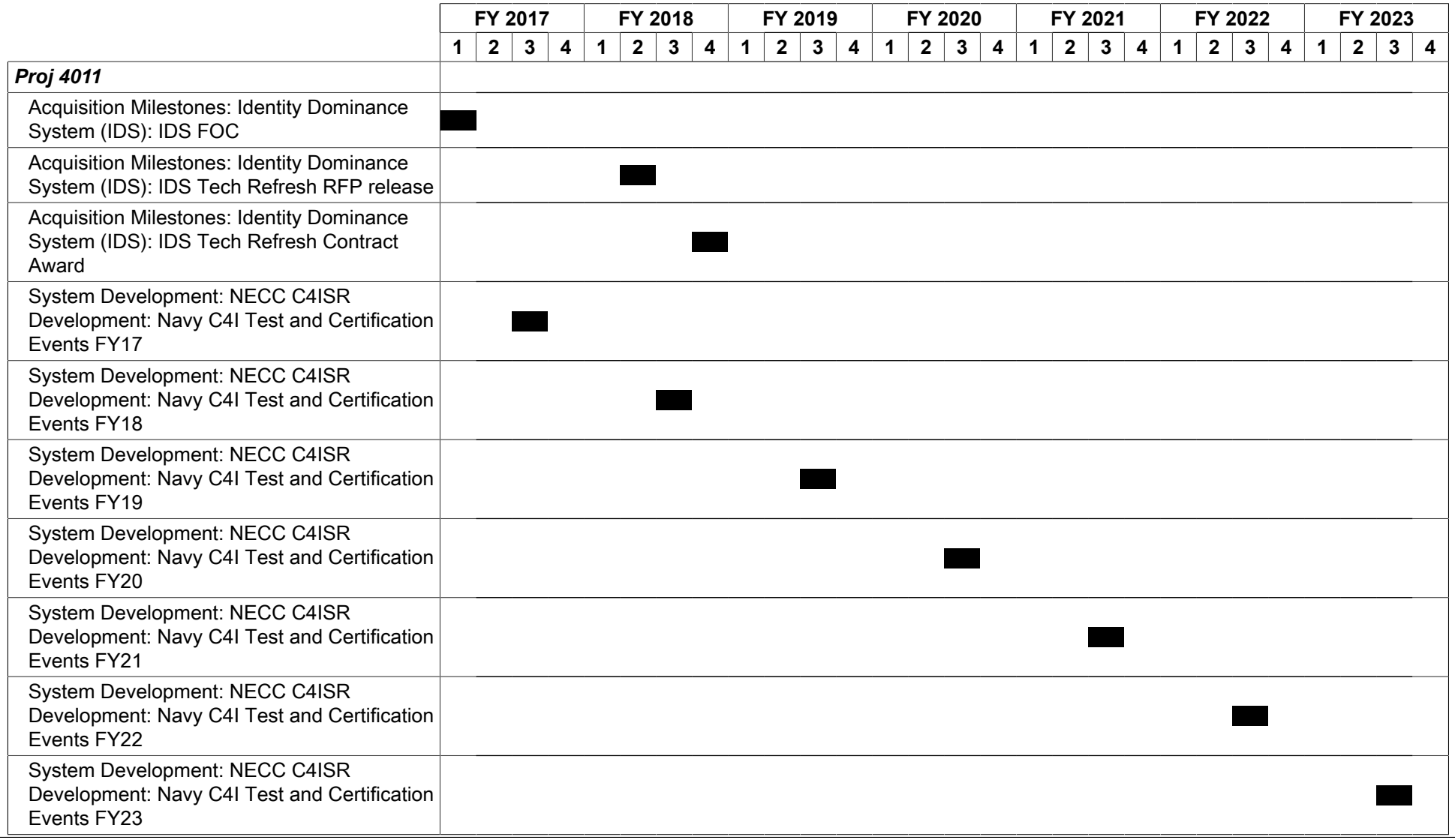


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

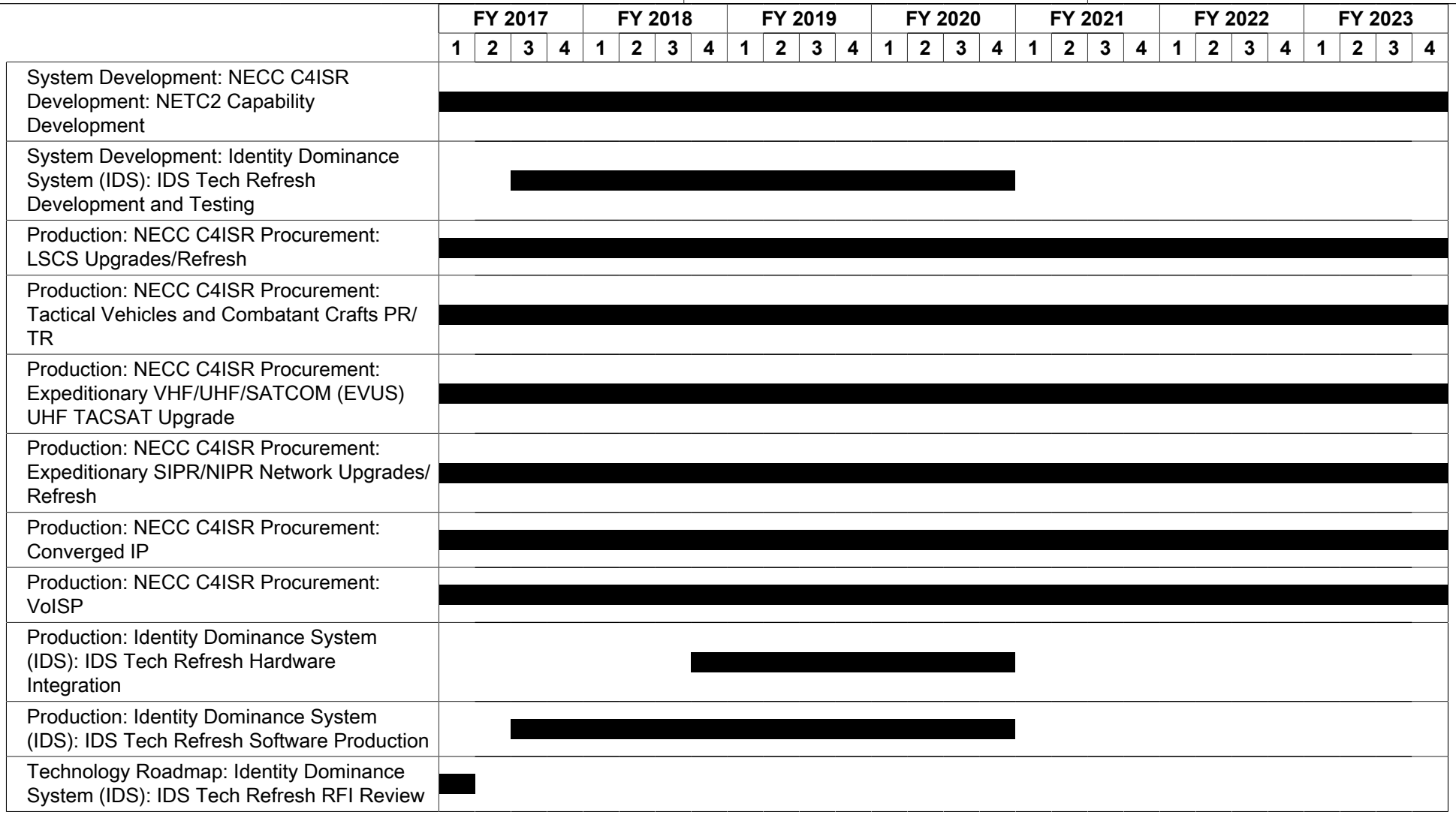


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

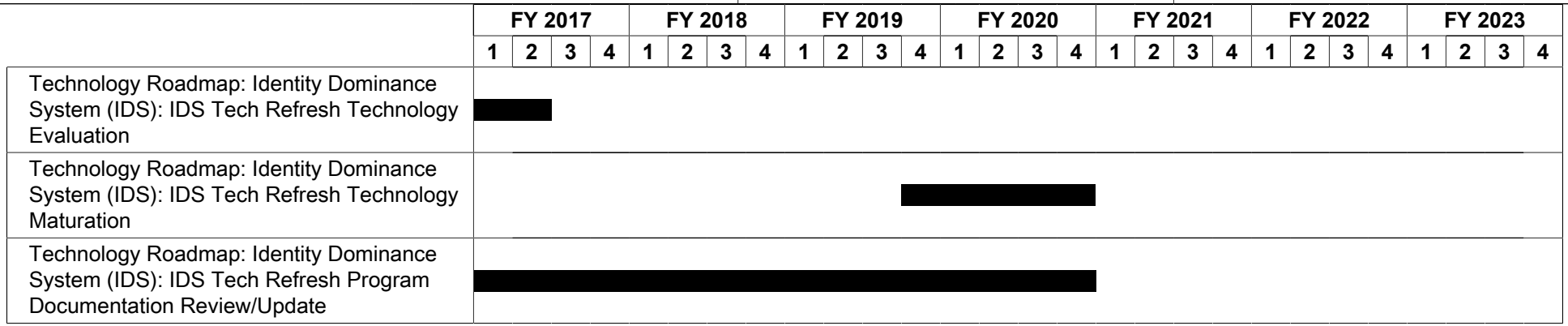


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4011				
Acquisition Milestones: Identity Dominance System (IDS): IDS FOC	1	2017	1	2017
Acquisition Milestones: Identity Dominance System (IDS): IDS Tech Refresh RFP release	2	2018	2	2018
Acquisition Milestones: Identity Dominance System (IDS): IDS Tech Refresh Contract Award	4	2018	4	2018
System Development: NECC C4ISR Development: Navy C4I Test and Certification Events FY17	3	2017	3	2017
System Development: NECC C4ISR Development: Navy C4I Test and Certification Events FY18	3	2018	3	2018
System Development: NECC C4ISR Development: Navy C4I Test and Certification Events FY19	3	2019	3	2019
System Development: NECC C4ISR Development: Navy C4I Test and Certification Events FY20	3	2020	3	2020
System Development: NECC C4ISR Development: Navy C4I Test and Certification Events FY21	3	2021	3	2021
System Development: NECC C4ISR Development: Navy C4I Test and Certification Events FY22	3	2022	3	2022
System Development: NECC C4ISR Development: Navy C4I Test and Certification Events FY23	3	2023	3	2023
System Development: NECC C4ISR Development: NETC2 Capability Development	1	2017	4	2023
System Development: Identity Dominance System (IDS): IDS Tech Refresh Development and Testing	3	2017	4	2020
Production: NECC C4ISR Procurement: LSCS Upgrades/Refresh	1	2017	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 4011 / *Naval Coastal Warfare Surv and C4I Sys*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production: NECC C4ISR Procurement: Tactical Vehicles and Combatant Crafts PR/ TR	1	2017	4	2023
Production: NECC C4ISR Procurement: Expeditionary VHF/UHF/SATCOM (EVUS) UHF TACSAT Upgrade	1	2017	4	2023
Production: NECC C4ISR Procurement: Expeditionary SIPR/NIPR Network Upgrades/ Refresh	1	2017	4	2023
Production: NECC C4ISR Procurement: Converged IP	1	2017	4	2023
Production: NECC C4ISR Procurement: VoISP	1	2017	4	2023
Production: Identity Dominance System (IDS): IDS Tech Refresh Hardware Integration	4	2018	4	2020
Production: Identity Dominance System (IDS): IDS Tech Refresh Software Production	3	2017	4	2020
Technology Roadmap: Identity Dominance System (IDS): IDS Tech Refresh RFI Review	1	2017	1	2017
Technology Roadmap: Identity Dominance System (IDS): IDS Tech Refresh Technology Evaluation	1	2017	2	2017
Technology Roadmap: Identity Dominance System (IDS): IDS Tech Refresh Technology Maturation	4	2019	4	2020
Technology Roadmap: Identity Dominance System (IDS): IDS Tech Refresh Program Documentation Review/Update	1	2017	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604230N / *Warfare Support System*	Project (Number/Name) 9C86 / *Combatant Craft Replacement*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9C86: *Combatant Craft Replacement*	4.640	3.123	2.108	0.682	-	0.682	1.223	1.120	0.886	0.904	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY2019 funding request was reduced by $0.633 million to account for the availability of prior year execution balances.

Navy Expeditionary Combat patrol boat, Fleet Expeditionary Security combatant craft, Underwater Construction Team (UCT) and Explosive Ordnance Disposal (EOD) replacements will provide second generation Multi Mission Craft that will replace in-service Force Protection Large, Force Protection Small, Riverine Patrol Boats (RPBs), Riverine Assault Boats (RABs), Underwater Construction and EOD craft. Boat and craft replacements will: conduct Maritime Security Operations across the full spectrum of naval, joint, and combined operations enabling access and freedom of action throughout the sea-to-shore and inland operating environments as well as conduct maritime Mine Countermeasures (MCM), counter Improvised Explosive Devices (IEDs), Weapons of Mass Destruction (WMD), and all other types of weaponry, for protection of naval and joint assets required for sea control and power projection. Specific mission and capabilities will be identified in an Initial Capabilities Document (ICD), Analysis of Alternatives (AoA), Capabilities Production Document (CPD) and required milestone documentation. RDT&E funding will fund procurement and material solution studies, advanced technology development and studies, design development and test and evaluation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Combatant Craft Replacement	3.123	2.108	0.682	0.000	0.682
Articles:	-	-	-	-	-
Description: The boats and craft in the Navy Expeditionary Combat Command (NECC) fleet are reaching the end of their service lives and will create a capability gap if not replaced. Funding supports design/development and testing of NECC's next generation Expeditionary Combat Patrol Boat or 40 Patrol Boat (40PB) and other NECC craft.					
FY 2018 Plans: Commence phased approach to recapitalize EOD Craft and other NECC Craft through material solution analysis, engineering analysis and advanced technology development studies to include training technologies. Continue science and technology development work to optimize material solutions to fill critical NECC capability gaps.					
FY 2019 Base Plans: Conduct developmental testing and operational test development for 40PB in support of NECC craft recapitalization. Continuing material solution development and advanced technology development as well as					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 9C86 / *Combatant Craft Replacement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
beginning planning, research, analysis, design and development to recapitalize other NECC craft. Continue science and technology development work to optimize material solutions to fill critical NECC capability gaps. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY2018 to FY 2019 reduction funding is in accordance with planned program profile but also includes $0.633 million reduction to account for the availability of prior year execution balances					
Accomplishments/Planned Programs Subtotals	3.123	2.108	0.682	0.000	0.682

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/1210: *Standard Boats (NECC)*	27.450	9.482	11.192	18.360	29.552	11.304	11.412	11.640	11.872	Continuing	Continuing

Remarks

D. Acquisition Strategy

Acquisition of RDT&E developed craft material solution and technology to be accomplished using "tailored" commercial procurements in accordance with a PMS325G approved/OPNAV N95 endorsed NECC Craft Replacement Acquisition Strategy.

E. Performance Metrics

Successfully demonstrate system functionality to support approved requirements and Initial Capabilities Document (ICD).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604230N / *Warfare Support System*	Project (Number/Name) 9C86 / *Combatant Craft Replacement*	

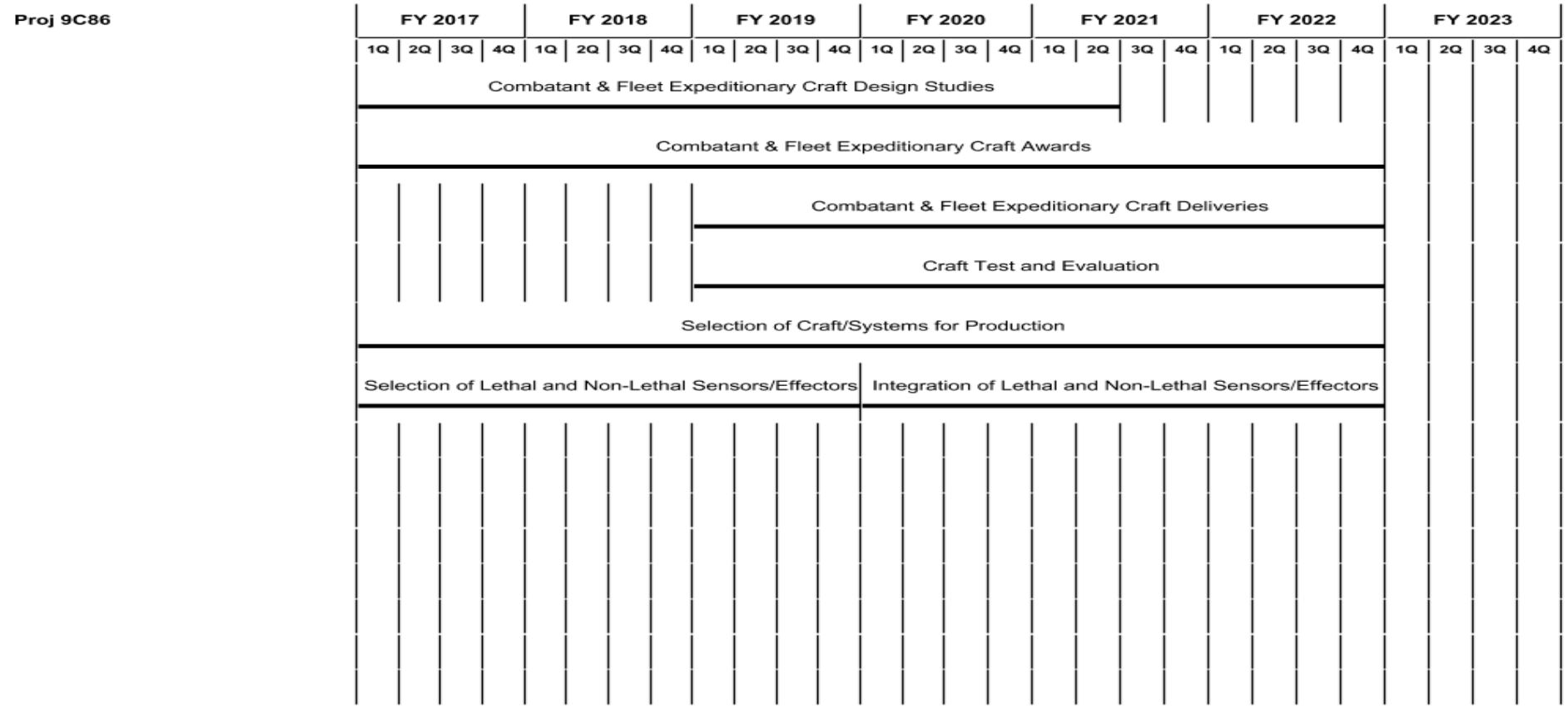
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Craft Feasibility Study	WR	NSWC : Carderock, MD	1.319	0.593	Feb 2017	0.400	Mar 2018	0.130	Mar 2019	-		0.130	Continuing	Continuing	Continuing
Craft Material Solution & Design Development	WR	NSWC : Carderock, MD	1.984	1.937	May 2017	1.308	Mar 2018	0.422	Mar 2019	-		0.422	Continuing	Continuing	Continuing
Craft Study Report	WR	NSWC : Carderock, MD	1.337	0.593	May 2017	0.400	Mar 2018	0.130	Mar 2019	-		0.130	Continuing	Continuing	Continuing
Craft Test and Evaluation	WR	NSWC : Carderock, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	4.640	3.123		2.108		0.682		-		0.682	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.640	3.123		2.108		0.682		-		0.682	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 9C86 / *Combatant Craft Replacement*



2019PB - 0604230N - 9C86

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604230N / *Warfare Support System*	**Project (Number/Name)** 9C86 / *Combatant Craft Replacement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9C86				
Combatant & Fleet Expeditionary Craft Design Studies	1	2017	2	2021
Combatant & Fleet Expeditionary Craft Awards	1	2017	4	2022
Combatant & Fleet Expeditionary Craft Deliveries	1	2019	4	2022
Craft Test and Evaluation	1	2019	4	2022
Selection of Craft/Systems for Production	1	2017	4	2022
Selection of Lethal and Non-Lethal Sensors/Effectors	1	2017	4	2019
Integration of Lethal and Non-Lethal Sensors/Effectors	1	2020	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604231N *I Tactical Command System*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	510.073	36.190	55.695	57.688	-	57.688	58.544	49.683	32.230	25.480	Continuing	Continuing
0486: *Tactical Support Center*	129.472	5.158	5.665	4.645	-	4.645	6.112	6.024	5.751	5.873	Continuing	Continuing
3032: *NTCSS (Naval Tactical Command Spt Sys)*	84.713	13.192	4.044	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	101.949
3260: *Naval Operations Business Logistics Enterprise (NOBLE)*	0.000	0.000	19.102	37.792	-	37.792	40.653	31.817	14.126	6.940	Continuing	Continuing
3323: *Maritime Tactical Command & Control (MTC2)*	45.833	14.023	17.487	12.038	-	12.038	8.888	9.099	9.335	9.588	Continuing	Continuing
3324: *Navy Air Operations Command and Control (NAOC2)*	13.081	0.963	1.048	1.004	-	1.004	0.710	0.518	0.747	0.763	Continuing	Continuing
3425: *Digital Warfare*	0.000	0.000	5.950	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.950
9123: *FORCEnet*	236.974	2.854	2.399	2.209	-	2.209	2.181	2.225	2.271	2.316	Continuing	Continuing

Note

The FY 2019 funding request was reduced by $2.000 million to account for the availability of prior year execution balances

A. Mission Description and Budget Item Justification

The Tactical Command System upgrades the Navy's Command, Control, Communications, Computer and Intelligence (C4I) systems and processes C4I information for all warfare mission areas including planning, direction and reconstruction of missions for peacetime, wartime and times of crises.

Tactical Support Center: The Tactical Mobile program provides agile evolutionary systems and equipment upgrades to support the Maritime Patrol and Reconnaissance Force Commanders with the capability to plan, direct and control the tactical operations of Maritime Patrol and Reconnaissance Aircraft and other assigned units within their respective area of responsibility. Looking ahead, TacMobile provides critical mission planning and reach-back capabilities between the Maritime Patrol and Reconnaissance Aircraft, primarily the P-8A/Poseidon, and MQ-4C/Triton, and the Maritime Intelligence Surveillance and Reconnaissance Enterprise. These operations include littoral, open ocean, and over land long-dwell surveillance, anti-surface warfare, over-the-horizon targeting, counter-drug operations, power projection, antisubmarine warfare, mining, search and rescue, indications and warning, realtime full motion video collection and streaming/dissemination, and special operations. The missions are supported by Tactical Operations Centers, Mobile Tactical Operations Centers, and Fly Away Kits.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*

Naval Tactical Command Support System (NTCSS): The NTCSS is a multi-function program designed to provide standard tactical support information systems to various afloat and associated shore-based fleet activities. The mission is to provide the Navy and Marine Corps with an integrated, scalable system that supports the management of logistical information, personnel, material and funds required to maintain and operate ships, submarines, and aircraft.

The Naval Operational Business Logistics Enterprise (NOBLE) family of programs will provide direct support to warfighter readiness with maintenance, supply, and personnel administration capabilities using an open architecture framework that incorporates business process re-engineering (BPR) allowing for the consolidation of over 23 standalone application systems. These capabilities include enhanced situational awareness, planning, execution, personnel administration, and management of maintenance and supply logistics and business functions to ships/submarines, aviation squadrons, shore operational sites, and expeditionary units with a total user base exceeding 150,000. NOBLE will meet current and emerging demands for cyber, Financial Improvement and Audit Readiness (FIAR), Navy logistics and maritime maintenance mission requirements, and eliminate over 700 application/database servers. NOBLE will deploy to Navy Enterprise Data Centers (NEDC) ashore, the Consolidated Afloat Networks and Enterprise Services (CANES) afloat, and Department of the Navy (DON) commercial cloud computing environments.

Maritime Tactical Command and Control (MTC2) is the next generation Command and Control (C2) solution that will deliver Battle Management Aids (BMA) and Maritime Planning Tools (MPT) to dynamically plan, direct, monitor, and assess maritime operations in support of Joint, Multi-Service, Coalition Forces planning. MTC2 will leverage a System of Services (SoServ) to deliver capabilities improving decision speed and dynamic synchronization of forces. BMAs / MPTs are small, capability-focused deliveries that can be rapidly developed, tested, and fielded. MTC2 will engage with the Office of the Chief of Naval Operations (OPNAV)-led Requirements Governance Board to define and prioritize the BMAs and MPTs that MTC2 will deliver and align to the Program Executive Office (PEO) Command, Control, Communications, and Intelligence (C4I) enterprise architecture (Consolidated Afloat Network Enterprise Service (CANES), Agile Core Services (ACS)) for fielding to all echelons of command (Afloat and Ashore) within the Navy. The program's objective is to provide a suite of maritime applications (BMAs / MPTs) that enable planning, execution, monitoring, and assessment in support of operational and tactical level of war requirements. MTC2 will field BMAs / MPTs designed to provide automated and structured support for tactical and operational planning, decision-making, and execution. MTC2 will incorporate distributed data transfer capability for enhanced operational data exchange between command and control systems, combat systems, logistics, and intelligence systems for timely threat identification, location, and status alongside blue force data. MTC2 will fulfill a portion of the Navy's Global Force Management - Data Initiative (GFM-DI) requirements. GFM-DI is the Department-wide enterprise solution that enables visibility/accessibility/sharing of data applicable to the entire Department of Defense (DoD) force structure.

Navy Air Operations Command and Control (NAOC2): NAOC2 integrates and tests Air Force program of record systems that provide an integrated and scalable planning system for standardized, secure, and automated decision support for Air Force, Joint, and Allied commanders worldwide. These programs provide automated air operations planning, execution management and intelligence capabilities at the Force level to include fleet commanders, numbered fleet commanders, Commander Carrier Strike Groups, Commander Expeditionary Strike Groups, Commander Landing Forces, and Joint Task Force Commanders. NAOC2 includes Theater Battle Management Core System (TBMCS) and Command and Control Air Operations Suite - Command and Control Information Services (C2AOS-C2IS). C2AOS-C2IS is comprised of multiple projects incorporated into three Capability Packages and will deploy to a Service Oriented Architecture (SOA) enterprise environment that aligns with the Joint C2 Reference Architecture (JC2RA) such as Consolidated Afloat Networks and Enterprise Services (CANES). C2AOS-C2IS is not natively compatible with Navy Information Technology (IT) infrastructure, such as CANES, and requires a significant level of system integration. Continuation of Navy integration and test efforts will significantly enhance the ability of the Joint Force Air Component Commander and Combined Air Operations Center personnel to plan daily air operations including

strike, airlift, offensive/defensive air, missile defense, and refueling missions in support of combat operations. C2AOS-C2IS addresses the requirement of war fighter distributed planning and execution processes along with significantly improving Joint interoperability. TBMCS continues a hardware transition to CANES. Currently, TBMCS is the key system that is used to conduct real world air planning in the Joint and Navy environments. C2AOS-C2IS will replace TBMCS while bringing more flexibility to the war fighter.

Digital Warfare (DW): Supports system of systems requirements modeling and allocation, development of data technical baselines, digital architectures and data models, and provides data science for enterprise and warfare pilots in support of a composeable, modular Navy.

Funding for the Digital Warfare (DW) requirements has been realigned to PE 0604027N beginning in FY19.

FORCEnet: The mission of this effort is to deliver Information Dominance by (a) accelerating the transformation to a Distributed, Networked force; (b) achieve interoperability based on Architectures and Standards; and (c) Experiment with, evaluate and employ the enabling technologies. Effort is a non-acquisition program that is the operational instantiation of FORCEnet. The end-state is a distributed network of weapons, sensors, Command and Control (C2), platforms and warriors.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	40.323	55.695	71.345	-	71.345
Current President's Budget	36.190	55.695	57.688	-	57.688
Total Adjustments	-4.133	0.000	-13.657	-	-13.657
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.750	0.000			
• SBIR/STTR Transfer	-0.863	0.000			
• Program Adjustments	-4.000	0.000	-12.760	-	-12.760
• Rate/Misc Adjustments	0.000	0.000	-0.897	-	-0.897
• Congressional General Reductions Adjustments	-0.020	-	-	-	-

Change Summary Explanation

Technical: Not applicable.

Schedule:

Tactical Support Center (Project 0486):

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604231N *I Tactical Command System*

FY2019 funding provides critical funds for Systems Engineering and Primary Hardware Development as TacMobile approaches Critical Design Review (CDR) for Increment 3, to support ACAT I P-8A Increment 3 Developmental and Integrated Test events beginning in FY19. Specific efforts include developing TacMobile capabilities for P-8A Applications Based Architecture (ABA) and building a TacMobile Engineering Development Model with appropriate P-8A interfaces to enable and test net-ready applications, mission planning and post-flight test threads; Development of a TacMobile interface for P-8A Anti-Submarine Warfare (ASW) Signals Intelligence (SIGINT); Engineering, development and integration of Multiple Security Level enclaves, and a common solution to remain interoperable with P-8A security interfaces. NAVAIR has assumed the lead systems integrator role for design and development of P-8A Increment 3 and therefore there will be heavy reliance upon TacMobile to align to and be an integral part of Developmental and Integrated test events for P-8A to meet critical aircraft integration and testing milestones.

Navy Air Operations Command and Control (NAOC2)(Project 3324):
To more accurately reflect the correlation between the USAF and United States Navy (USN) schedules, the schedule has also been revised to better capture the joint USAF/USN events, to include replacement of the Navy Operational Test (OT) events with Multi-Service Operational Test & Evaluation (MOT&E) events. The previous Navy integration and testing efforts are now captured through Navy's participation in Joint (USAF/USN) Test and Integration activities. Schedule has also been updated to reflect removal of Capability Package (CP) 4 and C2AOS-C2IS Modernization (formerly CP5).

A proposed targeted baseline of IT Components which was referred to as the Navy's Agile Core Services (ACS) has been replaced by the Air Force's Command & Control Software Baseline (C2SB). C2AOS-C2IS does not seamlessly integrate into Navy IT infrastructures and additional integration and test efforts, to include participation in Consolidated Afloat Networks and Enterprise Services (CANES) System Integration Test (SIT) events, are required to ensure C2AOS-C2IS configuration/compatibility with C2SB. With USAF replacement of ACS with C2SB, Navy has added additional test and integration efforts to transition C2AOS-C2IS back into ACS post-delivery of the USAF C2AOS-C2IS product.

Funding:

Naval Tactical Command Support System (NTCSS) (Project 3032):
Funding in Project 3032 ceases in FY2019 as NTCSS transitioned development of tactical support information systems to the Naval Operational Business Logistics Enterprise (NOBLE).

Naval Operational Business Logistics Enterprise (NOBLE) (Project 3260):

FY2019 funding increase supports:
Naval Operational Supply System (NOSS): Increase to full software development capacity for eleven months until completion of software development efforts and delivery of Software Build 1 (BLD 1). Commence Developmental Test and Evaluation (DT&E) efforts for BLD 1.

Naval Aviation Maintenance System (NAMS): Conduct NAMS Milestone B/C review. Award NAMS BLD 1 contract. Initialize software development efforts and increase to full software development capacity for eleven months in support of BLD 1.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604231N *I Tactical Command System*

Naval Operational Maintenance Enterprise (NOME): Conduct Milestone B/C review. Award NOME BLD 1 contract. Initialize software development efforts for two months in support of BLD 1.

Naval Administration and Personnel System (NAPS): FY2018 funding planned to commence pre-acquisition efforts in support of Analysis of Alternatives (AoA) study. Upon completion, additional funding and efforts will be on hold pending the identification of functional manager to validate program requirements.

Maritime Tactical Command and Control (MTC2) (Project 3323):
FY2018 to FY2019 funding for MTC2 decreases due to direction to align to the new program scope per the Strategic Shift Memo from the Office of the Chief of Naval Operations (OPNAV) dated 28 NOV 2016. In order to meet OPNAV's redirection, the program was required to re-baseline in order to focus on delivery of Battle Management Aids (BMA) / Maritime Planning Tools (MPT).

Digital Warfare (Project 3425)
Funding decrease due to realignment of FY19 funds to the DW PE (0604027N) beginning in FY19.

FORCEnet (Project 9123)
From FY18 to FY19 funding decreases due to the completion of Navy Cybersecurity Situational Awareness (NCSA) analytical support.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy									Date: February 2018			
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*				Project (Number/Name) 0486 / *Tactical Support Center*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
0486: *Tactical Support Center*	129.472	5.158	5.665	4.645	-	4.645	6.112	6.024	5.751	5.873	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

TacMobile brings Enterprise Command, Control, Communications, Computers and Intelligence, Surveillance and Reconnaissance (C4ISR) to the Maritime Patrol and Reconnaissance Force (MPRF) community.

TacMobile is a long-running, multi-year acquisition program which provides Command, Control, Communications, Computers, and Intelligence (C4I) for Navy's Maritime Patrol and Reconnaissance Force (MPRF). From within Tactical Operations Centers (TOC) at well-supported airfields, TacMobile provides theater Anti-Submarine Warfare (ASW) and Intelligence Surveillance Reconnaissance (ISR) commanders a common tactical picture while providing pre-flight and post-flight support to manned and unmanned MPRF aircraft. From within Mobile Tactical Operations Centers (MTOC), TacMobile supports manned MPRF aircraft at the tactical edge of operations. TacMobile Fly-Away Kits (FAK) support manned MPRF aircraft in short-duration expeditionary settings.

Services provided include analysis and correlation of diverse sensor information; data management support; command decision aids; rapid data communication; mission planning, evaluation and reach-back dissemination of surveillance data and threat alerts to operational users ashore and afloat, and to the Maritime Intelligence Surveillance and Reconnaissance Environment.

TOCs provide Command, Control, Communications, Computers and Intelligence (C4I) capability, air-ground, satellite and point-to-point communications systems; sensor analysis capabilities; avionics and weapons system interfaces and facilities equipment. MTOCs are scalable, mobile versions for operations from remote forward operating airfields. FAKs provide additional agility for expeditionary short-term duration aircraft detachments. This program assures that existing TOCs and MTOCs are interoperable to fulfill their operational requirements. TOC/MTOC will continue to provide the ground Command and Control missions, reach-back and C4I interfaces for the MPRF Family of Systems (FOS) aircraft and systems evolution including P-8A Multi-mission Maritime Aircraft (MMA) baseline and Increment 2, and the development of future C4I support capabilities for the P-8A Poseidon Increment 3, Advanced Airborne Sensor (AAS), and the MQ-4C TRITON Unmanned Aerial System.

The TacMobile program follows an evolutionary acquisition approach for adding capabilities that maintain and support MPRF weapons systems. Current requirements for TacMobile are to adapt to a smaller lightweight scalable Network-centric Services Oriented Architecture (SOA) configuration. Additional TacMobile requirements are to simplify and streamline the Pre-Flight Insertion Data (PID) process for mission aircraft, and to satisfy the need for sensor data sharing between aircraft and the Maritime Intelligence Surveillance and Reconnaissance Enterprise.

FY19: Funding supports core TacMobile systems engineering, development and testing of Increment 3, and Technical Refresh to Increment 2.1, to maintain interoperability with P-8A Poseidon and the MQ-4C Triton. Specifically this development is aligned to support P-8A Inc 3 Block 2 Integrated Testing beginning in FY19, increase modularity, establish additional security enclaves and reduce footprint to offset the size/weight/power/cooling (SWaP-C) of additional required aircraft interfaces developed to support P-8A Increment 3, Advanced Airborne Sensor (AAS) and emerging Maritime Patrol and Reconnaissance Aircraft operations. Network-centric Services Oriented Architecture (SOA) and airborne C4I integration efforts continue to ensure interoperability with emerging MPRF Aircraft and Sensors, streamline Pre-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

Flight Insertion Data (PID), facilitate the MPRF ISR and ASW data processing - Exploitation - Dissemination (PED) process, and reduce TacMobile footprint, enhancing mobility capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Net Ready	0.938	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Cost has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0." ***FY 2019 Base Plans:*** Cost has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0." ***FY 2019 OCO Plans:*** N/A					
Title: Tactical Mobile Acoustic Support System (TACMASS)	0.736	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 Base Plans:*** "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 OCO Plans:*** N/A					
Title: Aircraft Interfaces	0.883	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 Base Plans:*** "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 OCO Plans:*** N/A					
Title: Tactical Data Links	0.160	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 Base Plans:*** "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 OCO Plans:*** N/A					
Title: Enterprise Solutions	0.880	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 Base Plans:*** "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 OCO Plans:*** N/A					
Title: Command and Control (C2)	0.607	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 Base Plans:*** "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 OCO Plans:*** N/A					
Title: Maritime Patrol and Reconnaissance Force (MPRF) Interoperability/TacMobile Footprint Reduction	0.954	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: "Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
"Cost" has been consolidated under "TacMobile Increment 2.1" and "TacMobile Inc 3.0". ***FY 2019 OCO Plans:*** N/A					
Title: TacMobile Increment 2.1 ***Articles:*** ***FY 2018 Plans:*** - Effort previously funded under "Net Ready", "Tactical Mobile Acoustic Support System (TACMASS)", "Aircraft Interfaces", "Tactical Data Links", "Enterprise Solutions", and "MPRF Interoperability/TacMobile Footprint Reduction". Begin phased design and engineering of Technical refresh 2.1.2, including P-8A/Poseidon and MQ-4C/Triton interoperability related communications upgrades (Global broadcast System (GBS), Super High Frequency (SHF) and Tactical Data Links (TADIL); Command, Control, Communications and Intelligence (C4I) enhancements (Common Operational Picture (COP) and Integrated Broadcast Service (IBS)), and appropriate subsystem refreshes based on P-8A and MQ-4 collaborative efforts. These efforts include: INTEROPERABILITY: Continue Automated Digital Network System (ADNS) and Full Motion Video implementations following external stakeholder transition to ADNS Inc 3 infrastructure - (TR 2.1.1/2.1.2). SYSTEM UPGRADES: Continue design model development of automated TacMobile system functionality to reduce operator workload, and offset increasing Maritime Patrol and Reconnaissance Force Intelligence Surveillance and Reconnaissance Mission/Function/Task - (TR 2.1.1); Implement fleet change requests into TR 2.1.2 - (TR 2.1.2); Complete design and integration for selected Joint Tactical Radio System (BU-2) - (TR 2.1.2). MODERNIZATION: Complete integration of follow on Ultra High Frequency (UHF) /Very High Frequency (VHF) Satellite Communications (SATCOM) sub system - (TR 2.1.1); Evaluate options for Global Broadcast System subsystem modernization - (TR 2.1.2); Evaluate options for SHF subsystem modernization - (TR 2.1.2); Evaluate options for Tactical Data Links modernization - (TR 2.1.2); Complete requirements analysis, assess options, and begin integration of solutions to modernize or replace current generation Global Command and Control System Maritime - (TR 2.1.2). ***FY 2019 Base Plans:*** Complete phased design and engineering of Technical refresh 2.1.2, including P-8A/Poseidon and MQ-4C/ Triton interoperability related communications upgrades (Global Broadcast System (GBS), Super High Frequency (SHF) and Tactical Data Links (TADIL); Command, Control, Communications and Intelligence (C4I) enhancements (Common Operational Picture (COP) and Integrated Broadcast Service (IBS)), and appropriate subsystem refreshes based on P-8A and MQ-4C collaborative efforts. These efforts include: INTEROPERABILITY: Complete Automated Digital Network System (ADNS) and Full Motion Video	0.000 -	2.181 -	0.991 -	0.000 -	0.991 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
implementations following external stakeholder transition to ADNS Inc 3 infrastructure - (TR 2.1.1/2.1.2). SYSTEM UPGRADES: Continue design model development of automated TacMobile system functionality to reduce operator workload, increase agility with Size / Weight /Power/Cooling (SWaP-C) reductions, and offset increasing Maritime Patrol and Reconnaissance Force Intelligence Surveillance and Reconnaissance Mission/Function/Task - (TR 2.1.2); Implement fleet change requests into Technical Refresh 2.1.2 - (TR 2.1.2). MODERNIZATION: Integrate selected option for Global Broadcast System subsystem modernization - (TR 2.1.2); Integrate selected option for SHF subsystem modernization - (TR 2.1.2); Complete communications upgrade design/integration/development for P-8A interoperability and optimization: Common Data Link Upgrades, Broadcast Intelligence Analysis, Joint Range Extension, Third Party Targeting, High Frequency Internet Protocol, Link 16 updates, and Wideband SatCom design/technology implementation - (TR 2.1.2); Complete integration of selected solution to modernize or replace current generation Global Command and Control System Maritime - (TR 2.1.2); Integrate next generation Mass Storage solution - (TR 2.1.2). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease for TacMobile Increment 2.1 development is due to reduced effort associated with ramp down of TR 2.1.1 development, integration and test, and transition to TR 2.1.2 development, integration and test.					
Title: TacMobile Increment 3.0 ***Articles:*** ***FY 2018 Plans:*** Effort previously funded under "Net Ready", "Tactical Mobile Acoustic Support System (TACMASS)", "Aircraft Interfaces", "Tactical Data Links", "Enterprise Solutions", and "MPRF Interoperability/TacMobile Footprint Reduction". Complete updates to Increment 3 Capabilities Production Document (CPD) based upon Joint Requirements Oversight Council (JROC) and Fleet review. These efforts include: INTEROPERABILITY: Design and develop TacMobile architecture for P-8A Applications Based Architecture (ABA) interface. Build Engineering Development Model (EDM) with appropriate P-8A ABA interface to enable net ready application - (Inc 3.0); Complete TacMobile Data Strategy and Information Support Plan for Increment 3.0, supporting P-8A Poseidon Inc 3 - (Inc 3.0); Design and develop TM architecture/interface for P-8A Anti -Submarine Warfare (ASW) Signals Intelligence (SIGINT) and track management requirements in support of P-8A mission systems - (Inc 3.0); Mature requirements development for Multistatic Active Coherent (MAC) Enhancements (MAC-E) and commence design for MAC-E integration - (Inc 3.0); Continue communications upgrade design/ integration/development for P-8A interoperability and optimization: Common Data Link Upgrades, Broadcast	0.000 -	3.484 -	3.654 -	0.000 -	3.654 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Intelligence Analysis, Joint Range Extension, Third Party Targeting, High Frequency Internet Protocol, Link 16 updates, and Wideband SatCom design/technology implementation - (Inc 3.0); Further mature architecture, development and integration of Multiple Security Level enclaves or common solution to remain interoperable with P-8A security interfaces - (Inc 3.0); Interface with Intelligence community to define Processing, Exploitation, and Dissemination CONOPS and reach-back support requirements for integrating the wide range of P-8A missions and Anti-Submarine Warfare and Intelligence Surveillance and Reconnaissance data elements with the Maritime Intelligence Surveillance and Reconnaissance Environment. Implement data strategy with automation, Services Oriented Architecture (SOA), and other schemas for increased interoperability and efficiency - (Inc 3.0); Develop TacMobile environment to align with Family of Systems Community of Interest data management model schema - (Inc 3.0); Finalize Tactical Operations Center (TOC)/Mobile Tactical Operations Center (MTOC) Operational view and System view Department of Defense Architecture Framework (DoDAF) products and align with the Maritime Patrol and Reconnaissance Force /Air Anti-Submarine Warfare Community of Interest Family of Systems Department of Defense Architecture Framework products - (Inc 3); Continue integration of Navy enterprise solutions for Common Operational Picture (COP) management (in synch with Distributed Common Ground System Navy (DCGS-N), Undersea Warfare-Decision Support System (USW-DSS)) - (Inc 3.0). SYSTEM UPGRADES: Continue building Engineering Development Model with interfaces to P-8A system upgrades and TacMobile Multiple Independent Levels of Security - (Inc 3.0); Implement fleet and engineering change requests into Inc 3 design - (Inc 3.0). MODERNIZATION: Continue integration of next generation Mass Storage solution - (Inc 3.0); Continue integration of enterprise solutions for Multiple Security Level networks - (Inc 3.0); Complete Services Oriented Architecture (SOA) requirements analysis. Begin TM modernization development efforts to integrate SOA architecture - (Inc 3.0); Continue stakeholder Size Weight Power and Cooling (SWaP-C) design analysis and integrate SWaP-C reductions into TOC/MTOC design - (Inc 3.0).					
FY 2019 Base Plans: INTEROPERABILITY: Finalize Engineering Development Model (EDM) design to include appropriate interfaces for P-8A - (Inc 3.0); Finalize design for Multiple Security Level enclaves and joint system security architecture for P-8A interoperability - (Inc 3.0); Finalize EDM architecture to support Navy Tasking, Collection, Processing, Exploitation, and Dissemination CONOPS and data reach-back requirements for integrating the wide range of P-8A missions and Anti-Submarine Warfare and Intelligence Surveillance and Reconnaissance data elements with the Maritime Intelligence Surveillance and Reconnaissance Environment - (Inc 3.0); Finalize EDM design and data strategy to maximize automation, Services Oriented Architecture (SOA), virtualization for increased interoperability and efficiency - (Inc 3.0); Finalize TacMobile design and implementation of metadata tagging and content management to align with Family of Systems Community of Interest data management model schema - (Inc 3.0); Continue maturing requirements development for Multistatic Active Coherent (MAC)					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Enhancements (MAC-E). Commence design and development of EDM upgrade for MAC-E integration. Integrate enhanced TacMobile data analysis tools and applications to support P-8A MAC-E interoperability - (Inc 3.0); Complete TacMobile Increment 3.0 Data Strategy and Information Support Plan to support Navy Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) and Net-Centric strategies as well as to support P-8A Poseidon Inc 3, MQ-4C Triton Multi-INT, and Advanced Airborne Sensor (AAS) operations - (Inc 3.0); Finalize integration of Navy enterprise solutions for network services and Common Operational Picture (COP) management (in synch with Distributed Common Ground System Navy (DCGS-N), Undersea Warfare-Decision Support System (USW-DSS)) - (Inc 3.0); Finalize s/w development for sortie management and data services to interface with P-8A media build - (Inc 3.0); Conduct developmental testing to evaluate design and P-8A interfaces interoperability - (Inc 3.0); Conduct testing to achieve system Cybersecurity certifications and accreditations - (Inc 3.0). SYSTEM UPGRADES: Implement fleet and engineering change requests into Inc 3 design - (Inc 3.0); Implement hardware upgrades to address obsolescence and technological changes that do not impact system capability - (Inc 3.0). MODERNIZATION: Implement Size Weight Power and Cooling (SWaP-C) reductions into final EDM design and proposed TOC/MTOC design - Inc 3.0). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding slight increase for TacMobile Increment 3.0 development is due to transition from Requirements definition, analysis, and Joint Capabilities Integration and Development System (JCIDS) document development, to Systems Engineering Development.					
Accomplishments/Planned Programs Subtotals	5.158	5.665	4.645	0.000	4.645

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2906: *TacMobile*	23.908	40.325	42.010	-	42.010	28.020	29.660	29.952	30.555	Continuing	Continuing

Remarks

Maritime Patrol & Reconnaissance Force (MPRF) Mission Support Systems

D. Acquisition Strategy

Evolutionary Acquisition - Increment 2.0 provided enhanced Beyond Line of Sight (BLOS) Global Information Grid (GIG) reach back capability, and supports Maritime Situational Awareness connectivity enhancements for data exchange with Maritime Patrol and Reconnaissance Force (MPRF) aircraft and with Coalition data networks.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

It incorporated Anti-Submarine Warfare (ASW) acoustical analysis improvements and new P-3C aircraft ASW interfaces. Increment 2.1 supported migration to follow on Global Command and Control System - Maritime (GCCS-M) version 4.0.3 and introduction of the P-8A Poseidon. Tech Refresh 2.1.1 supports technical engineering changes associated with the introduction of P-8A Poseidon Increment 2, MQ-4C Triton, Advanced Airborne Sensor (AAS), migration to GCCS-M 4.1 Group Level, and transition to WIN10 baselines. Increment 3 will incorporate support for other Maritime Patrol and Reconnaissance Force (MPRF) Family of Systems (FOS) Aircraft Systems, as they transition to a Services Oriented Architecture (SOA).

E. Performance Metrics

The primary metrics utilized by the TacMobile program development process include achieving/maintaining all required Interface Exchange Requirements (IER's) and successful achievement of 100% of Key Performance Parameters for incremental upgrade threshold capabilities, as observed by Commander Operational Test Force representatives during Operational Evaluation. TacMobile Inc 2.1 development supported increased IER requirements of 486% from 112 to 544. Development to support these new IER's tapered off in FY-12 as the Increment entered the Operational Evaluation Phase. Development focus then shifted to efforts required to retain fielded IER's and update IER's to comply with emerging and evolving standards associated with P-8A Poseidon Increment 2, and the MQ-4C Triton Unmanned Aerial System (UAS), other Maritime Patrol and Reconnaissance Force (MPRF) Family of Systems (FOS) Aircraft and Systems, and evolving operational employment concepts. Increment 3 development will increase IER's by extending the TacMobile core to extend integrated capabilities into Higher Than SECRET enclaves and Services Oriented Architecture (SOA). The quantification of the increase in IER's will be dependent upon final requirements which are still being defined.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 0486 / *Tactical Support Center*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPFF	SSC LANT; TAPESTRY; CENTURUM : Charleston; SC; Pax River, MD	10.301	1.344	Dec 2016	1.878	Dec 2017	1.457	Dec 2018	-		1.457	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	SSC LANT; TAPESTRY; CENTURM, BAH, Sentek : Charleston, SC; Pax River, MD; San Diego, CA	33.429	1.265	Dec 2016	1.830	Dec 2017	1.378	Dec 2018	-		1.378	Continuing	Continuing	Continuing
Training Development	C/CPFF	SSC LANT; TAPESTRY; CENTURUM, Sentek : Charleston, SC; Pax River, MD; San Diego, CA	3.161	0.300	Dec 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development	C/CPFF	SSC LANT, TAPESTRY, CENTURUM, BAH, Sentek : Charleston, SC; Pax River, MD; San Diego, CA	47.906	0.602	Dec 2016	0.900	Dec 2017	0.700	Dec 2018	-		0.700	Continuing	Continuing	Continuing
Integrated Logistics Support	C/CPFF	SSC LANT, TAPESTRY; CENTURUM : Charleston, SC; Pax River, MD	1.700	0.225	Dec 2016	0.035	Dec 2017	0.035	Dec 2018	-		0.035	Continuing	Continuing	Continuing
Configuration Management	C/CPFF	SSC LANT, TAPESTRY; CENTURUM : Charleston, SC; Pax River, MD	1.325	0.175	Dec 2016	0.046	Dec 2017	0.023	Dec 2018	-		0.023	Continuing	Continuing	Continuing
Technical Data	C/CPFF	SSC LANT, TAPESTRY; CENTURUM :	1.700	0.220	Dec 2016	0.251	Dec 2017	0.251	Dec 2018	-		0.251	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 0486 / *Tactical Support Center*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Charleston, SC; Pax River, MD													
Studies & Analyses	C/CPFF	SSC LANT, TAPESTRY, CENTURUM, Sentek : Pax River, MD; San Diego CA	1.025	0.100	Dec 2016	0.015	Dec 2017	0.015	Dec 2018	-		0.015	Continuing	Continuing	Continuing
		Subtotal	100.547	4.231		4.955		3.859		-		3.859	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	C/CPIF	SSC LANT; TAPESTRY; CENTURUM : Charleston, SC; Pax River, MD	3.116	0.340	Dec 2016	0.336	Dec 2017	0.436	Dec 2018	-		0.436	Continuing	Continuing	Continuing
Operational Test & Evaluation	MIPR	OPTEVFOR; SSC LANT; TAPESTRY; CENTURUM : Jacksonville, FL	6.020	0.157	Dec 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	9.136	0.497		0.336		0.436		-		0.436	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPIF	TAPESTRY; CENTURUM; BAH; Sentek : Pax River, MD; Charleston, SC; San Diego, CA	3.205	0.215	Dec 2016	0.195	Dec 2017	0.195	Dec 2018	-		0.195	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 0486 / *Tactical Support Center*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	SSC LANT : Charleston, SC	2.193	0.134	Dec 2016	0.107	Dec 2017	0.107	Dec 2018	-		0.107	Continuing	Continuing	Continuing
Program Management Support	C/CPIF	SSC LANT; PMW 750; BAH; TAPESTRY; CENTURUM; Sentek : Charleston, SC; San Diego, CA	14.127	0.063	Dec 2016	0.047	Dec 2017	0.023	Dec 2018	-		0.023	Continuing	Continuing	Continuing
Travel	WR	PMW750 : San Diego, CA	0.264	0.018	Dec 2016	0.025	Dec 2017	0.025	Dec 2018	-		0.025	Continuing	Continuing	Continuing
		Subtotal	19.789	0.430		0.374		0.350		-		0.350	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	129.472	5.158		5.665		4.645		-		4.645	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

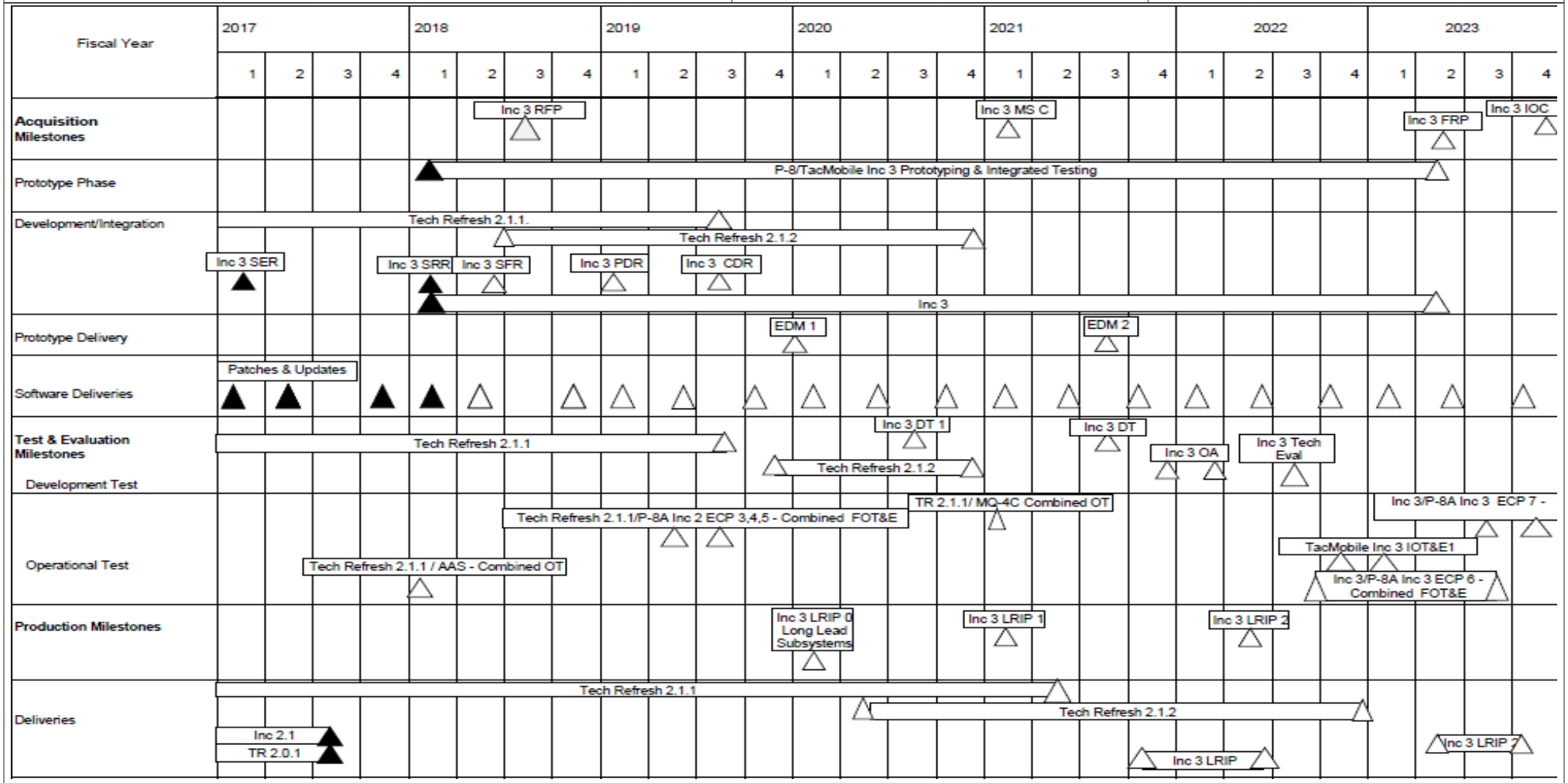


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0486				
Software Delivery (Quarterly)	1	2017	4	2023
Tech Refresh Delivery (TR 2.1.1)	1	2017	2	2021
Tech Refresh Delivery (TR 2.1.2)	2	2020	4	2022
Combined Operational Test (Tech Refresh 2.1.1)	1	2018	1	2021
Development (TR 2.1.1)	1	2017	3	2019
Development (TR 2.1.2)	3	2018	4	2020
Developmental Test (Tech Refresh 2.1.1)	1	2017	3	2019
Developmental Test (Tech Refresh 2.1.2)	4	2019	4	2020
Prototyping & Integrated Testing (P-8/TacMobile) (Increment 3)	1	2018	2	2023
System Engineering Review (Increment 3)	1	2017	1	2017
System Requirements Review (Increment 3)	1	2018	1	2018
System Functional Review (Increment 3)	2	2018	2	2018
Request for Proposal release (Increment 3)	3	2018	3	2018
Preliminary Design Review (Increment 3)	1	2019	1	2019
Critical Design Review (Increment 3)	3	2019	3	2019
Development (Increment 3)	1	2018	2	2023
Developmental Test (Increment 3)	3	2020	3	2021
Operational Assessment (Increment 3)	4	2021	1	2022
Full Rate Production (Increment 3)	2	2023	2	2023
Milestone C (Increment 3)	1	2021	1	2021
Low Rate Initial Production (Increment 3)	1	2020	1	2020
Low Rate Initial Production (Increment 3) 1	1	2021	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 0486 / *Tactical Support Center*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Low Rate Initial Production (Increment 3) 2	2	2022	2	2022
Developmental Test (Increment 3 Tech Eval)	3	2022	3	2022
Operational Test (Increment 3)	4	2022	1	2023
Increment 3 EDM Delivery	1	2020	3	2021
Increment 3 LRIP Delivery	4	2021	4	2023
Combined Operational Tests/Follow On Tests	1	2018	4	2023
Increment 3 IOC	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3032 / *NTCSS (Naval Tactical Command Spt Sys)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3032: *NTCSS (Naval Tactical Command Spt Sys)*	84.713	13.192	4.044	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	101.949
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Naval Tactical Command Support System (NTCSS) is a multi-function program designed to provide standard tactical support information systems to various afloat and associated shore-based fleet activities. The mission is to provide the Navy and Marine Corps with an integrated, scalable system that supports the management of logistical information, personnel, material, and funds required to maintain and operate ships, submarines, and aircraft.

Funding provides for the design, development, and testing of NTCSS Open Architecture (OA) development efforts to include: Global Individual Component Repair List (G-ICRL); Beyond Capability of Maintenance Interdiction (BCM-I); Operational Supply (O-Supply), which includes Table of Allowance & Personal Gear Issue (TOA/PGI) and Total Material Visibility & Requisition Management (TMV/RM).

Funding also supports the transition of the current client-server architecture to a service-oriented architecture (SOA) and web-based services (NTCSS OA). This will align with the initiative to bring Navy systems into a common computing environment afloat, interface with Navy Enterprise Resource Planning (ERP) ashore, and provide a more flexible system platform with greater responsiveness to security, information assurance, functional, and system requirements and with greater speed to capability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NTCSS (Naval Tactical Command Spt Sys)	13.192	4.044	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Maintenance and Supply Management Capability					
FY 2018 Plans: Conduct DT and Operational Testing (OT) for O-Supply to include TOA/PGI.					
FY 2019 Base Plans: Acquisition activities continue under project 3620.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3032 / *NTCSS (Naval Tactical Command Spt Sys)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding in Project 3032 ceases in FY2019 as NTCSS transitioned development of tactical support information systems to the Naval Operational Business Logistics Enterprise (NOBLE).					
Accomplishments/Planned Programs Subtotals	13.192	4.044	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2611: *Naval Tactical Command Support System*	12.336	10.741	10.991	-	10.991	14.571	14.779	16.317	17.896	Continuing	Continuing

Remarks

D. Acquisition Strategy

NTCSS Open Architecture (OA), Global Individual Component Repair List (G-ICRL) and Beyond Capability of Maintenance Interdiction (BCM-I), and O-Supply serve as the initial steps toward achieving the NTCSS OA "End-State" by introducing web-enabled technology, promoting data sharing with operational fleet forces, and utilization of Navy Data Centers to expose data and move workload ashore. This strategy provides the foundation for NTCSS to migrate to a full service-oriented architecture-based enterprise system.

E. Performance Metrics

NTCSS Open Architecture (OA), G-ICRL and BCM-I, eliminate documentation inefficiencies at the Fleet Readiness Centers (FRCs). O-Supply (Table of Allowance & Personal Gear Issue (TOA/PGI) and Total Material Visibility & Requisition Management (TMV/RM) provide centralized and standardized management of PGI and TOA material through the utilization of Navy Data Centers. O-Supply prevents millions of dollars in operational forces obligation losses through improved requisition management. SOA lowers system maintenance costs when compared to maintaining the current, client-server architecture.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3032 / *NTCSS (Naval Tactical Command Spt Sys)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	SSC : North Charleston, SC	0.668	0.000		0.000		0.000		-		0.000	0.000	0.668	0.668
Systems Engineering	C/CPFF	SeaPort : San Diego, CA	3.318	0.430	Nov 2016	0.200	Nov 2017	0.000		-		0.000	0.000	3.948	Continuing
Systems Engineering	WR	SSC : San Diego, CA	0.892	0.000		0.000		0.000		-		0.000	0.000	0.892	-
Licenses	Various	SSC : San Diego, CA	0.700	0.000		0.100	Nov 2017	0.000		-		0.000	0.000	0.800	0.700
Software Development	C/CPFF	SSC : SSC: Norfolk, VA	64.800	4.100	Feb 2017	1.040	Nov 2017	0.000		-		0.000	0.000	69.940	Continuing
Software Development	C/CPFF	Various : San Diego, CA	0.000	7.812	Feb 2017	0.000		0.000		-		0.000	0.000	7.812	Continuing
Software Development	C/CPFF	DTIC : Fort Belvoir, VA	1.592	0.000		0.000		0.000		-		0.000	0.000	1.592	-
Software Development	C/CPFF	GTRI : Atlanta, GA	2.083	0.000		0.000		0.000		-		0.000	0.000	2.083	-
Analysis of Alternatives	Various	SSC : San Diego, CA	2.055	0.000		0.830	Oct 2017	0.000		-		0.000	0.000	2.885	-
Detailed Business Process Re-engineering	Various	NAVAIR : Pax River, CA	0.862	0.000		0.924	Oct 2017	0.000		-		0.000	0.000	1.786	-
Integrated Logistics Support	C/CPFF	SeaPort : San Diego, CA	1.355	0.000		0.400	Nov 2017	0.000		-		0.000	0.000	1.755	Continuing
Configuration Management	WR	SSC : San Diego, CA	0.460	0.000		0.050	Nov 2017	0.000		-		0.000	0.000	0.510	0.460
Technical Data	WR	SSC : San Diego, CA	0.200	0.000		0.050	Nov 2017	0.000		-		0.000	0.000	0.250	0.200
		Subtotal	78.985	12.342		3.594		0.000		-		0.000	0.000	94.921	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWC : Patuxent River, MD	1.254	0.120	Nov 2016	0.000		0.000		-		0.000	0.000	1.374	Continuing
Developmental Test & Evaluation	WR	SPAWAR FRD : San Diego, CA	0.000	0.420	Nov 2016	0.000		0.000		-		0.000	0.000	0.420	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3032 / *NTCSS (Naval Tactical Command Spt Sys)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation Cyber	WR	SSC : San Diego, CA	1.316	0.110	Nov 2016	0.200	Nov 2017	0.000		-		0.000	0.000	1.626	Continuing
Developmental Test & Evaluation	WR	NAVSUP : Mechanicsburg, PA	0.000	0.000		0.050	Nov 2017	0.000		-		0.000	0.000	0.050	-
		Subtotal	2.570	0.650		0.250		0.000		-		0.000	0.000	3.470	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPFF	SeaPort : San Diego, CA	0.896	0.000		0.000		0.000		-		0.000	0.000	0.896	0.896
Government Engineering Support	WR	SSC : San Diego, CA	0.279	0.000		0.000		0.000		-		0.000	0.000	0.279	0.279
Program Management Support	C/CPFF	SeaPort : San Diego, CA	1.983	0.200	Nov 2016	0.200	Nov 2017	0.000		-		0.000	0.000	2.383	Continuing
		Subtotal	3.158	0.200		0.200		0.000		-		0.000	0.000	3.558	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	84.713	13.192		4.044		0.000		-		0.000	0.000	101.949	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy			**Date:** February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3032 / *NTCSS (Naval Tactical Command Spt Sys)*	

Fiscal Year	2017				2018				2019				2020				2021				2022				2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones NTCSS Open Architecture (OA)			Rel 1/2 FD △				Rel 3 FD △																					
Engineering Milestones NTCSS OA Release 1 BCM-Interdiction																												
NTCSS OA Release 2 Global ICRL																												
NTCSS OA Release 3 Operational Supply (TOA/PGI)					TRR/ RRR △																							
NTCSS Web-Enabled (RSUP/OIMA/OOMA)				RSUP RRR △																								
Test & Evaluation Milestones NTCSS OA		Rel 1/2 DT △				Rel 3 DT/OT △																						
Software Deliveries NTCSS OA			Rel 1/2 △				Rel 3 △																					
NTCSS Web-Enabled					RSUP △																							

Release Readiness Review;
DT Developmental Test; OT Operational Test

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3032 / *NTCSS (Naval Tactical Command Spt Sys)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3032				
NTCSS OA Build 1 - Development Test (DT)	2	2017	2	2017
NTCSS OA Build 1 - Software Delivery	3	2017	3	2017
NTCSS OA Build 2 - Development Test (DT)	2	2017	2	2017
NTCSS OA Build 2 - Software Delivery	3	2017	3	2017
NTCSS OA Build 3 - Test Readiness Review (TRR)	1	2018	1	2018
NTCSS OA Build 3 - Release Readiness Review (RRR)	1	2018	1	2018
NTCSS OA Build 3 - Development Test (DT) / Operational Test (OT)	2	2018	2	2018
NTCSS OA Build 3 - Software Delivery	3	2018	3	2018
NTCSS Web-Enabled RSUP - Release Readiness Review (RRR)	4	2017	4	2017
NTCSS Web-Enabled RSUP - Software Delivery	1	2018	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3260: *Naval Operations Business Logistics Enterprise (NOBLE)*	0.000	0.000	19.102	37.792	-	37.792	40.653	31.817	14.126	6.940	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and improves the Navy's tactical support information systems. It includes Naval Operational Supply System (NOSS), Naval Aviation Maintenance System (NAMS), Naval Operational Maintenance Enterprise (NOME), and Naval Administration and Personnel System (NAPS).

NOSS will provide enterprise-wide automation of supply, inventory, and financial functions to the Naval supply system. NOSS incorporates commercial best practices (e.g., Amazon, Wal-Mart, UPS, FedEx, etc.); NOSS will aggregate and analyze logistics data using business intelligence technologies, provide for total asset visibility, optimize business processes at the tactical echelon (field-level) and enterprise support activities, accelerate the ordering/re-ordering process, and permit monitoring of shipments. NOSS will maintain compliance with statutory, regulatory, and policy mandates of Financial Improvement Audit Requirements (FIAR). NOSS will aggregate and analyze operational data in a Business Intelligence (BI) framework to enable historical and predictive common operating pictures for logistics and readiness performance and requirements. FY2019 funding provides for the continuation and completion of software development efforts, the delivery of Software Build 1 (BLD 1) and commencement of Developmental Test and Evaluation (DT&E) efforts for BLD 1.

NAMS will provide an enterprise-wide aviation maintenance support capability that services all levels of aviation maintenance (organizational, intermediate, and depot) for over 2,100 Navy and Marine Corps aircraft. NAMS will identify and assign aviation artisans, and track all levels of aviation maintenance to completion. Aircraft availability and mission-capable rates will increase with the elimination of current inefficiencies; there will be a reduction in total ownership costs. FY2019 funding provides for the completion of software conversion/modernization efforts for Naval Aviation Logistics Command Management Information System (NALCOMIS) applications, conduction of Milestone B/C review, award of the NAMS BLD 1 contract and commencement of software development efforts for BLD 1.

NOME will provide standardized operational business processes for afloat maritime maintenance activities to all naval ships. NOME will provide end-to-end component tracking, reduce administration time by identifying and assigning artisans to repair shipboard equipment, support moving major repair work ashore, and enable exploitation of embedded sensors in weapon systems that will trigger repair action notification. FY2019 funding provides for the conduction of Milestone B/C review, award of the NOME BLD 1 contract and commencement of software development efforts for BLD 1.

NAPS will provide Navy-wide personnel and administration data sharing across shipboard and shore-based information systems. This will eliminate redundant personnel data entry, reduce total ownership costs, and standardize the way personnel and administration data are shared across the Navy. NAPS provides for the efficient use of maintenance personnel with better job/task and personnel skill matching.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Naval Operational Supply System (NOSS)	0.000	14.202	24.113	0.000	24.113
Articles:	-	-	-	-	-
FY 2018 Plans: Develop acquisition documentation in support of a Naval Operational Supply System (NOSS) Milestone B/C decision leading to a Build Decision 1 (BD 1). Perform systems engineering analysis, system design efforts, and software development for NOSS Software Build 1 (BLD 1). ***FY 2019 Base Plans:*** Continue systems engineering analysis, system design efforts, and software development for BLD 1. Commence agile software development to include configuration and modeling and associated System Engineering Technical Reviews (SETR) to satisfy NOSS requirements identified for BLD 1. Commence Functional Manager certification and Developmental Test and Evaluation (DT&E) efforts for BLD 1. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in funding for NOSS due to the transition from conducting an AoA and preparing documentation in FY18 to software development in FY19 to include, integration, data migration, hosting, and Commercial Off The Shelf (COTS) license costs.					
Title: Naval Aviation Maintenance System (NAMS)	0.000	2.400	9.900	0.000	9.900
Articles:	-	-	-	-	-
FY 2018 Plans: Continue software conversion/modernization efforts for Optimized Intermediate Maintenance Activity (OIMA) and Optimized Organizational Maintenance Activity (OOMA) Naval Aviation Logistics Command Management Information System (NALCOMIS) applications (previously funded under Naval Tactical Command Support System (NTCSS) 3032). Prepare/develop acquisition documentation in support of a NAMS Milestone B/C decision leading to a NAMS Build Decision 1 (BD1). ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete software conversion/modernization efforts for NALCOMIS applications. Conduct NAMS Milestone B/C review. Award NAMS Software Build 1 (BLD 1) contract. Commence systems engineering analysis, system design efforts, and software development for BLD 1. Commence agile software development to include configuration and modeling and associated System Engineering Technical Reviews (SETR) to satisfy NAMS requirements identified for BLD 1. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in funding for NAMS due to the transition from conducting an AoA and preparing documentation in FY18 to software development in FY19 to include, integration, data migration, hosting, and Commercial Off The Shelf (COTS) license costs.					
Title: Naval Operational Maintenance Enterprise (NOME) ***Articles:*** ***FY 2018 Plans:*** Conduct Analysis of Alternatives (AoA) for Naval Operational Maintenance Enterprise (NOME). Prepare/develop acquisition documentation in support of NOME Milestone B/C decision leading to a Build Decision 1 (BD 1). ***FY 2019 Base Plans:*** Continue to prepare/develop acquisition documentation in support of a Request For Proposal (RFP) and Milestone B/C decision leading to a BD 1. Conduct Milestone B/C review. Award NOME Software Build 1 (BLD 1) contract. Commence systems engineering analysis, system design efforts, and software development for BLD 1. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in funding for NOME due to the transition from conducting an AoA and preparing documentation in FY18 to software development in FY19 to include, integration, data migration, hosting, and Commercial Off The Shelf (COTS) license costs.	0.000 -	1.500 -	3.779 -	0.000 -	3.779 -
Title: Naval Administration and Personnel System (NAPS) ***Articles:***	0.000 -	1.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Conduct Analysis of Alternatives (AoA) for NAPS. Prepare/develop acquisition documentation in support of a NAPS Milestone B/C decision leading to a Build Decision 1 (BD1). ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	0.000	19.102	37.792	0.000	37.792

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

NOBLE will employ an evolutionary acquisition strategy. Software development will be comprised of multiple builds, each with increasing net-centric services capability. NOBLE is planned as a software-only program, dependent on the Navy Common Computing Environment (CCE). Hardware infrastructure will be provided by CANES, Integrated Shipboard Network System (ISNS), Navy Marine Corps Intranet (NMCI), Next Generation Enterprise Network (NGEN), OneNET (the OCONUS (outside of continental United States) network), and the Department of Navy commercial cloud computing environments. NOBLE's primary contracting method for software development will be competitive award.

E. Performance Metrics

Successfully achieve Milestone B/C decisions for NOSS, NAMS, NOME, and NAPS.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NOME Software Development	TBD	TBD : TBD	0.000	0.000		0.000		2.500	Aug 2019	-		2.500	0.000	2.500	-
NAMS Software Development	TBD	TBD : TBD	0.000	0.000		0.000		7.000	Nov 2018	-		7.000	0.000	7.000	-
NOSS Software Development	TBD	TBD : TBD	0.000	0.000		12.077	Jul 2018	20.363	Oct 2018	-		20.363	Continuing	Continuing	Continuing
NOME System Engineering	WR	SPAWARSYSCEN LANT : Norfolk, VA	0.000	0.000		0.000		0.479	Oct 2018	-		0.479	0.000	0.479	-
NOSS System Engineering	WR	SPAWARSYSCEN LANT : Norfolk, VA	0.000	0.000		0.375	Oct 2017	0.750	Oct 2018	-		0.750	Continuing	Continuing	Continuing
NOSS System Engineering	WR	USFFC : Norfolk, VA	0.000	0.000		0.000		1.000	Dec 2018	-		1.000	0.000	1.000	-
NAMS System Engineering	WR	SPAWARSYSCEN LANT : Norfolk, VA	0.000	0.000		0.750	Oct 2017	0.750	Oct 2018	-		0.750	Continuing	Continuing	Continuing
NOME Analyis of Alternatives (AoA)	TBD	TBD : TBD	0.000	0.000		1.500	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
NAPS Analyis of Alternatives (AoA)	TBD	TBD : TBD	0.000	0.000		1.000	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		15.702		32.842		-		32.842	Continuing	Continuing	N/A

Remarks

FY19 product development increase is due to increased software development and engineering efforts across the NOBLE portfolio.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NOME Developmental Test & Evaluation	WR	NAVSEA : Washington, D.C.	0.000	0.000		0.000		0.200	Oct 2018	-		0.200	0.000	0.200	-
NOME Operational Test & Evaluation	WR	COTF : Norfolk, VA	0.000	0.000		0.000		0.200	Oct 2018	-		0.200	0.000	0.200	-
NAMS Developmental Test & Evaluation	WR	NAVAIR : Patuxent River, MD	0.000	0.000		0.000		0.250	Oct 2018	-		0.250	0.000	0.250	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NAMS Operational Test & Evaluation	WR	COTF : Norfolk, VA	0.000	0.000		0.000		0.250	Oct 2018	-		0.250	0.000	0.250	-
NOSS Developmental Test & Evaluation (Documentation)	WR	NAVSUP : Mechanicsburg, PA	0.000	0.000		0.250	Oct 2017	0.250	Oct 2018	-		0.250	Continuing	Continuing	Continuing
NOSS Operational Test & Evaluation (Documentation)	WR	COTF : Norfolk, VA	0.000	0.000		0.250	Oct 2017	0.250	Oct 2018	-		0.250	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.500		1.400		-		1.400	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NOME System Engineering Support	WR	SPAWARSYSCEN PAC : San Diego, CA	0.000	0.000		0.000		0.200	Oct 2018	-		0.200	0.000	0.200	-
NOSS System Engineering Support	WR	SPAWARSYSCEN PAC : San Diego, CA	0.000	0.000		0.250	Oct 2017	0.750	Oct 2018	-		0.750	Continuing	Continuing	Continuing
NAMS System Engineering Support	WR	SPAWARSYSCEN PAC : San Diego, CA	0.000	0.000		0.250	Oct 2017	0.825	Oct 2018	-		0.825	Continuing	Continuing	Continuing
NOME Program Management Support	C/CPFF	SeaPort : San Diego, CA	0.000	0.000		0.000		0.200	Oct 2018	-		0.200	0.000	0.200	-
NOSS Program Management Support	C/CPFF	SeaPort : San Diego, CA	0.000	0.000		1.000	Nov 2017	0.750	Oct 2018	-		0.750	Continuing	Continuing	Continuing
NAMS Program Management Support	C/CPFF	SeaPort : San Diego, CA	0.000	0.000		1.400	Nov 2017	0.825	Oct 2018	-		0.825	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		2.900		3.550		-		3.550	Continuing	Continuing	N/A

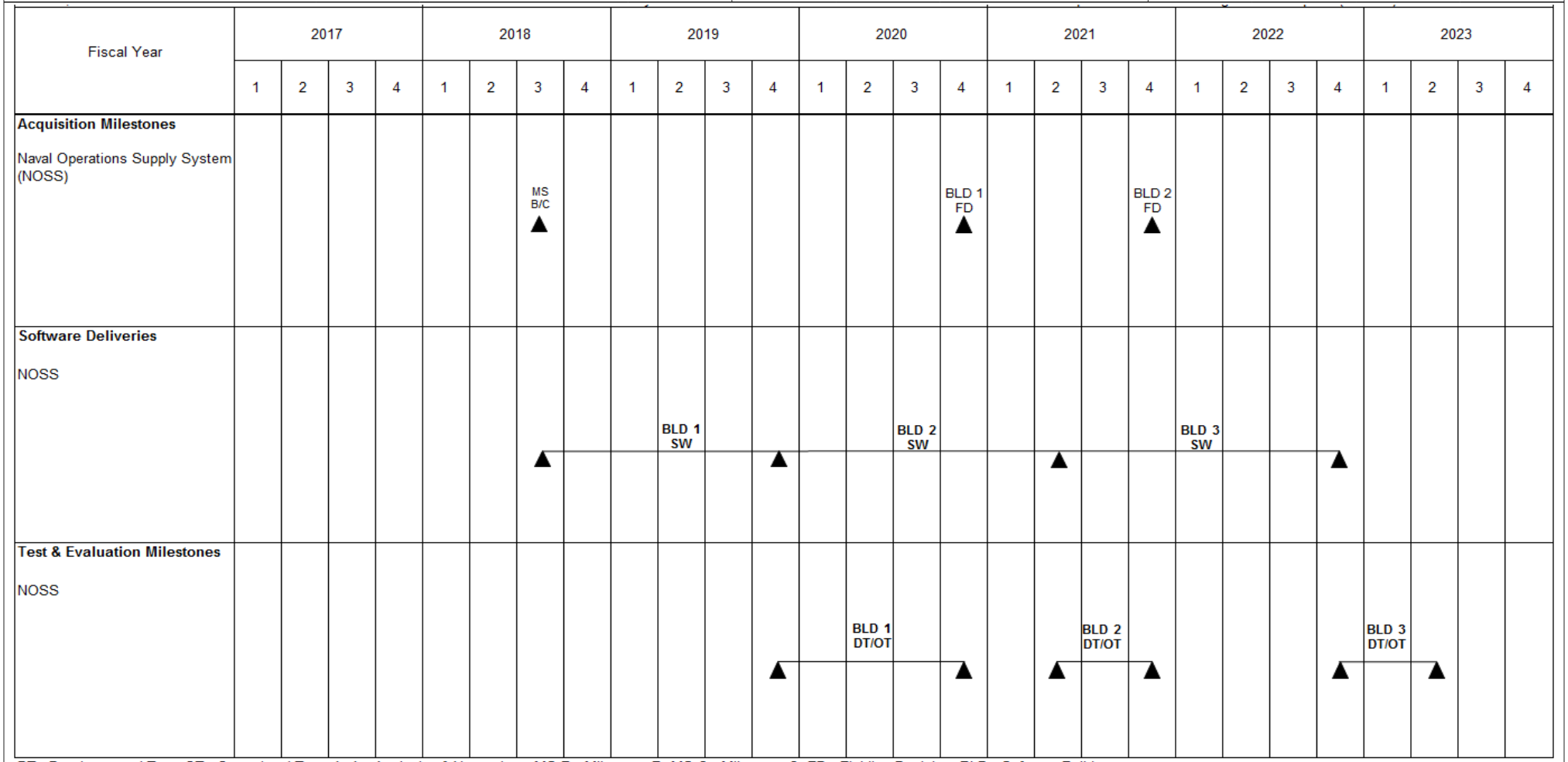
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		19.102		37.792		-		37.792	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*	

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract

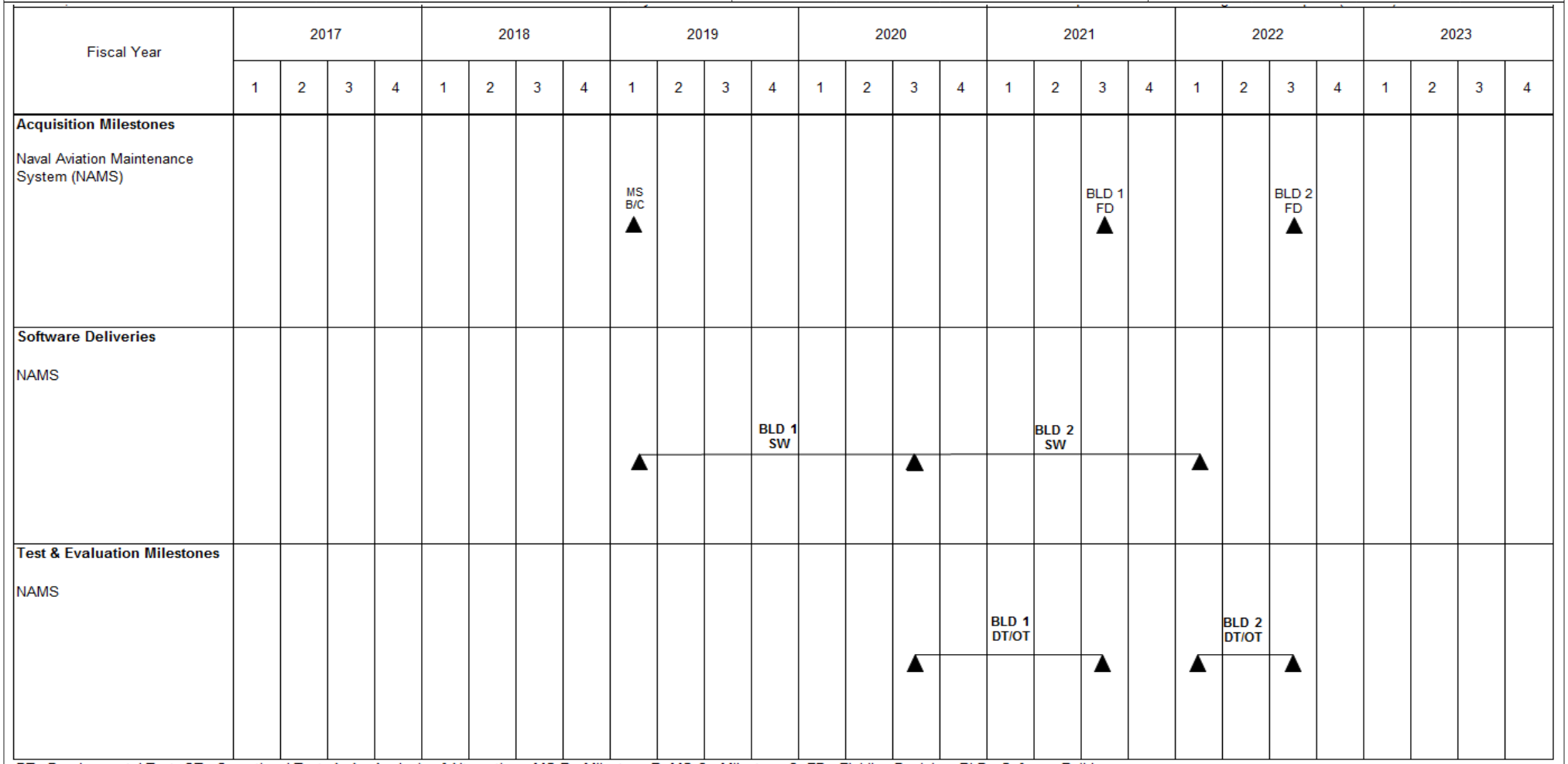
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*



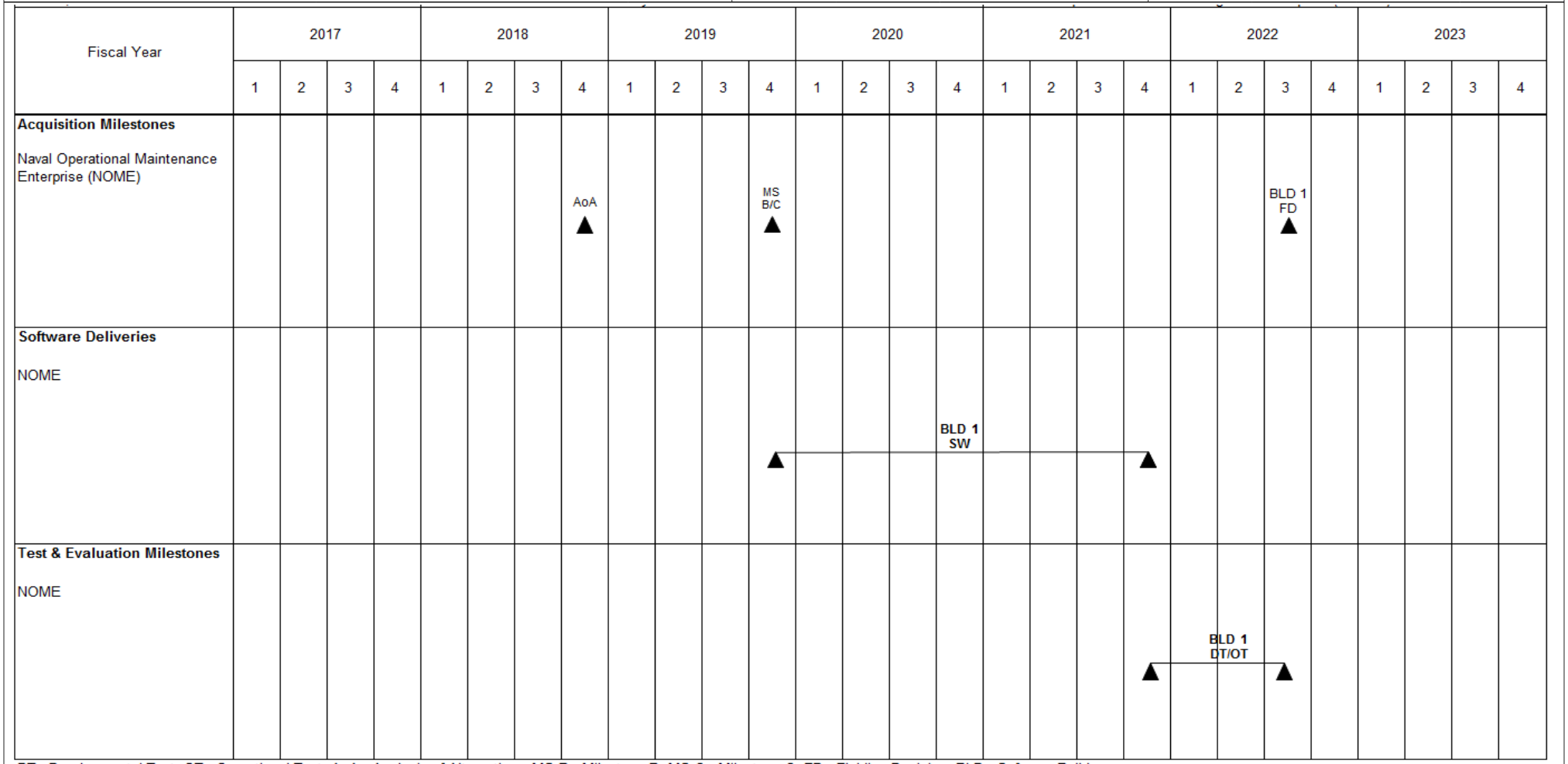
DT - Developmental Test; OT - Operational Test; AoA - Analysis of Alternatives; MS B - Milestone B; MS C - Milestone C; FD - Fielding Decision; BLD - Software Build

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*



DT - Developmental Test; OT - Operational Test; AoA - Analysis of Alternatives; MS B - Milestone B; MS C - Milestone C; FD - Fielding Decision; BLD - Software Build

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*



DT - Developmental Test; OT - Operational Test; AoA - Analysis of Alternatives; MS B - Milestone B; MS C - Milestone C; FD - Fielding Decision; BLD - Software Build

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*

Fiscal Year	2017				2018				2019				2020				2021				2022				2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Milestones Naval Administration and Personnel System (NAPS)							AoA ▲				MS B/C ▲												BLD 1 FD ▲						
Software Deliveries NAPS																			BLD 1 SW ▲									
Test & Evaluation Milestones NAPS																							BLD 1 DT/OT ▲					

DT - Developmental Test; OT - Operational Test; AoA - Analysis of Alternatives; MS B - Milestone B; MS C - Milestone C; FD - Fielding Decision; BLD - Software Build

Note: Schedule is notional; funding and activity will be on hold pending the identification of functional manager to validate program requirements.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3260				
Naval Administration and Personnel System (NAPS) Analysis of Alternatives (AoA)	3	2018	3	2018
Naval Operational Supply System (NOSS) Milestone B/C	3	2018	3	2018
Naval Operational Maintenance Enterprise (NOME) Analysis of Alternatives (AoA)	4	2018	4	2018
Naval Aviation Maintenance System (NAMS) Milestone B/C	1	2019	1	2019
NAPS Milestone B/C	3	2019	3	2019
NOME Milestone B/C	4	2019	4	2019
NOSS Build 1 Release	3	2018	4	2019
NAMS Build 1 Release	1	2019	3	2020
NOSS Build 1 Developmental/Operational Test (DT/OT)	4	2019	4	2020
NOSS Build 1 Fielding Decision (FD)	4	2020	4	2020
NOSS Build 2 Release	4	2019	2	2021
NAMS Build 1 Developmental/Operational Test (DT/OT)	3	2020	3	2021
NAPS Build 1 Release	3	2021	3	2021
NAMS Build 1 Fielding Decision (FD)	3	2021	3	2021
NOME Build 1 Release	4	2019	4	2021
NOSS Build 2 FD	4	2021	4	2021
NOSS Build 2 DT/OT	2	2021	4	2021
NAMS Build 2 Release	3	2020	1	2022
NAPS Build 1 Developmental/Operational Test (DT/OT)	3	2022	3	2022
NOME Build 1 Developmental/Operational Test (DT/OT)	4	2021	3	2022
NAMS Build 2 DT/OT	1	2022	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3260 / *Naval Operations Business Logistics Enterprise (NOBLE)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NOME Build 1 Fielding Decision (FD)	3	2022	3	2022
NAPS Build 1 Fielding Decision (FD)	3	2022	3	2022
NAMS Build 2 FD	3	2022	3	2022
NOSS Build 3 Release	3	2021	4	2022
NOSS Build 3 DT/OT	4	2022	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3323 / *Maritime Tactical Command & Control (MTC2)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3323: *Maritime Tactical Command & Control (MTC2)*	45.833	14.023	17.487	12.038	-	12.038	8.888	9.099	9.335	9.588	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Maritime Tactical Command and Control (MTC2) is the next generation Command and Control (C2) software program that will deliver Battle Management Aids (BMA) and Maritime Planning Tools (MPT) to dynamically plan, direct, monitor, and assess maritime operations in support of Joint, Multi-Service, Coalition Forces planning. MTC2 will leverage a System of Services (SoServ) to deliver capabilities improving decision speed and dynamic synchronization of forces. BMAs / MPTs are small, capability-focused deliveries that can be rapidly developed, tested, and fielded. MTC2 will leverage Science and Technology (S&T) investments and will engage with the Navy Requirements Governance Board to define and prioritize the BMAs and MPTs that MTC2 will deliver and align to the Program Executive Office (PEO) Command, Control, Communications, and Intelligence (C4I) enterprise architecture (Consolidated Afloat Network Enterprise Service (CANES), Agile Core Services (ACS)) for fielding to all echelons of command (Afloat and Ashore) within the Navy. The program's objective is to provide a suite of maritime applications (BMAs / MPTs) that enable planning, execution, monitoring, and assessment in support of operational and tactical level of war requirements. MTC2 will field BMAs / MPTs designed to provide automated and structured support for tactical and operational planning, decision-making, and execution. As a software-only program that leverages enterprise infrastructure, MTC2 will provide new and improved capabilities to include an Operational Planning Tool (OPT), an improved browser enabled map visualization that will enable the warfighter to associate tracks to relevant data, past and predicted movements, ingest Meteorology and Oceanography information, and operational overlays. MTC2's updated architecture will enable future composable C2 capabilities to respond to a more rapid pace in changes in threats and technology. MTC2 is the Navy's solution to Global Force Management - Data Initiative (GFM-DI) which is Department of Defense (DoD) -wide enterprise solution that enables visibility/accessibility/ sharing of data applicable to the entire DoD force structure. MTC2 will incorporate distributed data transfer capability for enhanced operational data exchange between command and control systems, combat systems, logistics, and intelligence systems for timely threat identification, location, and status alongside blue force data.

FY 2019 funding will provide prototype development, integration, and testing for additional BMAs / MPTs and the Navy's allocation requirement to support DoD Joint GFM effort on the MTC2 Secure Internet Protocol Router Network (SIPRNET) Development Environment. OPT will provide capability for a Carrier Strike Group (CSG and be extended to include Maritime Operations Center (MOC) scheduling, to create cohesive operations plans/schedules. The Navy Wave BMA will provide collaborative service that allows users to see other distributed planners' edits in real-time, and works in disconnected, intermittent, and limited (DIL) environments. The MTC2 SIPRNET Development Environment will be available to the fleet to enable rapid feedback on improvements to BMAs / MPTs. MTC2 project prototype baseline comprised of OPT, Navy Wave BMAs / MPTs will be demonstrated at Trident Warrior (TW) 19. In FY 2019, MTC2 will continue transitioning prototype capabilities to a program of record and initiating program of record development, integration and test activities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Maritime Tactical Command and Control (MTC2)	12.590	17.487	12.038	0.000	12.038
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3323 / *Maritime Tactical Command & Control (MTC2)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Provide prototype development, integration, and testing for Battle Management Aids (BMA) / Maritime Planning Tools (MPT): Operational Planning Tool (OPT), Navy Wave, and Distributed Data Transfer Service (DDTS) on the MTC2 Secure Internet Protocol Router Network (SIPRNET) Development Environment. Enable Fleet feedback for BMA / MPT improvement leveraging the MTC2 SIPRNET Development Environment. Field initial MTC2 project prototype baseline including OPT and Navy Wave BMAs / MPTs. Demonstrate MTC2 project prototype baseline including OPT and Navy Wave BMAs / MPTs at TW 18. Continue development to align to Program Executive Office (PEO) Command, Control, Communications, and Intelligence (C4I) enterprise architecture (Consolidated Afloat Networks and Enterprise Services (CANES) / Agile Core Services (ACS)). Conduct pre-Milestone B/Build Decision program and acquisition activities including all statutory and regulatory documentation to meet Milestone B/Build Decision requirements. Hold a Milestone B/Build Decision and become a program of record. Continue integration and testing of designated Global Force Management - Data Initiative (GFM-DI) capabilities for translation into the MTC2 prototype software baseline and begin integration and testing for fielding. Initiate transitioning prototype capabilities to a program of record and initiate program of record development, integration and test activities.					
FY 2019 Base Plans: MTC2 will deliver Ashore/Afloat prototype of program of record capability to a Carrier Strike Group (CSG) and/or Maritime Operations Center (MOC); continue development to align to PEO C4I enterprise architecture (CANES / ACS). MTC2 will continue development, integration, and testing for additional BMAs / MPTs to include the Maintain Naval Force Status capability. MTC2 will develop, test, and integrate interfaces to summarize unit network and communication status, unit readiness, and unit equipment status. Data that is integrated into MTC2 will be displayed simultaneously in a capabilities and characteristics status display known as the "Baseball Card", which will require Human Factors Engineering (HFE) in addition to development, integration, and test. MTC2 will incorporate HFE updates for BMA / MPT improvements leveraging the MTC2 SIPRNET Development Environment. MTC2 will demonstrate capabilities at TW 19. MTC2 will continue integration and testing of Global Force Management - Data Initiative (GFM-DI) capabilities for translation into the MTC2 prototype software baseline for fielding.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3323 / *Maritime Tactical Command & Control (MTC2)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY2018 to FY2019 funding for MTC2 decreases due to direction to align to the new program scope per the Strategic Shift Memo from the Office of the Chief of Naval Operations (OPNAV) dated 28 NOV 2016. In order to meet OPNAV's redirection, the program was required to re-baseline in order to focus on delivery of Battle Management Aids (BMA) / Maritime Planning Tools (MPT).					
Title: Global Force Management - Data Intiative (GFM-DI) ***Articles:*** ***FY 2018 Plans:*** Beginning in FY18, GFM-DI plans and accomplishments will be moving under the MTC2 Project and Program of Record. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A	1.433 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	14.023	17.487	12.038	0.000	12.038

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

MTC2 acquisition strategy will align to DoDI 5000.02 Model 3 Incrementally Deployed Software Intensive Program. MTC2 will execute a rapid software development acquisition strategy that is responsive to the fleet needs. Instead of a single Milestone C, software development will be comprised of multiple software releases defined by Capability Drops (CDs) of increasing levels of net-centric services capability, with separate Annual Build Decisions. MTC2 will remain in the Risk Reduction prototype phase until Milestone B scheduled in FY 2018. MTC2 will be software only requiring the information technology infrastructure network and hardware provided by other network centric programs. MTC2's primary contracting method for software development will utilize Space and Naval Warfare (SPAWAR) Systems Command contracts. SPAWAR Systems Center - Pacific (SSC-PAC), San Diego, CA will be the designated Software Support Activity (SSA).

E. Performance Metrics

MTC2 performance metrics will be defined and approved during Milestone B projected for FY 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3323 / *Maritime Tactical Command & Control (MTC2)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	SSC : San Diego, CA	6.692	3.125	Dec 2016	4.095	Dec 2017	2.909	Dec 2018	-		2.909	Continuing	Continuing	Continuing
Training Development	WR	SSC : San Diego, CA	1.795	0.145	Dec 2016	0.177	Dec 2017	0.078	Dec 2018	-		0.078	Continuing	Continuing	Continuing
Integration, Assembly & Test	WR	SSC : San Diego, CA	21.075	5.574	Dec 2016	0.000		3.096	Dec 2018	-		3.096	0.000	29.745	23.363
Studies & Design	MIPR	Various : Various	1.764	0.000		0.000		0.000		-		0.000	0.000	1.764	1.764
Systems Engineering	C/CPFF	Various : Various	9.543	2.744	Dec 2016	3.440	Dec 2017	1.855	Dec 2018	-		1.855	Continuing	Continuing	Continuing
Software Development	WR	SSC : San Diego, CA	0.000	1.384	Dec 2016	8.543	Dec 2017	3.139	Dec 2018	-		3.139	Continuing	Continuing	Continuing
		Subtotal	40.869	12.972		16.255		11.077		-		11.077	Continuing	Continuing	N/A

Remarks

The increase in Integration, Assembly, and Test costs in FY19 are due to integration and testing requirements leading up to Test Event 1 and the initial delivery of the Ashore/ Afloat prototype.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	SSC : Norfolk, VA/ San Diego, CA	0.047	0.088	Dec 2016	0.107	Dec 2017	0.078	Dec 2018	-		0.078	Continuing	Continuing	Continuing
Integrated Logistics Support	C/CPFF	SeaPort : San Diego, CA	0.000	0.061	Dec 2016	0.000		0.148	Dec 2018	-		0.148	Continuing	Continuing	Continuing
		Subtotal	0.047	0.149		0.107		0.226		-		0.226	Continuing	Continuing	N/A

Remarks

The FY19 increase in Integrated Logistics Support are a result of the initial development of training curriculum and vital acquisition documents to include the Users Logistics Support Summary (ULSS).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3323 / *Maritime Tactical Command & Control (MTC2)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	SSC : San Diego, CA	0.974	0.000		0.000		0.000		-		0.000	0.000	0.974	0.974
Contractor Engineering Support	C/CPFF	SeaPort : San Diego, CA	0.476	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	SeaPort : San Diego, CA	3.429	0.902	Dec 2016	0.890	Dec 2017	0.735	Dec 2018	-		0.735	Continuing	Continuing	Continuing
Program Management Support	WR	SSC : San Diego, CA	0.000	0.000	Dec 2016	0.235	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Management Services	Various	Various : Various	0.038	0.000		0.000		0.000		-		0.000	0.000	0.038	-
		Subtotal	4.917	0.902		1.125		0.735		-		0.735	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	45.833	14.023		17.487		12.038		-		12.038	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3323 / *Maritime Tactical Command & Control (MTC2)*

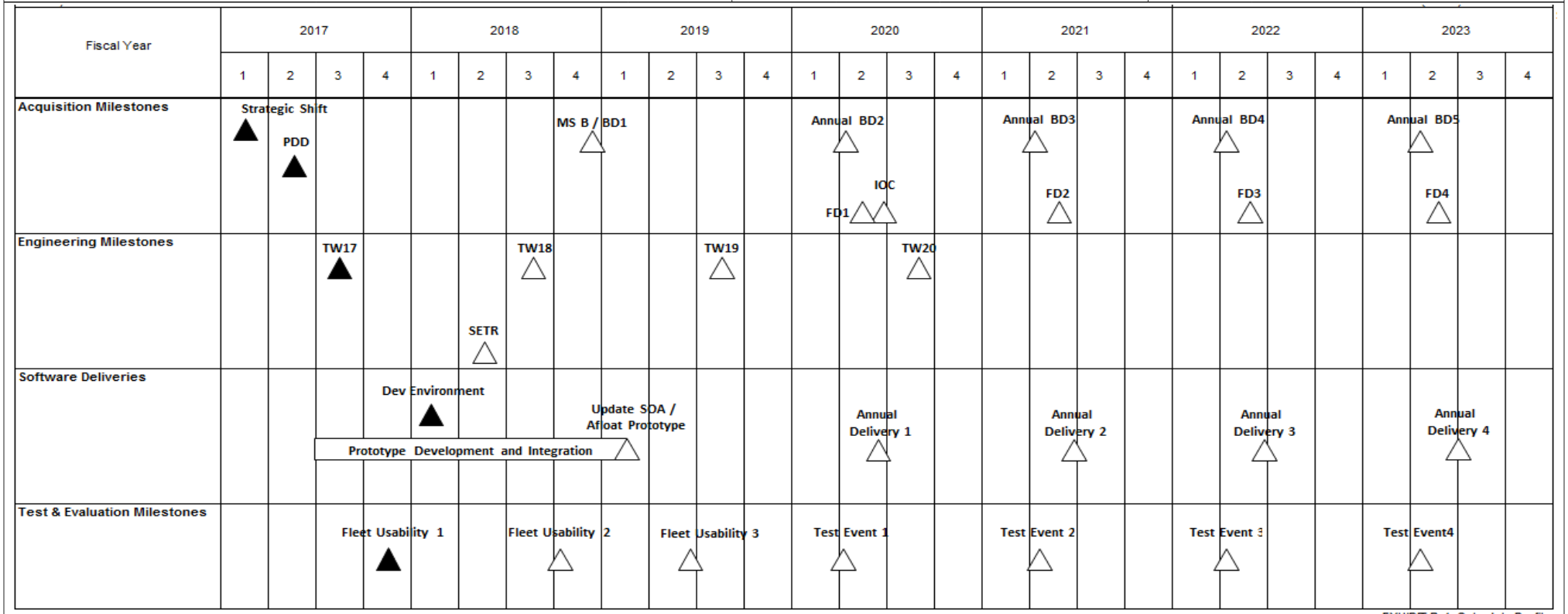


EXHIBIT R-4, Schedule Profile

Legend:

BD - Build Decision
Dev - Development
FD - Field Decision
IOC - Initial Operational Capability
MS - Milestone
PDD - Project Definition Document
SETR - Systems Engineering Technical Review
SOA - Service Oriented Architecture
TW - Trident Warrior

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3323 / *Maritime Tactical Command & Control (MTC2)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3323				
Program Strategic Shift Direction	1	2017	1	2017
Project Description Document (PDD)	2	2017	2	2017
Trident Warrior Fiscal Year 2017 (TW)	3	2017	3	2017
Prototype Development and Integration	3	2017	4	2018
Fleet Usability 1	4	2017	4	2017
Development Environment	1	2018	1	2018
System Engineering Technical Review (SETR)	2	2018	2	2018
Trident Warrior Fiscal Year 2018 (TW)	3	2018	3	2018
Fleet Usability 2	4	2018	4	2018
Milestone B / Build Decision (BD) 1	4	2018	4	2018
Update Service Oriented Architecture (SOA) / Afloat Prototype	1	2019	1	2019
Fleet Usability 3	2	2019	2	2019
Trident Warrior Fiscal Year 2019 (TW)	3	2019	3	2019
Test Event 1	2	2020	2	2020
Fielding Decision (FD) 1	2	2020	2	2020
Annual Delivery 1	2	2020	2	2020
Initial Operational Capability (IOC)	2	2020	2	2020
Annual Build Decision (BD) 2	2	2020	2	2020
Trident Warrior Fiscal Year 2020 (TW)	3	2020	3	2020
Test Event 2	2	2021	2	2021
Fielding Decision (FD) 2	2	2021	2	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3323 / *Maritime Tactical Command & Control (MTC2)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Annual Delivery 2	2	2021	2	2021
Annual Build Decision 3	2	2021	2	2021
Test Event 3	2	2022	2	2022
Fielding Decision (FD) 3	2	2022	2	2022
Annual Delivery 3	2	2022	2	2022
Annual Build Decision 4	2	2022	2	2022
Test Event 4	2	2023	2	2023
Fielding Decision (FD) 4	2	2023	2	2023
Annual Delivery 4	2	2023	2	2023
Annual Build Decision (BD) 5	2	2023	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3324 / *Navy Air Operations Command and Control (NAOC2)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3324: *Navy Air Operations Command and Control (NAOC2)*	13.081	0.963	1.048	1.004	-	1.004	0.710	0.518	0.747	0.763	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Navy Air Operations Command and Control (NAOC2): NAOC2 integrates and tests Air Force program of record systems that provide an integrated and scalable planning system for standardized, secure, and automated decision support for Air Force, Joint, and Allied commanders worldwide. These programs provide automated air operations planning, execution management and intelligence capabilities at the Force level to include fleet commanders, numbered fleet commanders, Commander Carrier Strike Groups, Commander Expeditionary Strike Groups, Commander Landing Forces, and Joint Task Force Commanders. NAOC2 includes Theater Battle Management Core System (TBMCS) and Command and Control Air Operations Suite - Command and Control Information Services (C2AOS-C2IS). C2AOS-C2IS is comprised of multiple projects incorporated into three Capability Packages (CPs) and will deploy to a Service Oriented Architecture (SOA) enterprise environment that aligns with the Joint C2 Reference Architecture (JC2RA) such as Consolidated Afloat Networks and Enterprise Services (CANES). C2AOS-C2IS is not natively compatible with Navy Information Technology (IT) infrastructure, such as CANES, and requires a significant level of system integration. Continuation of Navy integration and test efforts will significantly enhance the ability of the Joint Force Air Component Commander and Combined Air Operations Center personnel to plan daily air operations including strike, airlift, offensive/defensive air, missile defense, and refueling missions in support of combat operations. C2AOS-C2IS addresses the requirement of war fighter distributed planning and execution processes along with significantly improving Joint interoperability. TBMCS continues a hardware transition to CANES. Currently, TBMCS is the key system that is used to conduct real world air planning in the Joint and Navy environments. C2AOS-C2IS will replace TBMCS while bringing more flexibility to the war fighter. In FY 2019, the program will continue Navy CANES integration/testing for Air Force developed C2AOS-C2IS CPs and Command and Control Software Baseline (C2SB), and support Navy operational test agency execution during multi-service test events.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Command and Control Air and Space Operations Suite - Command and Control Information Services (C2AOS-C2IS) Integration and Testing	0.963	1.048	1.004	0.000	1.004
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct integration and validation of a combined Capability Package 1 (CP1)/CP2/CP3 capability set and Command and Control Software Baseline (C2SB) in support of a Command and Control Air and Space Operations Suite - Command and Control Information Services (C2AOS-C2IS) Risk Reduction Integration Event (RRIE) and a combined DT event. Conduct a Consolidated Afloat Networks and Enterprise Services (CANES) System Integration Test (SIT) event to ensure a combined CP1/CP2/CP3 capability set and C2SB is operable on CANES. Confirm full functionality on Navy infrastructure to include CANES, ensuring increased					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3324 / *Navy Air Operations Command and Control (NAOC2)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Joint interoperability and enhanced capability including theater level air planning with distributed re-planning and execution processes. Participate in Joint United States Air Force (USAF)/United States Navy (USN) DT events leading up to FY 2019 Multi-Service Operational Test and Evaluation (MOT&E) events. Work with Operational Test agency to leverage DT events to extract relevant operational test threads and limit scope for MOT&E Afloat and Ashore sites. ***FY 2019 Base Plans:*** Conduct application integration, produce installation documentation, and execute testing of C2AOS-C2IS CPs and C2SB within a CANES System Integration Test (SIT) event, to ensure product compatibility with Navy infrastructure and allow execution of Multi-Service Operational Test and Evaluation (MOT&E). Support operational test agency execution of MOT&E. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2018 to FY2019 funding for NAOC2 decreases due to reduced testing efforts in FY2019 resulting from Navy's leveraging of Joint (USAF/USN) testing and integration activities.					
Accomplishments/Planned Programs Subtotals	0.963	1.048	1.004	0.000	1.004

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Theater Battle Management Core System (TBMCS) and Command and Control Air Operations Suite - Command and Control Information Services (C2AOS-C2IS) are designed, developed, and delivered by the Air Force and will be integrated for a Navy Common Computing Environment (CCE) such as Consolidated Afloat Network and Enterprise Services (CANES). As a Joint interest program, this approach satisfies the current validated requirements, supports the accelerated retirement of legacy hardware, and reduces overall risk to the program.

E. Performance Metrics

Theater Battle Management Core System (TBMCS) and Command and Control Air Operations Suite - Command and Control Information Services (C2AOS-C2IS) are designed, developed, and delivered by the Air Force. This leverage reduces integration and testing costs associated with each capability

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3324 / *Navy Air Operations Command and Control (NAOC2)*

module. The solutions will reside on Navy Common Computing Environment (CCE)/Consolidated Afloat Network and Enterprise Services (CANES) architecture. These software-only solutions eliminate hardware procurement, installation, and reduce sustainment costs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3324 / *Navy Air Operations Command and Control (NAOC2)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Training DevelopmentText/ Configuration Management	WR	SSC Pacific : San Diego, CA	3.766	0.000		0.000		0.053	Nov 2018	-		0.053	0.000	3.819	3.819
Integration and Testing	WR	SSC Pacific : San Diego, CA	0.000	0.782	Jan 2017	0.878	Nov 2017	0.858	Nov 2018	-		0.858	Continuing	Continuing	Continuing
NAOC2 Product Development	Various	VARIOUS : VARIOUS	2.512	0.000		0.000		0.000		-		0.000	0.000	2.512	2.512
		Subtotal	6.278	0.782		0.878		0.911		-		0.911	Continuing	Continuing	N/A

Remarks

GFE supports integration efforts, not for fielding.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development/ILS Support	WR	VARIOUS : VARIOUS	0.538	0.000		0.000		0.000		-		0.000	0.000	0.538	0.180
		Subtotal	0.538	0.000		0.000		0.000		-		0.000	0.000	0.538	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	MIPR	COMOPTEVFOR : Norfolk, VA	0.369	0.018	Dec 2016	0.080	Nov 2017	0.044	Nov 2018	-		0.044	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	SSC Pacific : San Diego, CA	2.651	0.000		0.090	Oct 2017	0.000		-		0.000	0.000	2.741	2.741
Integration and Testing	WR	VARIOUS : VARIOUS	2.340	0.000		0.000		0.000		-		0.000	0.000	2.340	2.340
		Subtotal	5.360	0.018		0.170		0.044		-		0.044	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3324 / *Navy Air Operations Command and Control (NAOC2)*

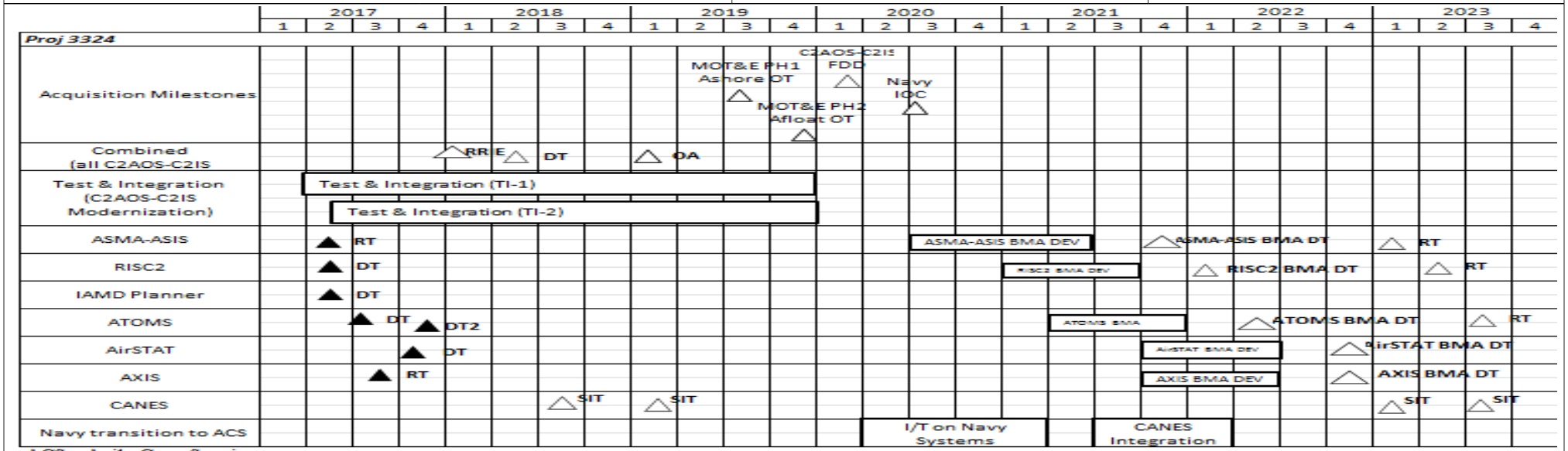
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPFF	Sentek : San Diego, CA	0.651	0.148	Jan 2017	0.000		0.000		-		0.000	0.000	0.799	0.799
Program Management Support	C/CPFF	Booz Allen : San Diego, CA	0.254	0.015	Jul 2017	0.000		0.049	Nov 2018	-		0.049	0.000	0.318	0.318
		Subtotal	0.905	0.163		0.000		0.049		-		0.049	0.000	1.117	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	13.081	0.963		1.048		1.004		-		1.004	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3324 / *Navy Air Operations Command and Control (NAOC2)*



ACS - Agile Core Services
AirSTAT - Air Status *[CP-1 project]*
ASMA-ASIS - Airspace Management Application/Airspace Information service *[CP-2 project]*
ATOMS - Air Tasking Order Management System *[CP-1 project]*
AXIS - Air Execution Information System *[CP-3 project]*
BMA - Battle Management Aid
C2AOS-C2IS - Command and Control Air Operations Suite - Command and Control Information Services
CANES - Consolidated Afloat Network and Enterprise Services
CP - Capability Package
DEV - Development
DT - Developmental Test
FDD - Full Deployment Decision
IOC - Initial Operational Capability
I/T - Integration and Testing
IAMD - Integrated Air and Missile Defense *[CP-2 project]*
MOT&E - Multi-Service Operational Test & Evaluation
OA - Operational Assessment
OT - Operational Test
PH - Phase
RISC2 - Request Information Services for Command and Control *[CP-1 project]*
RRIE - Risk Reduction Integration Event
RT - Regression Test
SIT - System Integration Test
TI - Test and Integration

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3324 / *Navy Air Operations Command and Control (NAOC2)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3324				
C2AOS-C2IS Modernization Test & Integration (TI-1)	1	2017	4	2019
Airspace Management Application/Airspace Information service (ASMA-ASIS) Regression Test (RT)	2	2017	2	2017
Request Information Services for Command and Control (RISC2) Developmental Test (DT)	2	2017	2	2017
Integrated Air and Missile Defense (IAMD) Planner DT	2	2017	2	2017
C2AOS-C2IS Modernization Test & Integration (TI-2)	2	2017	4	2019
Air Tasking Order Management System (ATOMS) DT	3	2017	3	2017
Air Execution Information System (AXIS) RT	3	2017	3	2017
Air Status (AirSTAT) DT	4	2017	4	2017
ATOMS DT2	4	2017	4	2017
Combined Command and Control Air Operations Suite - Command and Control Information Services (C2AOS-C2IS) Risk Reduction Integration Event (RRIE)	1	2018	1	2018
Combined C2AOS-C2IS DT	2	2018	2	2018
Consolidated Afloat Network and Enterprise Services (CANES) System Integration Test (SIT) FY 2018	3	2018	3	2018
CANES SIT FY 2019	1	2019	1	2019
Operational Assessment	1	2019	1	2019
Multi-Service Operational Test & Evaluation (MOT&E) (OT Phase 1)	3	2019	3	2019
MOT&E (OT Phase 2)	4	2019	4	2019
C2AOS-C2IS Full Deployment Decision (FDD)	1	2020	1	2020
Navy Initial Operational Capability (IOC)	3	2020	3	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3324 / *Navy Air Operations Command and Control (NAOC2)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Integration and Testing (I/T) on Navy Systems	2	2020	1	2021
ASMA-ASIS Battle Management Aid (BMA) Development (Dev)	3	2020	2	2021
RISC2 BMA Dev	1	2021	3	2021
ATOMS BMA Dev	2	2021	4	2021
CANES Integration	3	2021	1	2022
ASMA-ASIS BMA DT	4	2021	4	2021
AirSTAT BMA Dev	4	2021	2	2022
AXIS BMA Dev	4	2021	2	2022
RISC2 BMA DT	1	2022	1	2022
ATOMS BMA DT	2	2022	2	2022
AirSTAT BMA DT	4	2022	4	2022
AXIS BMA DT	4	2022	4	2022
ASMA-ASIS RT	1	2023	1	2023
CANES SIT FY 2023 1	1	2023	1	2023
RISC2 RT	2	2023	2	2023
ATOMS RT	3	2023	3	2023
CANES SIT FY2023 2	3	2023	3	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3425 / *Digital Warfare*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3425: *Digital Warfare*	0.000	0.000	5.950	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.950
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Funding decrease due to realignment of FY19 funds to the DW PE (0604027N) beginning in FY19.

A. Mission Description and Budget Item Justification

The DW technical initiatives directly support the Chief of Naval Operations (CNO) vision of inherent interoperability across the Navy enabling faster deployment of capabilities to the warfighter.

DW funding supports development of requirements modeling and data science experimentation environment, mission area model-based engineering (MBE) teams, development of digital technical baselines, development of digital architectures, and the development of workforce training in model-based systems engineering.

Naval Air Systems Command (NAVAIR), Naval Sea Systems Command (NAVSEA), Space and Naval Warfare Command (SPAWAR), associated Program Executive Offices (PEOs), warfare and system centers and University Affiliated Research Centers (UARCs)/Federally Funded Research and Development Centers (FFRDCs) will support the Model Based Systems Engineering (MBSE), Technical Design, and Requirements branches in the new DW under Office of the Chief of Naval Operations (OPNAV) N2N6. In order to develop capability from the top down, the DW will develop requirements for the System of Systems (SoS) to include all of the associated interoperability requirements. Due to the complexity of this work, the DW will evolve the traditional requirements development methodology to a MBSE environment that will include associated model extensions, reports, views, configuration management, help desk support, and documentation. This work will be completed by a series of teams, each focused on a separate threat domain, and made up of system modelers, fleet representatives, Program of Record (PoR) representatives, architecture, and interoperability experts. The products generated by these teams will include data technical baselines for domain areas with individual profiles for each program of record, coordinated requirements recommendations, and potential areas for Science and Technology (S&T) and experimentation to fill gaps. The DW will include emerging digital technologies including human/machine teaming.

Each Systems Command (SYSCOM) will be involved in creating Data Technical Baseline (DTB) profiles specific for each PoR. DTBs will consist of interfaces, protocols, content, information quality, architectural aspects, and knowledge base frameworks. SYSCOMs will exercise technical authority to assess PoR compliance to DTBs and Key Performance Parameters (KPPs) in support of gate reviews and system engineering technical reviews.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Digital Warfare (DW) Model Based Systems Engineering (MBSE)	0.000	5.950	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3425 / *Digital Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Provide Subject Matter Expert (SME) support for the domain functional decomposition based on prioritized mission areas to include Anti-Submarine Warfare and Surface Warfare. -Perform Model Based Systems Engineering (MBSE) assessments on Programs of Record (PoRs) and develop models of the relevant Data Technical Baselines (DTBs). -Establish and implement required extensions to model requirements trace and reports that will be used in the Joint Capabilities Integration and Development System (JCIDS) process. -Validate current standards across the Systems Commands (SYSCOMs) to form the overarching Navy DTB in order to facilitate tailoring of each standard for the PoR DTB. -Verify and validate different SYSCOM architectures and guidance to produce a Navy-wide high level architectural framework. -Develop functional baseline architecture of Navy capabilities that maps back to mission threads. -Configure the distributed MBSE and data science environment for remote accessibility over a given network enclave, including but not limited to Non-Secure Internet Protocol Router (NIPR), Secure Internet Protocol Router (SIPR), and JointWorldwide Intelligence Communications System (JWICS). -Integrate cyber requirements across all Digital Warfare (DW) architecture and standard efforts and verify cyber requirements are captured as part of the modeling process. -Provide subject matter expert support for data science teams in the exploration of data analysis, information and knowledge extraction techniques and application to mission area requirements. -Participate in the definition of MBSE tool functionality and views based on Echelon I stakeholder requirements. -Collaboratively develop tool extensions to complement JCIDS and Program Objective Memorandum (POM) processes. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease due to realignment of FY19 funds to the DW PE (0604027N) beginning in FY19.					
Accomplishments/Planned Programs Subtotals	0.000	5.950	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3425 / *Digital Warfare*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

DW is a non-acquisition effort that informs and matures Navy decisions, which in turn impacts acquisition programs.

E. Performance Metrics

Digital Warfare (DW) Performance Metrics: Goal: Chief of Naval Operations (CNO) to set requirement, to prioritize resources, and lead efforts on information interoperability and human/machine testing. Metric: Echelon I development of requirements associated with modeling, data science experimentation environment, and digital architectures.

The DW will set requirements, prioritize resources, and lead efforts on information interoperability and human/machine teaming. This will result in a workforce that is trained in new systems engineering and modeling concepts and tools. It will also result in development of a requirements modeling environment to include associated model extensions, reports, views, and configuration management and in the development of digital technical baselines for programs to use to ensure cross-domain interoperability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 3425 / *Digital Warfare*	

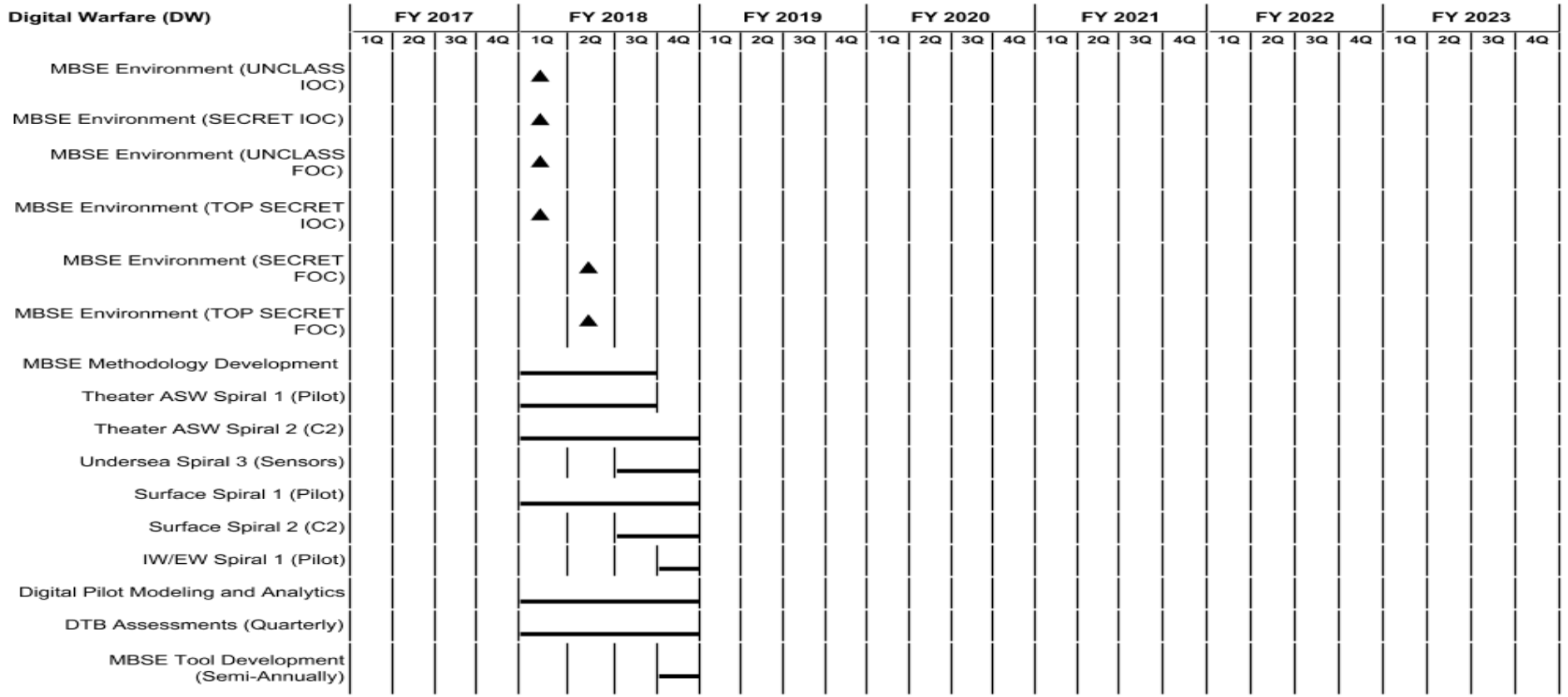
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Warfare (DW)	WR	SSC PAC : San Diego, CA	0.000	0.000		0.600	Dec 2017	0.000		-		0.000	0.000	0.600	-
Digital Warfare (DW)	WR	SSC LANT : Charleston, SC	0.000	0.000		0.700	Dec 2017	0.000		-		0.000	0.000	0.700	-
Digital Warfare (DW)	FFRDC	MITRE : McLean, VA	0.000	0.000		0.350	Nov 2017	0.000		-		0.000	0.000	0.350	-
Digital Warfare (DW)	C/CPFF	VENCORE : Chantilly, VA	0.000	0.000		2.350	Dec 2017	0.000		-		0.000	0.000	2.350	-
Digital Warfare (DW)	C/CPFF	SAIC : McLean, VA	0.000	0.000		1.950	Jan 2018	0.000		-		0.000	0.000	1.950	-
		Subtotal	0.000	0.000		5.950		0.000		-		0.000	0.000	5.950	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		5.950		0.000		-		0.000	0.000	5.950	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3425 / *Digital Warfare*



2019PB - 0604231N - 3425

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 3425 / *Digital Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Digital Warfare (DW)				
MBSE Environment (UNCLASS IOC): MBSE Environment (UNCLASS IOC)	1	2018	1	2018
MBSE Environment (SECRET IOC): MBSE Environment (SECRET IOC)	1	2018	1	2018
MBSE Environment (UNCLASS FOC): MBSE Environment (UNCLASS FOC)	1	2018	1	2018
MBSE Environment (TOP SECRET IOC): MBSE Environment (TOP SECRET IOC)	1	2018	1	2018
MBSE Environment (SECRET FOC): MBSE Environment (SECRET FOC)	2	2018	2	2018
MBSE Environment (TOP SECRET FOC): MBSE Environment (TOP SECRET FOC)	2	2018	2	2018
MBSE Methodology Development: MBSE Methodology Development	1	2018	3	2018
Theater ASW Spiral 1 (Pilot): Theater ASW Spiral 1 (Pilot)	1	2018	3	2018
Theater ASW Spiral 2 (C2): Theater ASW Spiral 2 (C2)	1	2018	4	2018
Undersea Spiral 3 (Sensors): Undersea Spiral 3 (Sensors)	3	2018	4	2018
Surface Spiral 1 (Pilot): Surface Spiral 1 (Pilot)	1	2018	4	2018
Surface Spiral 2 (C2): Surface Spiral 2 (C2)	3	2018	4	2018
IW/EW Spiral 1 (Pilot): IW/EW Spiral 1 (Pilot)	4	2018	4	2018
Digital Pilot Modeling and Analytics: Digital Pilot Modeling and Analytics	1	2018	4	2018
DTB Assessments (Quarterly): DTB Assessments (Quarterly)	1	2018	4	2018
MBSE Tool Development (Semi-Annually): MBSE Tool Development (Semi-Annually)	4	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 9123 / *FORCEnet*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9123: *FORCEnet*	236.974	2.854	2.399	2.209	-	2.209	2.181	2.225	2.271	2.316	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FORCEnet is the Navy and Marine Corps initiative to deliver Information Warfare (IW) and achieve Department of the Navy (DoN)/Department of Defense (DoD) Transformation, Joint/Allied/Coalition Interoperability, implementing Maritime Domain Awareness (MDA), and Net-Centric Operations/Warfare (NCO/W). Chief of Naval Operations (CNO) IW effort focuses prioritization and organizational responsibility for IW, cyber, intelligence and sensors resulting in increased scope of systems, platforms and mission areas. FORCEnet is a foundation of Sea Power 21, Naval Power 21, which is the Naval Operating Concept (NOC) for Joint Operations, and the DoN's Naval Transformation Roadmap.

Funding supports IW Portfolio Health Assessments (PHAs) of Navy mission areas and identifies gaps in IW capabilities in the context of assessed mission areas. Funds support vignettes, technical baselines, architecture products, and briefings developed to support sponsor decision making processes.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: FORCEnet	2.854	2.399	2.209	0.000	2.209
Articles:	-	-	-	-	-
FY 2018 Plans: -Expand upon System of Systems (SoS) mission engineering analyses and ongoing experimentation to iteratively mature the findings and outcomes, while increasing the support to a development of a Limited Operational Capability. -Continue to provide analytical support to ensure that cybersecurity risk assessments and engineering activities are informed by Navy Cybersecurity Situational Awareness (NCSA) capabilities as addressed by the PHA. -Continue to utilize and study Navy mission areas in support of SoS engineering assessments identifying integration and interoperability gaps, trades, and solutions for sponsor related equities. -Continue to identify Navy mission area gaps in IW capabilities to Science and Technology (S&T) efforts for future budget decisions. Continue to identify critical architectural dependencies that enable mission situational awareness, which is a key component of the PHAs. -Continue to assess tradespace and solutions, ensuring Force level SoS integration and interoperability in studied mission areas. -Continue to package assessments to support sponsor decision-making processes.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 9123 / *FORCEnet*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Expand upon SoS mission engineering analyses and ongoing experimentation to iteratively mature the findings and outcomes, while increasing the support to a development of a Limited Operational Capability. -Continue to utilize and study Navy mission areas in support of System of Systems (SoS) engineering assessments identifying integration and interoperability gaps, trades, and solutions for sponsor related equities. -Continue to identify Navy mission area gaps in Information Warfare (IW) capabilities to prioritize Science and Technology (S&T) efforts for future budget decisions. Continue to identify critical architectural dependencies that enable mission situational awareness, which is a key component of the Portfolio Health Assessments (PHAs). -Continue to assess tradespace and solutions, ensuring Force level capability and SoS integration and interoperability in studied mission areas. -Continue to package assessments to support sponsor decision-making processes. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $190K decrease to FORCEnet between FY18 to FY19 is attributed to the completion of Navy Cybersecurity Situational Awareness (NCSA) analytical support as addressed by the PHA, and therefore, the program will no longer receive funding for NCSA in FY19 and out.					
Accomplishments/Planned Programs Subtotals	2.854	2.399	2.209	0.000	2.209

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

FORCEnet is a non-acquisition effort that informs and matures Navy decisions, which in turn impacts acquisition programs. Activities include acquiring intellectual capital in emerging technical areas through contracts providing technical engineering expertise and surge capacity for emerging tasks.

E. Performance Metrics

Goal: Chief of Naval Operations (CNO) strategic planning and supporting acquisition of classified efforts.
Metric: Echelon I response to emergent strategic needs and classified warfighting capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 9123 / *FORCEnet*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development and Systems Engineering	Various	Various : Various	4.331	0.000		0.000		0.000		-		0.000	0.000	4.331	-
		Subtotal	4.331	0.000		0.000		0.000		-		0.000	0.000	4.331	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development and Logistics Support	Various	Various : Various	136.842	0.000		0.000		0.000		-		0.000	0.000	136.842	-
Information Warfare Roadmaps and Analysis	C/CPFF	SAIC : McLean, VA	8.524	2.171	Mar 2017	1.824	Mar 2018	1.712	Mar 2019	-		1.712	Continuing	Continuing	Continuing
Information Warfare Roadmaps and Analysis	WR	SSC LANT : Charleston, NC	2.118	0.427	Mar 2017	0.359	Mar 2018	0.497	Mar 2019	-		0.497	Continuing	Continuing	Continuing
Information Warfare Roadmaps and Analysis	C/CPFF	BAH : McLean, VA	0.206	0.256	Mar 2017	0.216	Mar 2018	0.000		-		0.000	0.000	0.678	-
		Subtotal	147.690	2.854		2.399		2.209		-		2.209	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Accelerating Joint Warfighting Capability	Various	Various : Various	77.271	0.000		0.000		0.000		-		0.000	0.000	77.271	-
		Subtotal	77.271	0.000		0.000		0.000		-		0.000	0.000	77.271	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Technical Support	Various	Various : Various	7.682	0.000		0.000		0.000		-		0.000	0.000	7.682	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604231N / *Tactical Command System*	Project (Number/Name) 9123 / *FORCEnet*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			7.682	0.000		0.000		0.000		-		0.000	0.000	7.682	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	236.974	2.854		2.399		2.209		-		2.209	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 9123 / *FORCEnet*

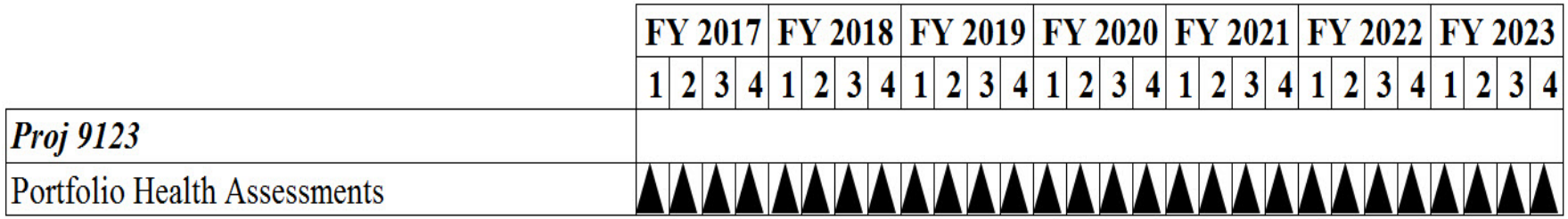


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604231N / *Tactical Command System*	**Project (Number/Name)** 9123 / *FORCEnet*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9123				
Naval Information Warfare Enterprise	1	2017	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604234N *I Advanced Hawkeye*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	4,598.041	354.390	292.535	223.565	-	223.565	225.063	191.126	230.692	261.682	0.000	6,377.094
3051: *E-2D Adv Hawkeye*	4,589.834	344.718	292.535	223.565	-	223.565	225.063	191.126	230.692	261.682	0.000	6,359.215
9999: *Congressional Adds*	8.207	9.672	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.879
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 364												

A. Mission Description and Budget Item Justification

The E-2D Advanced Hawkeye (AHE) program develops, demonstrates, tests, and procures the replacement of the AN/APS-145 radar system and other aircraft system components including Cooperative Engagement Capability Pre-Planned Product Improvement and Dual Transmit Satellite Communications that improve the E-2 weapon system to maintain open ocean mission capability while providing the United States Navy with an effective littoral surveillance, battle management, Naval Integrated Fire Control - Counter Air (NIFC-CA) and Theater Air and Missile Defense (TAMD) capability. Key radar technologies are Space-Time Adaptive Processing, Electronically Scanning Array, solid state transmitter, high dynamic range digital receivers and Identification Friend or Foe (IFF)/radar aperture integration. The resultant detection system provides a substantially improved overland performance by correcting current sensor shortfalls and enhancing all current required mission areas, while simultaneously contributing to the emerging TAMD mission requirements. Mode 5 is an upgrade to the existing IFF System providing the warfighter positive, secure and reliable identification of friendly aircraft, surface and sub-surface platforms. Mode 5 replaces the National Security Administration de-certified Mode 4 IFF capability, which is no longer effective or suitable for modern military operations. Mode 5 will support the Joint Initial Operational Capability (IOC) as defined by the Joint Requirements Oversight Council.

The Navy declared IOC for the E-2D in October 2014 with the first operational deployment in FY15. The System Development and Demonstration contract completed in FY15 as the program transitions into the production, deployment, and sustainment phase. Throughout the development of the E-2D, the threat has continued to evolve increasing in both capability and capacity. The E-2D Research, Development, Test and Evaluation budget after IOC reflects the Navy's further investment into the E-2D to ensure that carrier based command and control continues to pace the FY2020 and beyond threat in support of Navy and Joint operations around the world.

The program will be aligning the capability development in areas where there are interwoven technologies that leverage each other to provide the most efficient and cost effective means of delivering these capabilities to the warfighters. The program will deliver these capabilities to the Fleet users on approximately a 24 month release cycle as part of combined Delta System/Software Configuration (DSSC) builds. The baseline IOC configuration is named DSSC build 1 (DSSC-1). The DSSC build schedule is outlined along with the capabilities that are planned to comprise each DSSC build. If a capability is delayed or accelerated it will move between DSSC builds which will be reflected in updates to this budget.

DSSC-2 Fleet released in August FY16. DSSC-2 incorporates several technologies developed under the System Development and Demonstration phase which include Dual Transmit Satellite Communications and an IFF technology refresh in preparation for Mode 5 and Mode S.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604234N *I Advanced Hawkeye*

DSSC-2.1 incorporates IFF Mode 5 capability early release to operational squadrons ahead of formal DSSC 3 release.

DSSC-3 is planned for operational test and Fleet release in FY19. DSSC-3 is comprised of the following capabilities:
E-2D Accelerated Mid-Term Interoperability Improvement Program, NIFC-CA enhancements, Automatic Identification System, Embedded National Tactical Receiver, and Crypto Modernization/Frequency Remapping.

DSSC-3AR is planned for operational test and Fleet release in FY19. DSSC-3AR is comprised of all capabilities listed in DSSC-3 plus Aerial Refueling.

DSSC-4 is planned for operational test in FY21 and Fleet release in FY21. DSSC-4 provides critical capabilities needed to pace the 2020 threat and enabling components of NIFC-CA increment 3. DSSC-4 is comprised of the following capabilities: E-2D Multifunctional Information Distribution System/Joint Tactical Radio System, Tactical Targeting Networking Technology, Secret Internet Protocol Router Chat, Data Fusion (phase 1), Fighter to Fighter Backlink, E-2D Navigation Warfare and E-2D Counter Electronic Attack.

DSSC-5 is planned for operational test in FY23 and Fleet release in FY23. DSSC-5 provides the capabilities necessary for E-2D to meet NIFC-CA increment 3 requirements and is comprised of the following: Sensor Netting, Stores Performance Assessment Requested Quality, Data Fusion (Phase 2) and E-2D AN/ALQ-217 Electronic Support Measures.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	363.792	292.535	218.671	-	218.671
Current President's Budget	354.390	292.535	223.565	-	223.565
Total Adjustments	-9.402	0.000	4.894	-	4.894
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-10.779	0.000			
• Program Adjustments	0.000	0.000	7.868	-	7.868
• Rate/Misc Adjustments	0.000	0.000	-2.974	-	-2.974
• Congressional General Reductions Adjustments	-0.009	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604234N *I Advanced Hawkeye*			
• Congressional Directed Reductions	-8.614	-	-	-	-
Adjustments					
• Congressional Add Adjustments	10.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Adv Radar Innovation Fund - Air (Cong)*	9.672	0.000
Congressional Add Subtotals for Project: 9999	9.672	0.000
Congressional Add Totals for all Projects	9.672	0.000

Change Summary Explanation

Technical: N/A

Schedule:

1. Updated Advanced Hawkeye schedule for the Test and Evaluation section to include DSSC 2.1.
2. Updated TTNT High Power Amplifier (HPA) milestones to support PMA/W 101 shift to HPA Variant 7.
3. Updated SIPRChat TRR, HW/SW Dev & Integration due to emergent Cyber Cross Domain Solution (CDS) requirements. Updated Data fusion to reflect Phase 1 and Phase 2.
4. Updated Crypto Modernization /Frequency Remapping milestones and DT due to delays in the PMA/W-101 CMN4 program.
5. Updated Counter Electronic Attack (CEA) schedule to move Critical Design Review from 3Q FY17 to 1Q FY18. Delay due to late start of Data Fusion due to additional mulit-level security capability requirements to CEA. Updated to reflect CEA phase 2 schedule beginning FY19.
6. Updated Fighter to Fighter Backlink schedule to reflect late start of FY17 new start efforts.

The FY 2019 funding request was reduced by $0.632M to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604234N / *Advanced Hawkeye*	Project (Number/Name) 3051 / *E-2D Adv Hawkeye*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3051: *E-2D Adv Hawkeye*	4,589.834	344.718	292.535	223.565	-	223.565	225.063	191.126	230.692	261.682	0.000	6,359.215
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 364

A. Mission Description and Budget Item Justification

The E-2D Advanced Hawkeye (AHE) program develops, demonstrates, tests, and procures the replacement of the AN/APS-145 radar system and other aircraft system components including Cooperative Engagement Capability Pre-Planned Product Improvement and Dual Transmit Satellite Communications that improve the E-2 weapon system to maintain open ocean mission capability while providing the United States Navy with an effective littoral surveillance, battle management, Naval Integrated Fire Control - Counter Air (NIFC-CA) and Theater Air and Missile Defense (TAMD) capability. Key radar technologies are Space-Time Adaptive Processing, Electronically Scanning Array, solid state transmitter, high dynamic range digital receivers and Identification Friend or Foe (IFF)/radar aperture integration. The resultant detection system provides a substantially improved overland performance by correcting current sensor shortfalls and enhancing all current required mission areas, while simultaneously contributing to the emerging TAMD mission requirements. Mode 5 is an upgrade to the existing IFF System providing the warfighter positive, secure and reliable identification of friendly aircraft, surface and sub-surface platforms. Mode 5 replaces the National Security Administration de-certified Mode 4 IFF capability, which is no longer effective or suitable for modern military operations. Mode 5 will support the Joint Initial Operational (IOC) as defined by the Joint Requirements Oversight Council.

The Navy declared IOC for the E-2D in October 2014 with the first operational deployment in FY15. The System Development and Demonstration contract completed in FY15 as the program transitions into the production, deployment, and sustainment phase. Throughout the development of the E-2D, the threat has continued to evolve increasing in both capability and capacity. The E-2D Research, Development, Test and Evaluation budget after IOC reflects the Navy's further investment into the E-2D to ensure that carrier based command and control continues to pace the 2020 and beyond threat in support of Navy and Joint operations around the world.

The program will be aligning the capability development in areas where there are interwoven technologies that leverage each other to provide the most efficient and cost effective means of delivering these capabilities to the warfighters. The program will deliver these capabilities to the Fleet users on an approximately 24 month release cycle as part of combined Delta System/Software Configuration (DSSC) builds. The baseline IOC configuration is named DSSC build 1 (DSSC-1). The DSSC build schedule is outlined below along with the capabilities that are planned to comprise each DSSC build. If a capability is delayed or accelerated it will move between DSSC builds which will be reflected in updates to this budget.

DSSC-2 Fleet released in August FY16. DSSC-2 incorporates several technologies developed under the System Development and Demonstration phase which include Dual Transmit Satellite Communications and an IFF technology refresh in preparation for Mode 5 and Mode S.

DSSC-2.1 incorporates IFF Mode 5 capability early release to operational squadrons ahead of formal DSSC 3 release.

DSSC-3 is planned for operational test and Fleet release in FY19. DSSC-3 is comprised of the following capabilities:

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

1. The E-2D Accelerated Mid-Term Interoperability Improvement Program (AMIIP) will address the most severe Cooperative Engagement Capability and data link related interoperability issues. This capability will significantly improve the quality of the tactical surveillance picture across all participants, reduce the possibility of track mis-identification and mitigate Blue on Blue engagements. AMIIP provides stable sensor fusion foundation to support sensor/weapon coordination requirements.

2. NIFC-CA enhancements will incorporate weapon system software improvements to implement capabilities and performance improvements needed to meet NIFC-CA increment 2 requirements. These capabilities come from software development in both the E-2D Classified and NIFC-CA Enhancement and Testing lines.

3. Crypto Modernization/Frequency Remapping: The E-2D Multifunctional Information Distribution System/Joint Tactical Radio System (MIDS/JTRS) with concurrent Multi-netting will be integrated into the E-2D. This effort includes replacing the Multifunctional Information Distribution System-Low Volume Terminal (MIDS LVT) radio with MIDS/JTRS that has incorporated Link-16 concurrent Multi-netting (CMN-4) and replacing the JTIDS High Power Amplifier Group with a Link-16 High Power Amplifier which will address Crypto Modernization and Frequency Remapping.

DSSC-3AR is planned for operational test and Fleet release in FY19. DSSC-3AR is comprised of all capabilities listed in DSSC-3 plus Aerial Refueling (AR).

1. An AR capability will allow the E-2D AHE to receive fuel from various organic and non-organic tanker aircraft. It provides Expanded Battle Space Surveillance and Targeting through significantly enhanced persistence and increased flexibility (range & endurance). AR will better enable the E-2D AHE to fully support current Carrier Strike Group /Joint 24/7 Theater Operations by providing more versatile stationing and/or forward basing options. Previous domestic E-2 concept demonstration effort successfully established the feasibility of tanking behind the F/A-18E/F and KC-130 aircraft under E-2 Squadrons, PE 0204152N.

DSSC-4 is planned for operational test in FY21 and Fleet release in FY21. DSSC-4 provides critical capabilities needed to pace the 2020 threat and enabling components of NIFC-CA increment 3. DSSC-4 is comprised of the following capabilities:

1. The E-2D Multifunctional Information Distribution System/Joint Tactical Radio System (MIDS/JTRS)Tactical Targeting Networking Technology (TTNT) integrates Advanced Tactical Data Link functionality into the E-2D. This effort includes replacing the MIDS LVT radio with MIDS/JTRS that has incorporated Link-16 Concurrent Multi-Netting and TTNT. MIDS/JTRS TTNT is a key enabler for E-2D sensor netting capability in support of the NIFC-CA mission.

2. The E-2D Secret Internet Protocol Router Chat capability will support integration of current collaboration tools including tactical "chat" (text) communications, real-time tasking, and Air Tasking Order distribution. Recent real world operations have demonstrated a migration of Command and Control communications from voice to Internet protocol based networks.

3. E-2D Data Fusion Phase 1 provides a fusion engine to blend all on-board sensor derived track data (e.g. Electronic Surveillance) with already blended radar, Identify Friend or Foe and Cooperative Engagement Capability track files, enhancing situational awareness and tactical decision making. Successful E-2D NIFC-CA engagements depend on a clear/unambiguous tactical picture and the shortest possible decision pipeline.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

4. E-2D Fighter to Fighter backlink implements Link-16 Network Participation Group 20 messages for Fighter-to-Fighter backlink capability in E-2D. This functionality improves interoperability between E-2D and participating US Navy fighters, including 5th generation aircraft, enhancing combat effectiveness of E-2D, increases situational awareness and shortens kill-chain timelines (including NIFC-CA).

5. E-2D Navigation Warfare (NAVWAR) prevents loss of Global Positioning System (GPS) by using a Controlled Reception Pattern Antenna (CRPA) and antenna electronics (AE) unit which will function to provide GPS access in an Electronic Attack (EA) environment. NAVWAR significantly reduces the likelihood of loss of critical GPS Position, Navigation and Timing functionality that is fundamental to E-2D battlespace awareness and its contributions to multiple link networks.

6. The E-2D Counter Electronic Attack (CEA) capability will allow the E-2D radar system to maintain performance in an advanced hostile intentional electromagnetic interference environment. The E-2D CEA program will ensure E-2D effectiveness is maintained in an Electronic Attack environment supporting the NIFC-CA capability and overall Navy and Joint Integrated Air and Missile Defense strategy.

DSSC-5 is planned for operational test in FY23 and Fleet release in FY23. DSSC-5 provides the capabilities necessary for E-2D to meet NIFC-CA increment 3 requirements and is comprised of the following capabilities:

1. E-2D Sensor Netting provides fusion of data from off-board sources via a high bandwidth network that will allow E-2D to support the second spiral of performance improvement for NIFC-CA capability. Additional details are classified.

2. E-2D Stores Performance Assessment Requested Quality (SPARQ) establishes real-time requirements for E-2D sensor contribution to system of system NIFC-CA solutions. SPARQ expands and optimizes operational employment envelopes, improving Air Wing ability to take advantage of System of System capabilities of NIFC-CA, reducing kill chain timelines.

3. E-2D Data Fusion Phase 2 provides a fusion engine to blend all off-board tactical data (e.g. Satellite Receiver System data) with already fused on-board tracks from the E-2D Data Fusion Phase 1 effort, completing the Data Fusion of all track sources available to E-2D and greatly enhancing situational awareness and tactical decision making. Successful E-2D NIFC-CA engagements depend on a clear/unambiguous tactical picture and the shortest possible decision pipeline.

4. E-2D AN/ALQ-217 Electronic Support Measures (ESM) Combat Identification (CID) upgrades integrates digital receiver and processing technology, enables E-2 multi-ship geo-location and Time Difference Of Arrival with other sensors across L-16 and Tactical Targeting Networking Technology (TTNT), and provides a precision internal clock source to enable netted detection of advanced threat radar systems. Connectivity to Electronic Warfare (EW) netted sensors will provide multiple nodes, real time, enhanced CID capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Full Scale Fatigue Test	11.490	18.236	10.541	0.000	10.541
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Full Scale Fatigue Test efforts for the E-2D Advanced Hawkeye Program. The USN requires that a fatigue test be conducted on the E-2D aircraft to determine the design service life of the airframe. Durability testing is being performed on a test article that is representative of production aircraft. The objective of the 20,000 equivalent flight hours fatigue test is to identify fatigue critical locations, substantiate the 10,000 flight hours service life for the E-2D airframe fuselage and horizontal stabilizer, and demonstrate that the E-2D aircraft structure satisfies the program service life requirement. ***FY 2018 Plans:*** Funds provided for continued support of Full Scale Fatigue Tests. The test program will continue towards the final goal of 20,000 test hours. Inspections and analysis will be performed at 500 effective flight hour intervals. Effort to configure and instrument replacement Outer Wing Panels will continue at the 10,000 hour interval. Repairs of the test article will be conducted as required. ***FY 2019 Base Plans:*** Funds provided for continued support of Full Scale Fatigue Tests. The test program will continue towards the final goal of 20,000 test hours. Inspections and analysis will be performed at 500 effective flight hour intervals. Effort to configure and instrument replacement Outer Wing Panels will continue at the 10,000 hour interval. Repairs of the test article will be conducted as required. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased from FY18 to FY19 due to revised program plan.					
Title: Delta System/Software Configuration (DSSC) Integration and Test	21.254	15.266	15.098	0.000	15.098
Articles:	-	-	-	-	-
Description: Funds integration, engineering, risk reduction efforts, developmental and operational test of E-2D. ***FY 2018 Plans:*** Funding provided for the continuation of DSSC 3 risk reduction integration and engineering test. ***FY 2019 Base Plans:*** Funding provided for DSSC 3 Operational Test and DSSC 3 Fleet Release. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Title: E-2D Classified Programs	19.833	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Provides support for the E-2D Advanced Hawkeye Classified Development efforts. Development and Integration of E-2D specific NIFC-CA Increment 2-3 improvements. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A					
Title: Aerial Refueling	81.486	64.326	21.697	0.000	21.697
Articles:	-	-	-	-	-
Description: Funds the system development and testing to support the incorporation of Aerial Refueling (AR) capability into the E-2D AHE aircraft. Emphasis during system development is on system redesign, air vehicle design, human systems integration and design, including interior/lighting modifications and seat replacement. Flight testing is required to evaluate fuel systems changes, aerial refueling capability, field of view, thermal and aerodynamic loads, kinematic performance, and handling qualities. Planned for DSSC-3AR ***FY 2018 Plans:*** Funding provided for developmental flight test to include hardware functionality, handling qualities evaluation and envelope expansion with five threshold tankers (F/A-18,KC-130,KC-10,KC-135 and OMEGA). Additionally, funding provided for physical configuration audit (PCA). ***FY 2019 Base Plans:*** Funding provided for operational test readiness review and hardware and software development. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased from FY18 to FY19 due to completion of developmental test & evaluation.					
Title: E-2D Counter Electronic Attack ***Articles:*** ***Description:*** Funds the mission system development and testing of the capability to counter advanced radar electronic attack threats. The E&MD effort will focus on integration of capabilities in the radar and mission computer display systems that include system integration, and laboratory and flight test validation. Planned for DSSC-4. ***FY 2018 Plans:*** Funds provided for the continuation of software development, mission computer and radar system development to provide the Counter Electronic Attack (CEA) solution. Conduct Critical Design Review ***FY 2019 Base Plans:*** Program will conduct Test Readiness Review, Functional Readiness Review and begin developmental test for phase 1. Begin requirement development for phase 2. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increased from FY18 to FY19 due to requirements development for phase 2.	28.512 -	22.214 -	23.178 -	0.000 -	23.178 -
Title: Multifunctional Information Distribution System/Joint Tactical Radio System (MIDS/JTRS)Tactical Targeting Networking Technology (TTNT) ***Articles:*** ***Description:*** MIDS/JTRS TTNT provides Advanced Tactical Data Link functionality into the E-2D. This effort includes replacing the Multifunctional Information Distribution System - Low Volume Terminal (MIDS LVT) radio with MIDS/JTRS that has incorporated Link-16 concurrent Multi-netting (CMN-4) and TTNT. MIDS/JTRS TTNT is a key enabler for E-2D sensor netting capability in support of the Naval Integrated Fire Control-Counter Air mission. Planned for DSSC-4. ***FY 2018 Plans:***	41.734 -	11.539 -	9.781 -	0.000 -	9.781 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funds provided for continuation of aircraft hardware/software integration development. Conduct Critical Design Review. Start lab testing for preparation for Test Readiness Review. ***FY 2019 Base Plans:*** Funds provided for continuation of capability development and integration. Conduct TTNT High Power Amplifier Development & TTNT integration test readiness review. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased from FY18 to FY19 due to HW/SW development & design completion					
Title: SIPR Chat	15.000	5.500	2.782	0.000	2.782
Articles:	-	-	-	-	-
Description: The E-2D Secret Internet Protocol Router (SIPR) Chat capability will support integration of current collaboration tools including tactical "chat" (text) communications, real-time tasking, and Air Tasking Order distribution. Recent real world operations have demonstrated a migration of Command and Control communications from voice to Internet protocol based networks. Planned for DSSC-4. ***FY 2018 Plans:*** Funds provided for continued System Development & Design, Critical Design Review, Test Readiness Review and start of Developmental Test to support and enable SIPRChat capability. ***FY 2019 Base Plans:*** Funds provided for continued System Development & Design and Developmental Test. Conduct Functional Readiness Review to support and enable SIPRChat capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased from FY18 to FY19 due to HW/SW development & integration completion (2QFY19).					
Title: Naval Integrated Fire Control - Counter Air Testing (NIFC-CA)	49.773	38.296	25.973	0.000	25.973
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: NIFC-CA requires System of Systems level testing. Assesses and addresses Naval weapon systems' Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance gaps. Planned for DSSC-3. ***FY 2018 Plans:*** Funds provided for continued NIFC-CA flight test. Additionally, continues E-2D participation in NIFC-CA increment 1-3 developmental and operational systems of systems ground, simulation, and flight testing. Continues fleet training development for NIFCCA capabilities. ***FY 2019 Base Plans:*** Funds provided for continued NIFC-CA flight test. Additionally, continues E-2D participation in NIFC-CA increment 1-3 developmental and operational systems of systems ground, simulation, and flight testing. Continues fleet training development for NIFCCA capabilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased from FY18 to FY19 due to FY18 funding satisfying NIFC-CA training requirements.					
Title: Accelerated Mid-Term Interoperability Improvement Program (AMIIP)	11.988	3.779	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Address the most severe data link related interoperability issues. This capability will significantly improve the quality of the tactical surveillance picture, reduce the possibility of leakers, mitigate Blue on Blue engagements and mid-identification of tracks. Provides stable sensor fusion foundation to support sensor/ weapon coordination requirements. Planned for DSSC-3. ***FY 2018 Plans:*** Funds provided to complete software integration development and flight test. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
Title: Sensor Netting	9.490	17.380	19.708	0.000	19.708
Articles:	-	-	-	-	-
Description: Provides fusion of data from off-board sources via a high bandwidth network that will allow E-2D to support second spiral of performance improvements for Naval Integrated Fire Control-Counter Air Testing (NIFC-CA) capabilities. Additional details are classified. Planned for DSSC-5. ***FY 2018 Plans:*** Funds provided for continuation of system requirements development. Start of software development & integration of the mission computer and associated systems to provide the Sensor Netting solution. Program will conduct System Requirements Review. ***FY 2019 Base Plans:*** Funds provided for completion of system requirements development. Continuation of software development & integration of the mission computer and associated systems to provide the Sensor Netting solution. Program will conduct Integrated Baseline Review and Preliminary Design Review. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increased from FY18 to FY19 due to SW development and integration effort. In addition, Integrated Baseline Review & Preliminary Design Review also scheduled in FY19.					
Title: Data Fusion	14.493	18.617	15.279	0.000	15.279
Articles:	-	-	-	-	-
Description: E-2D Data Fusion Phase 1 provides a fusion engine to blend all on-board sensor derived track data (e.g. Electronic Surveillance) with already blended radar, Identify Friend or Foe and Cooperative Engagement Capability track files, enhancing situational awareness and tactical decision making. Successful E-2D NIFC-CA engagements depend on a clear/unambiguous tactical picture and the shortest possible decision pipeline. Planned for DSSC-4. E-2D Data Fusion Phase 2 provides a fusion engine to blend all off-board tactical data (e.g. Satellite Receiver System data) with already fused on-board tracks from the E-2D Data Fusion Phase 1 effort, completing the Data Fusion of all track sources available to E-2D and greatly enhancing situational awareness and tactical decision					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
making. Successful E-2D NIFC-CA engagements depend on a clear/unambiguous tactical picture and the shortest possible decision pipeline. Planned for DSSC 5. ***FY 2018 Plans:*** Funds provided to continue Phase 1 trade studies for the requirement development/system integration development. Program will conduct system requirements review and preliminary design review. ***FY 2019 Base Plans:*** Funds provided for Phase 1 to begin systems Engineering and Integration. Program will conduct Critical Design Review, Test Readiness Review and begin SIL test for Phase 1. Program will conduct a system requirements review and begin Requirements Development for Phase 2. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased from FY18 to FY19 based on completion of critical requirement development effort in FY18.					
Title: Fighter to Fighter Backlink	6.986	11.789	11.940	0.000	11.940
Articles:	-	-	-	-	-
Description: Fighter to Fighter backlink implements Link-16 Network Participation Group 20 messages for Fighter-to-Fighter backlink capability in E-2D. This functionality improves interoperability between E-2D and participating US Navy fighters, including 5th generation aircraft, enhancing combat effectiveness of E-2D, increases Situational Awareness (SA), and shortens kill-chain timelines (including NIFC-CA). Planned for DSSC-4. ***FY 2018 Plans:*** Funds provided to continue trade studies for the requirement development/system integration development. Program will conduct System Requirements Review and the Preliminary Design Review. ***FY 2019 Base Plans:*** Funds provided to begin Systems Engineering and Integration. Program will conduct a Critical Design Review, Test Readiness Review and begin SIL test. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
Title: Navigation Warfare (NAVWAR)	5.748	10.272	16.374	0.000	16.374
Articles:	-	-	-	-	-
Description: E-2D Navigation Warfare (NAVWAR) prevents loss of Global Positioning System (GPS)by using a Controlled Reception Pattern Antenna (CRPA) and Antenna Electronics (AE) unit which will function to provide GPS access in an Electronic Attack (EA) environment. NAVWAR significantly reduces the likelihood of loss of critical GPS Position, Navigation and Timing functionality that is fundamental to E-2D battlespace awareness and its contributions to multiple link networks. Without NAVWAR capability, the E-2D AHE will be unable to provides its services in GPS contested airspace, putting Navy units at unacceptable risk and hindering Joint operational flexibility. NAVWAR capability will allow the E-2D AHE to operate in areas where signal disruption and jamming would prohibit unprotected GPS reception. With this new capability, the E-2D AHE will be able to provide continuous operations in a degraded GPS environment for mission areas that depend on GPS for precise position, navigation, and timing. Planned for DSSC-4. ***FY 2018 Plans:*** Funds provided to continue system engineering and integration development. Program will conduct System Requirements Review/System Functional Review, Preliminary Design Review and Critical Design Review. Begin hardware & software development. ***FY 2019 Base Plans:*** Funds provided to complete system engineering and integration development. Program will conduct Test Readiness Review and Functional Readiness Review. Complete hardware & software development. SIL testing and Developmental Test will also begin. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increased from FY18 to FY19 due to scheduled SIL test and developmental test.					
Title: Stores Performance Assessment Requested Quality (SPARQ)	6.345	9.799	8.003	0.000	8.003
Articles:	-	-	-	-	-
Description: E-2D Stores Performance Assessment Requested Quality (SPARQ) establishes real-time requirements for E-2D sensor contribution to system of system Naval Integrated Fire Control-Counter Air (NIFC-CA) solutions. SPARQ expands and optimizes operational employment envelopes, improving Air Wing ability					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
to take advantage of System of System capabilities of NIFC-CA, reduces operational workload and latency of execution. Planned for DSSC-5. ***FY 2018 Plans:*** Funds provided for continuation of system requirements development. Start of software development of the mission computer and associated systems to provide the SPARQ solution. Program will conduct System Requirements Review and Integrated Baseline Review. ***FY 2019 Base Plans:*** Funds provided for completion of system requirements development. Continuation of software development of the mission computer and associated systems to provide the SPARQ solution. Program will conduct Preliminary Design Review (PDR). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased from FY18 to FY19 due to requirements development completion (2QFY19).					
Title: ALQ-217 Electronic Support Measures Upgrade ***Articles:*** ***Description:*** ALQ-217 digital upgrade greatly enhances Combat Identification (CID), battle space awareness, and effectiveness of blue forces. Combat Identification (#3) requirements and networked sensor systems are specifically called out on COMACCLOGWING's FY15 E-2D Naval Aviation Readiness Group (NARG). Planned for DSSC-5. ***FY 2018 Plans:*** Funds provided for the continuation of system requirement development. Start hardware and software development & integration, providing increase Electronic Support Measures (ESM)capability against advanced enemy threats. Program will conduct System Requirements Review & System Functional Review. Conduct Preliminary Design Review. ***FY 2019 Base Plans:*** Funds provided for the continuation hardware and software development & integration. Conduct Critical Design Review (CDR). ***FY 2019 OCO Plans:***	15.638 -	28.956 -	30.434 -	0.000 -	30.434 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increased from FY18 to FY19 to due to plan workload for HW/SW development & integration in FY19 including CDR.					
Title: Crypto Modernization/Frequency Remapping	4.948	16.566	12.777	0.000	12.777
Articles:	-	-	-	-	-
Description: The E-2D Multifunctional Information Distribution System/Joint Tactical Radio System (MIDS/ JTRS) with concurrent Multi-netting will be integrated into the E-2D. This effort includes replacing the Multifunctional Information Distribution System-Low Volume Terminal (MIDS LVT) radio with MIDS/JTRS that has incorporated Link-16 concurrent Multi-netting (CMN-4) and replacing the JTIDS High Power Amplifier Group with a Link-16 High Power Amplifier which will address Crypto Modernization and Frequency Remapping. Planned for DSSC-4. ***FY 2018 Plans:*** Funds are provided to continue hardware & software development & integration. Conduct Critical Design Review and prepare for Test Readiness Review. ***FY 2019 Base Plans:*** Funds are provided to continue hardware & software development & integration. Conduct Test Readiness Review and Functional Readiness Review. Begin lab testing and start developmental test. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreases from FY18 to FY19 due to current program plan.					
Accomplishments/Planned Programs Subtotals	344.718	292.535	223.565	0.000	223.565

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0195: *E-2D AHE*	1,154.569	1,004.913	844.719	-	844.719	860.120	858.763	1,012.765	1,521.823	197.653	18,381.173
• APN/0605: *Initial Spares - E-2*	20.371	14.325	12.497	-	12.497	22.997	16.428	4.159	4.261	Continuing	Continuing
• APN/0544: *E-2 Series*	26.726	97.563	86.280	-	86.280	112.667	210.933	234.327	238.948	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

Milestone C Acquisition Strategy was approved by Milestone Decision Authority, Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L))on 29 Dec 2008. Milestone C approval to proceed into Production and Deployment was given 11 June 2009 by USD (AT&L). Certification for entrance into Initial Operational Test & Evaluation was received on 06 Feb 2012. Full Rate Production Acquisition Strategy approved on 20 August 2012. Initial Operational Test & Evaluation concluded 1 October 2012. Successfully held a Defense Acquisition Board for Full Rate Production. Received a successful decision to enter into Full Rate Production on 01 March 2013. Initial Operational Capability achieved on 10 October 2014.

E. Performance Metrics

Successfully met the Delta System/Software Configuration (DSSC) milestones.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604234N / *Advanced Hawkeye*	Project (Number/Name) 3051 / *E-2D Adv Hawkeye*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware-Fatigue	C/CPFF	Northrop Grumman Corporation (NGC) : Melbourne, FL	18.476	11.176	Dec 2016	17.436	Nov 2017	9.530	Nov 2018	-		9.530	62.921	119.539	119.539
Primary Hardware Dev-AMIIP/SIPRChat & TTNT	C/CPIF	Northrop Grumman Corporation (NGC) : Melbourne, FL	60.630	38.454	Mar 2017	10.271	Dec 2017	9.845	Nov 2018	-		9.845	5.898	125.098	125.098
Primary Hardware Dev-TTNT	SS/FFP	Data Link Solutions : Cedar Rapids, IA	13.356	7.212	Apr 2017	1.619	Dec 2017	0.000		-		0.000	0.000	22.187	22.187
Primary Hardware Dev - TTNT	SS/CPFF	ViaSat : Carlsbad, CA	1.100	4.147	Jun 2017	0.000		0.000		-		0.000	0.000	5.247	5.247
Primary Hardware-Aerial Refueling	SS/CPIF	Northrop Grumman Corporation (NGC) : Melbourne, FL	197.565	56.464	Oct 2016	31.797	Oct 2017	12.662	Oct 2018	-		12.662	0.000	298.488	298.488
Primary Hardware Dev-NAVWAR	SS/CPFF	Northrop Grumman Corporation (NGC) : Melbourne, FL	0.000	2.380	Aug 2017	7.807	Dec 2017	4.144	Dec 2018	-		4.144	4.910	19.241	19.241
Primary Hardware Dev - TTNT	SS/CPFF	NorthStar Scientific Corp. : Kapole, HI	4.914	3.720	Aug 2017	0.000		0.000		-		0.000	0.000	8.634	8.634
Primary Hardware Dev - CMFR	C/CPFF	Northrop Grumman Corporation : Melbourne, FL	0.000	3.200	Aug 2017	5.000	Dec 2017	0.000		-		0.000	0.000	8.200	8.200
Primary Hardware Dev - ESM	C/CPFF	Lockheed Martin : New York, NY	0.000	6.043	Sep 2017	6.079	Dec 2017	16.650	Dec 2018	-		16.650	19.761	48.533	48.533
Primary Hardware Dev - CEA	C/CPFF	Navy Syst Mgt Activity : Arlingron, VA	0.000	0.000		0.000		3.055	Dec 2018	-		3.055	138.639	141.694	141.694
Training Development	SS/FFP	Rockwell Collins : Cedar Rapids, IA	2.747	14.877	Feb 2017	17.176	Dec 2017	4.060	Dec 2018	-		4.060	11.416	50.276	50.276
Primary Software Development	Various	Navy Syst Mgt Activity : Arlington, VA	29.477	53.917	Dec 2016	25.215	Dec 2017	22.792	Dec 2018	-		22.792	522.947	654.348	654.346
Primary Software Development	Various	Various : Various	1.961	3.262	Feb 2017	0.000		0.000		-		0.000	0.000	5.223	5.223

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604234N / *Advanced Hawkeye*	Project (Number/Name) 3051 / *E-2D Adv Hawkeye*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Software Development - ESM	C/CPFF	Lockheed Martin : New York, NY	0.000	2.990	Sep 2017	5.836	Dec 2017	9.607	Dec 2018	-		9.607	11.592	30.025	30.025
System Engineering	Various	Various : Various	0.913	0.000		0.000		1.227	Dec 2018	-		1.227	9.069	11.209	11.208
Prior Year Prod Dev costs no longer funded in FYDP	Various	Various : Various	3,598.030	0.000		0.000		0.000		-		0.000	0.000	3,598.030	-
		Subtotal	3,929.169	207.842		128.236		93.572		-		93.572	787.153	5,145.972	N/A

Remarks

Totals may not add due to rounding.
Primary Software Development, Navy Syst Mgt Activity cost category increased for PB-18 due to fact of life changes in contract award, funding was planned to be executed from Software Development Support Cost Category.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	Navy Syst Mgt Activity : Arlington, VA	22.920	0.500	Jun 2017	0.200	Dec 2017	0.200	Dec 2018	-		0.200	1.204	25.024	-
Software Development-SN	Various	Navy Syst Mgt Activity : Arlington, VA	0.000	7.735	Jul 2017	14.784	Dec 2017	16.368	Dec 2018	-		16.368	27.601	66.488	-
Software Development-Data Fusion	Various	Navy Syst Mgt Activity : Arlington, VA	0.000	9.913	Jun 2017	14.821	Dec 2017	9.612	Dec 2018	-		9.612	22.699	57.045	-
Software Development-CEA	Various	Navy Syst Mgt Activity : Arlington, VA	1.370	0.652	Dec 2016	1.822	Dec 2017	1.343	Dec 2018	-		1.343	0.500	5.687	-
Software Development-SIPRChat	WR	SPAWAR : San Diego	8.559	2.774	Dec 2016	0.000		0.000		-		0.000	0.000	11.333	11.333
Software Development-TTNT	SS/CPIF	Northrop Grumman Corporation (NGC) : Melbourne, FL	0.200	0.000		1.583	Dec 2017	0.000		-		0.000	0.000	1.783	1.783

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604234N / *Advanced Hawkeye*	Project (Number/Name) 3051 / *E-2D Adv Hawkeye*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development-F2F	SS/CPIF	Northrop Grumman Corporation (NGC) : Melbourne, FL	0.000	6.427	Jun 2017	9.712	Dec 2017	3.560	Dec 2018	-		3.560	10.146	29.845	29.845
Software Development-NAVWAR	SS/CPIF	Northrop Grumman Corporation (NGC) : Melbourne, FL	0.000	2.900	Jul 2017	0.931	Dec 2017	0.418	Dec 2018	-		0.418	0.320	4.569	4.569
Software Development - SPARQ	SS/CPIF	Northrop Grumman Corporation (NGC) : Melbourne, FL	0.000	6.017	Jul 2017	8.774	Dec 2017	7.163	Dec 2018	-		7.163	11.583	33.537	33.537
Software Development - ESM	SS/CPIF	Northrop Grumman Corporation : Melbourne, FL	0.000	0.000		2.215	Dec 2017	1.241	Dec 2018	-		1.241	0.000	3.456	3.456
Software Development - CMFR	SS/CPIF	Northrop Grumman Corporation : Melbourne, FL	0.000	1.748	Aug 2017	9.416	Dec 2017	8.197	Dec 2018	-		8.197	9.137	28.498	28.498
Government Engineering Support	WR	Naval Air Warfare Center Aircraft Division (NAWCAD : Pax River, MD	110.352	27.789	Nov 2016	18.619	Nov 2017	19.487	Dec 2018	-		19.487	70.742	246.989	-
Government Engineering Support	WR	Naval Air Warfare Center Training Systems Division : Orlando, FL	12.268	0.277	Nov 2016	0.472	Nov 2017	0.000		-		0.000	0.000	13.017	-
Government Engineering Support	Various	Various : Various	16.141	1.086	Nov 2016	0.497	Nov 2017	0.509	Nov 2018	-		0.509	0.120	18.353	-
Integrated Logistics Support	Various	Various : Various	9.846	0.926	Nov 2016	4.089	Nov 2017	3.035	Nov 2018	-		3.035	18.206	36.102	-
Contractor Engineering Support ETS	C/CPFF	Imagine One : Colonial Beach, VA	7.659	1.766	Dec 2016	0.000		0.000		-		0.000	0.000	9.425	9.425
Contractor Engineering Support ETS	C/CPFF	Precise : Lexington Park, MD	0.000	0.390	Jun 2017	1.258	Jan 2018	2.477	Jan 2019	-		2.477	9.403	13.528	13.528
Technical Data	Various	Various : Various	1.544	0.000		0.000		0.000		-		0.000	0.000	1.544	-
Prior Year Support costs no longer funded in FYDP	Various	Various : Various	100.725	0.000		0.000		0.000		-		0.000	0.000	100.725	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604234N / *Advanced Hawkeye*	Project (Number/Name) 3051 / *E-2D Adv Hawkeye*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	291.584	70.900		89.193		73.610		-		73.610	181.661	706.948	N/A

Remarks

Totals may not add due to rounding.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental T&E	WR	NAWCAD : Pax River, MD	139.584	55.006	Nov 2016	50.376	Nov 2017	40.366	Nov 2018	-		40.366	353.114	638.446	-
Developmental T&E	Various	Various : Various	36.280	0.100	Oct 2016	0.100	Oct 2017	0.100	Nov 2018	-		0.100	0.600	37.180	-
Developmental T&E - ROR	SS/CPFF	Northrop Grumman Corporation(NGC) : Melbourne, FL	3.000	4.272	May 2017	5.980	Nov 2017	4.779	Nov 2018	-		4.779	21.088	39.119	39.119
Developmental T&E ETS	Various	Various : Various	12.554	0.000		0.000		0.000		-		0.000	0.000	12.554	12.554
Developmental T&E ETS	C/CPFF	JFTaylor Inc. : Lexington Park, MD	9.808	1.361	Feb 2017	1.703	Feb 2018	1.618	Feb 2019	-		1.618	14.047	28.537	28.537
Operational T&E	WR	NAWCAD : Pax River, MD	23.849	0.924	Nov 2016	2.801	Nov 2017	1.502	Nov 2018	-		1.502	1.650	30.726	-
Operational T&E	Various	Various : Various	7.775	2.706	Nov 2016	1.013	Nov 2017	6.483	Nov 2018	-		6.483	79.400	97.377	-
Test Assets	Various	Various : Various	5.192	1.409	Nov 2016	12.783	Nov 2017	1.131	Nov 2018	-		1.131	7.257	27.772	-
Prior Year T&E costs no longer funded in FYDP	Various	Various : Various	61.440	0.000		0.000		0.000		-		0.000	0.000	61.440	-
		Subtotal	299.482	65.778		74.756		55.979		-		55.979	477.156	973.151	N/A

Remarks

Totals may not add due to rounding.
Developmental Test & Evaluation (T&E), Developmental T&E (Engineering & Technical Services) and Operational T&E - various contractors and award dates throughout the fiscal year.
Operational T&E requirement increase from FY18 to FY19 due to DSSC 3 OT planned for FY19.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604234N / *Advanced Hawkeye*	Project (Number/Name) 3051 / *E-2D Adv Hawkeye*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	Various : Various	2.891	0.198	Oct 2016	0.350	Oct 2017	0.404	Oct 2018	-		0.404	1.761	5.604	-
Program Mgmt Supt	Various	Vsrious : Various	0.094	0.000		0.000		0.000		-		0.000	0.000	0.094	-
Prior Year Mgmt costs no longer funded in FYDP	Various	Various : Various	66.614	0.000		0.000		0.000		-		0.000	0.000	66.614	-
		Subtotal	69.599	0.198		0.350		0.404		-		0.404	1.761	72.312	N/A

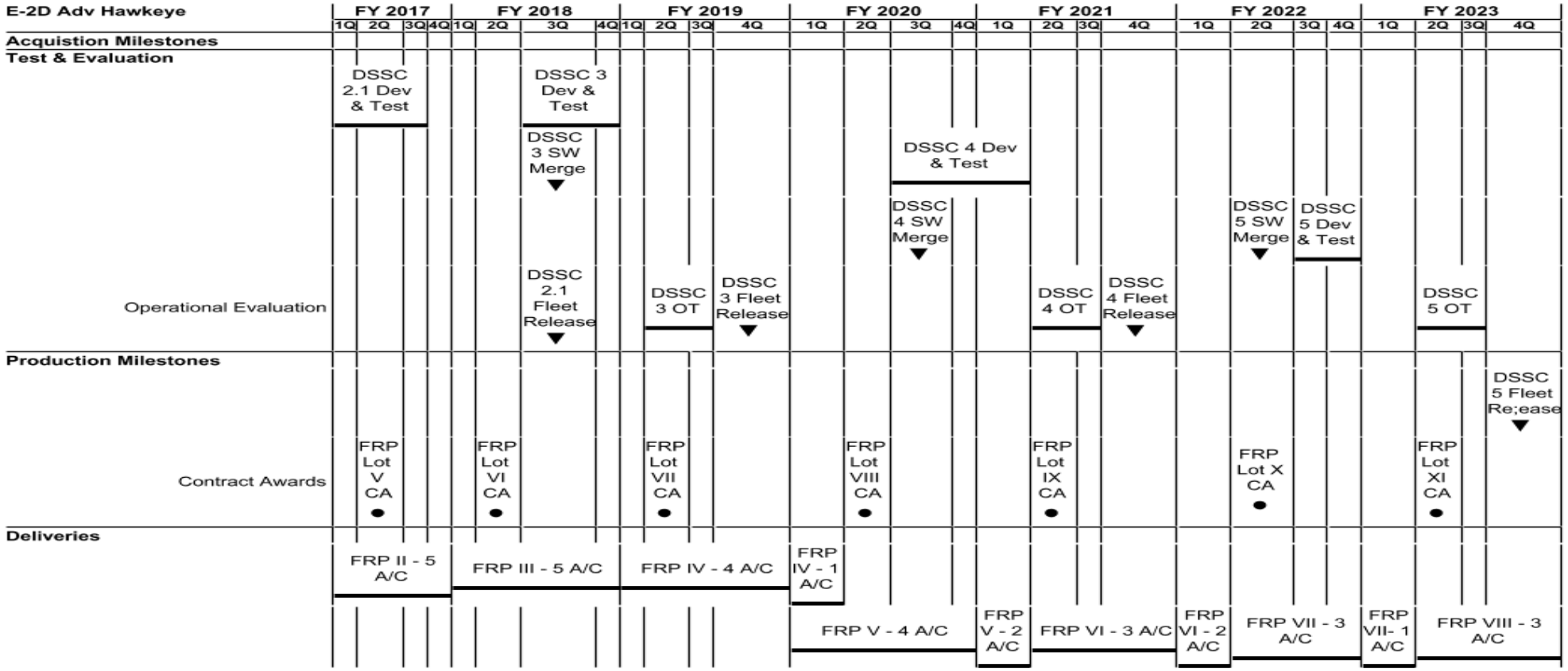
Remarks

Totals may not add due to rounding.
Contractor Engineering Support, Government Engineering Support, Program Support and Travel - various contractors and/or award dates throughout fiscal year.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4,589.834	344.718		292.535		223.565		-		223.565	1,447.731	6,898.383	N/A

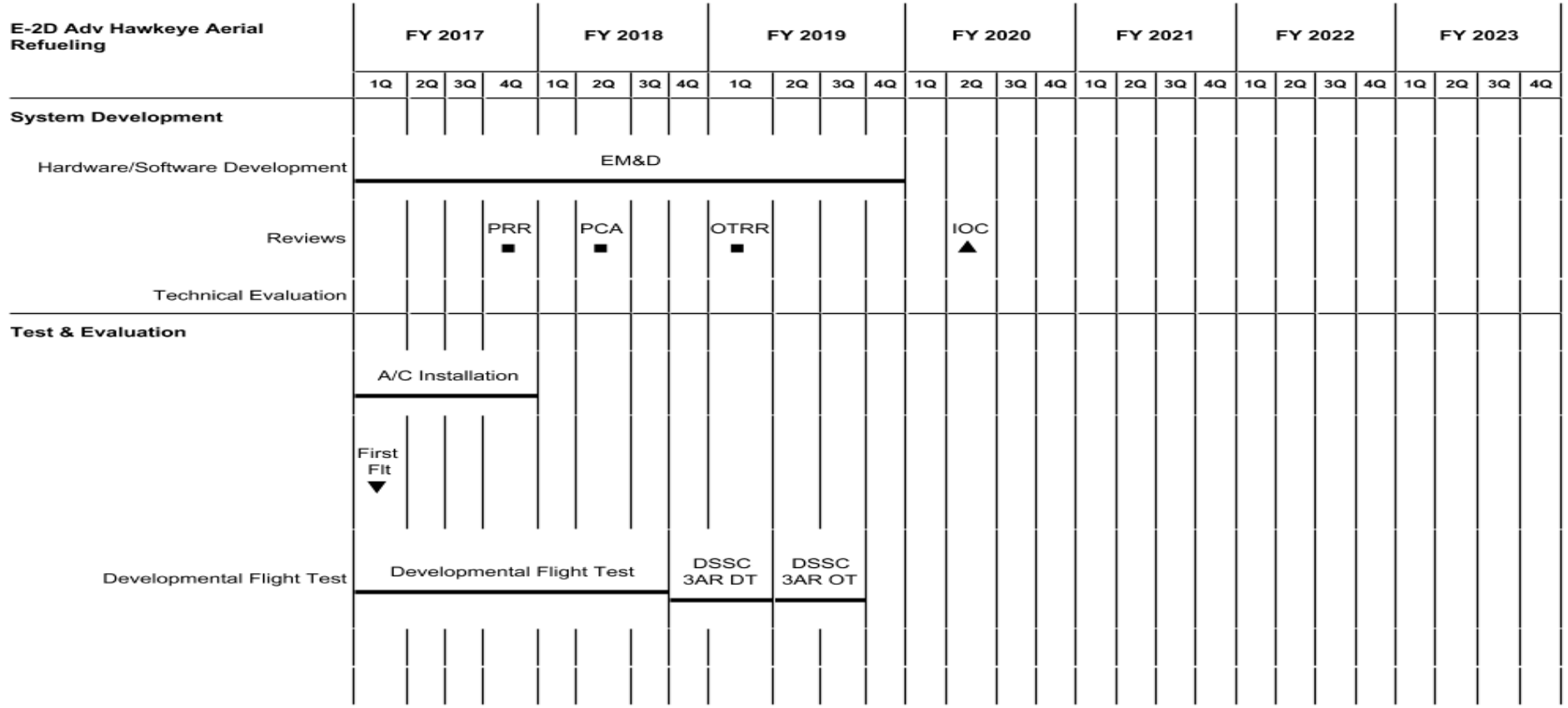
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



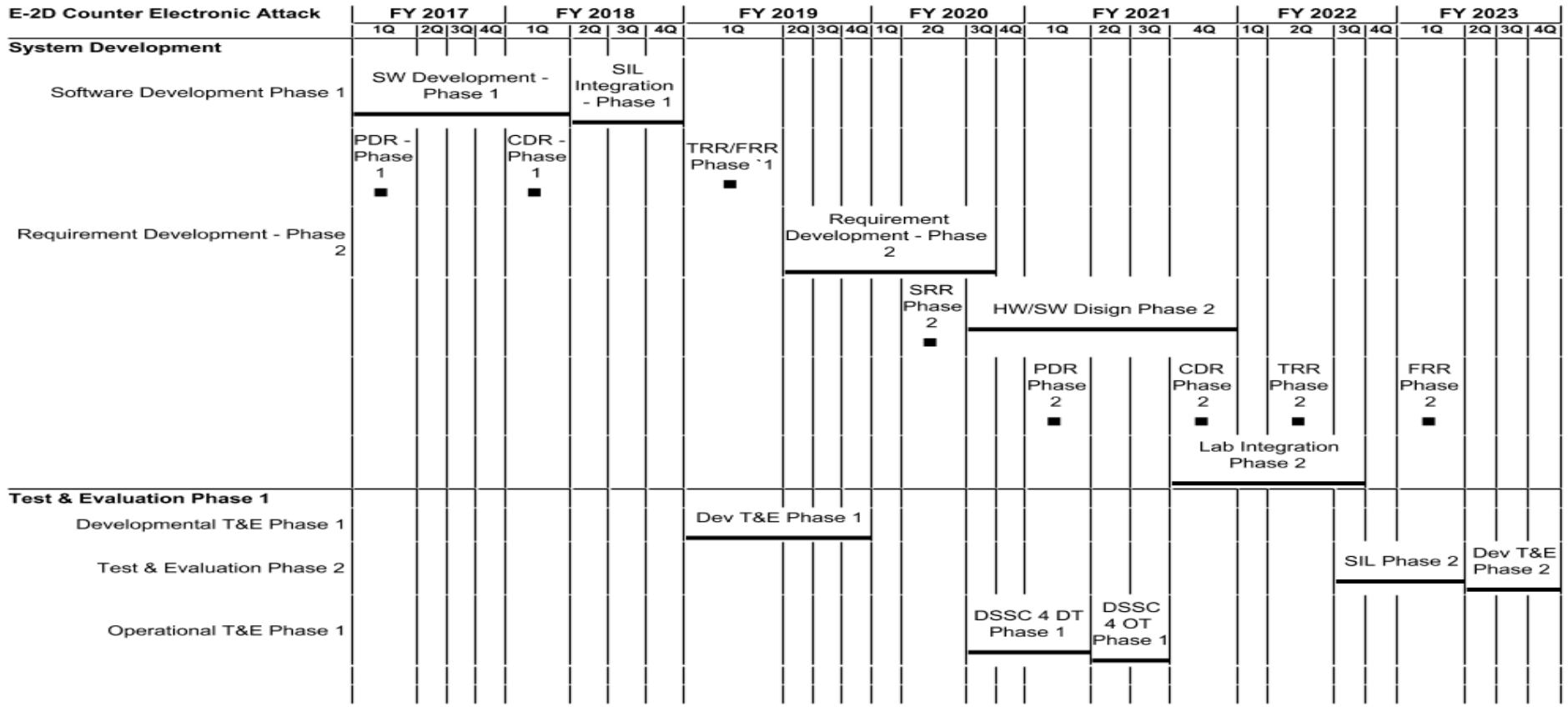
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



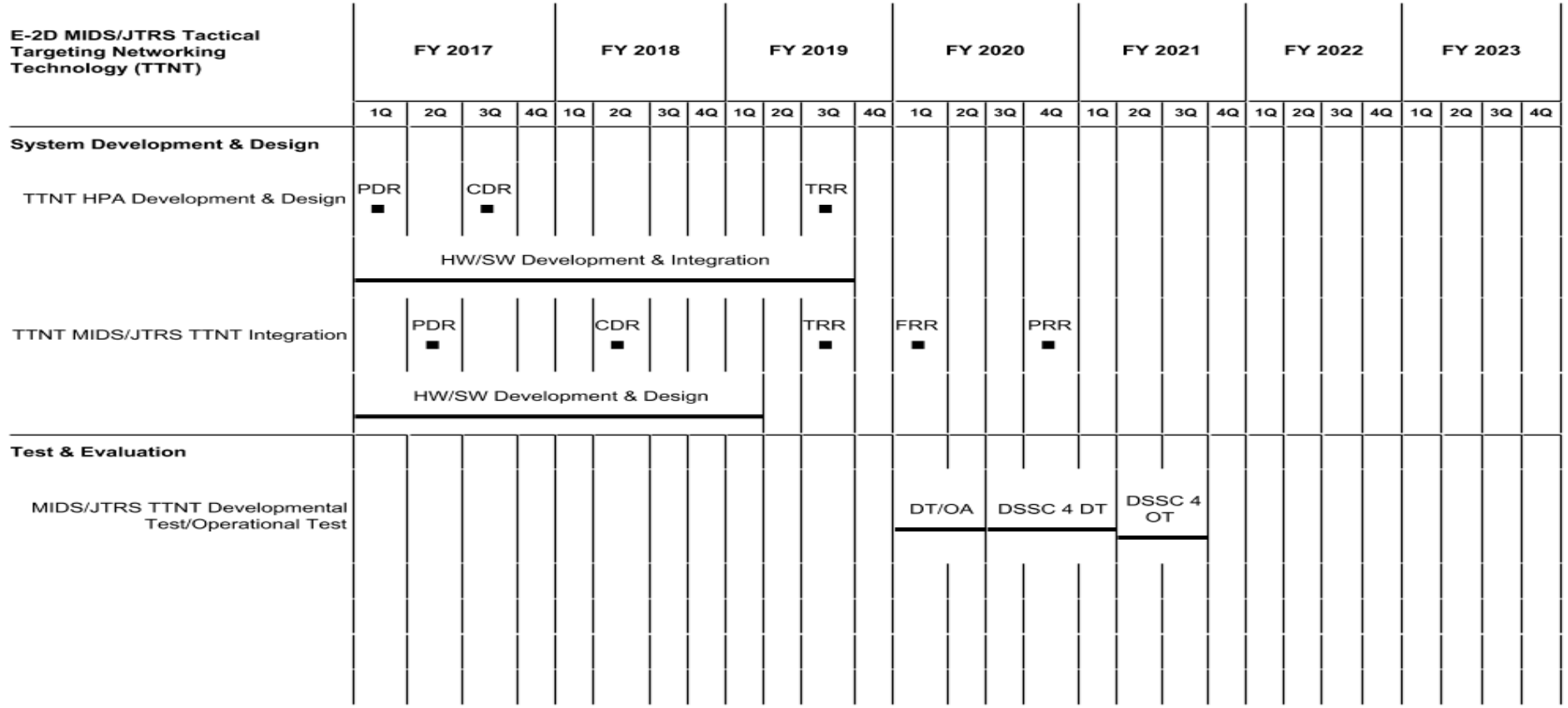
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



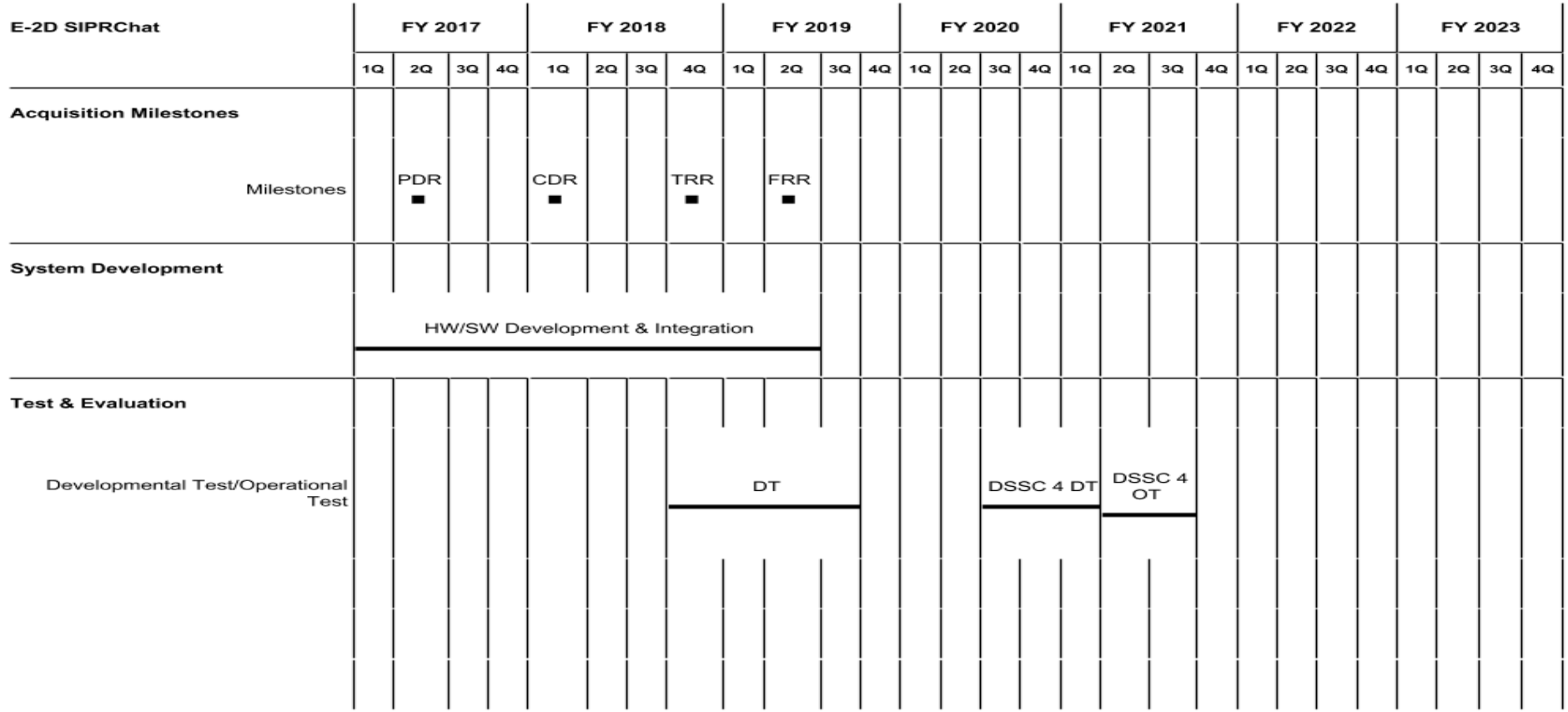
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



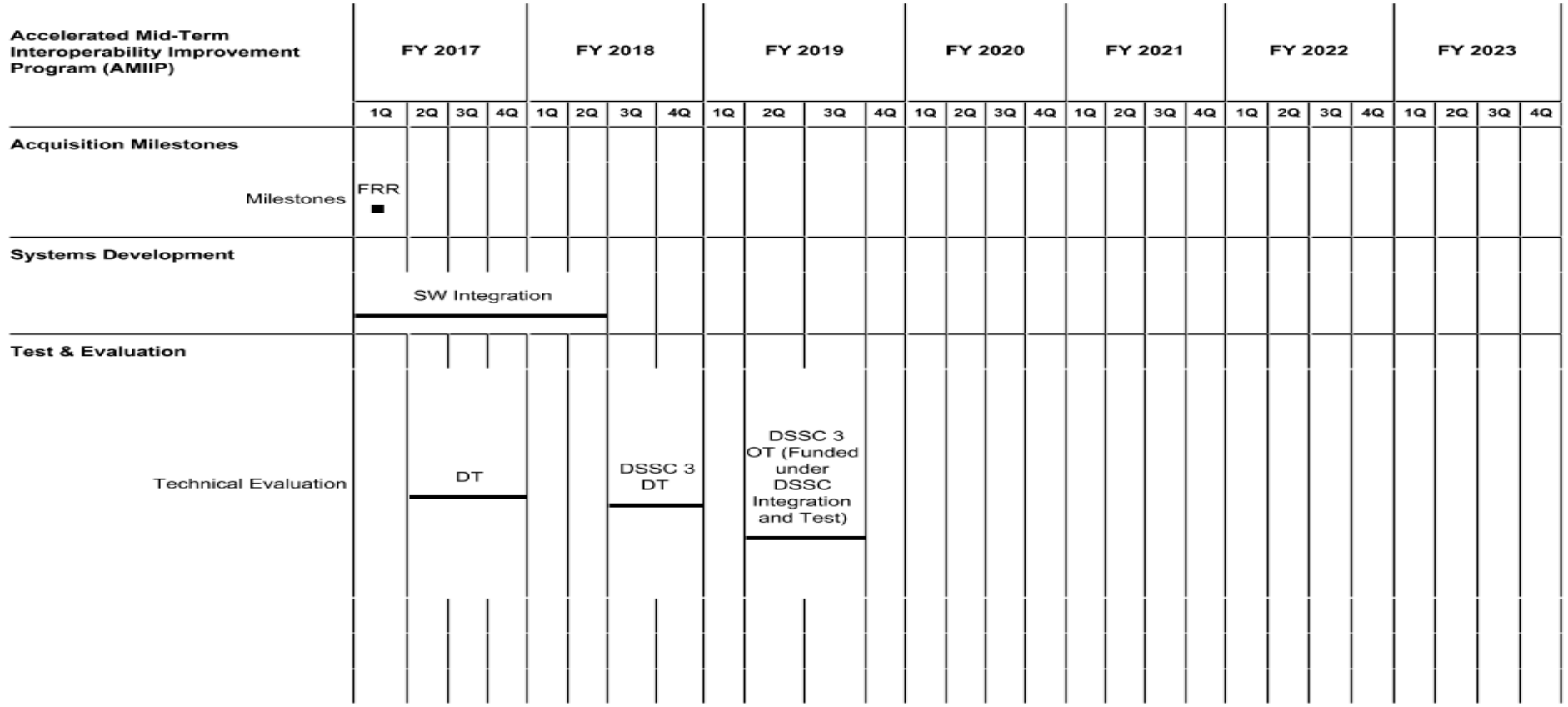
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



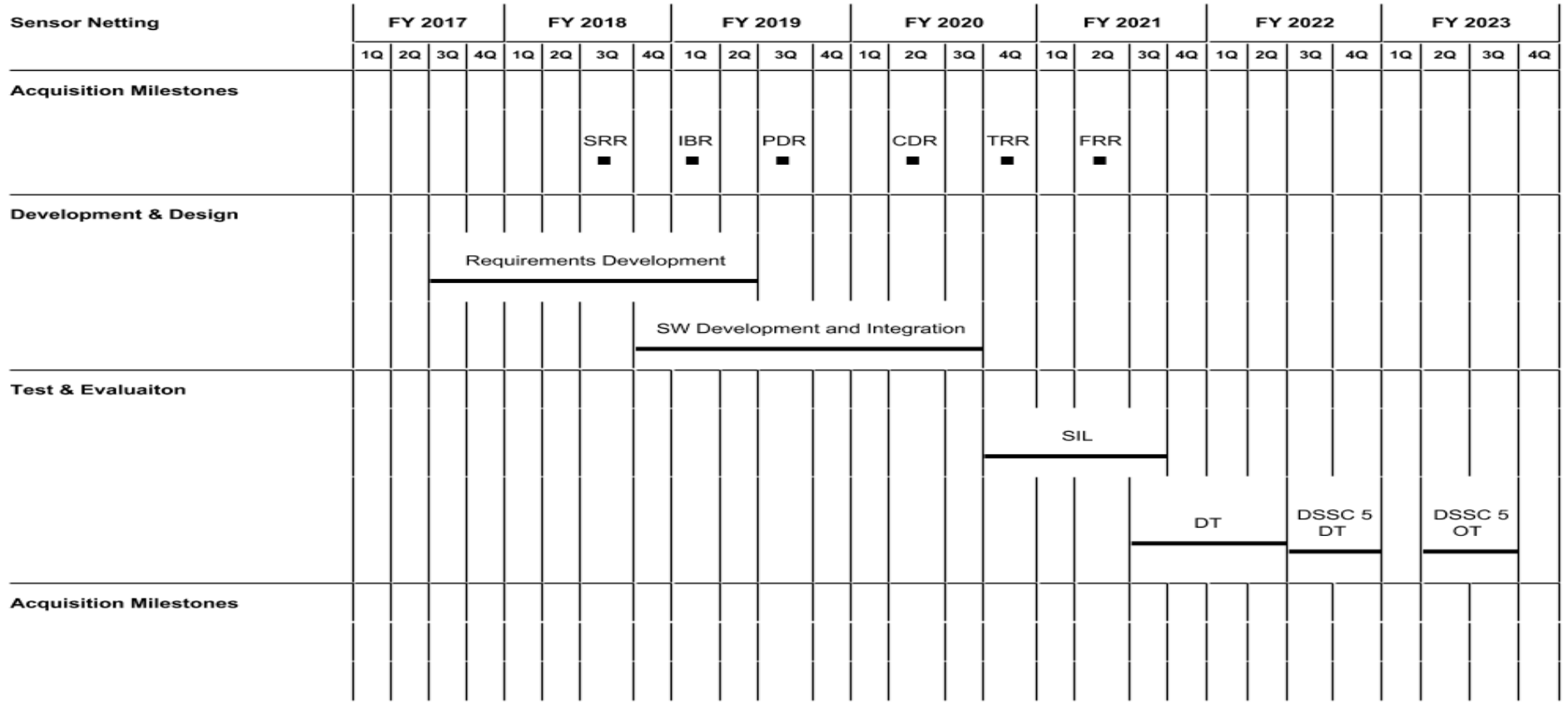
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



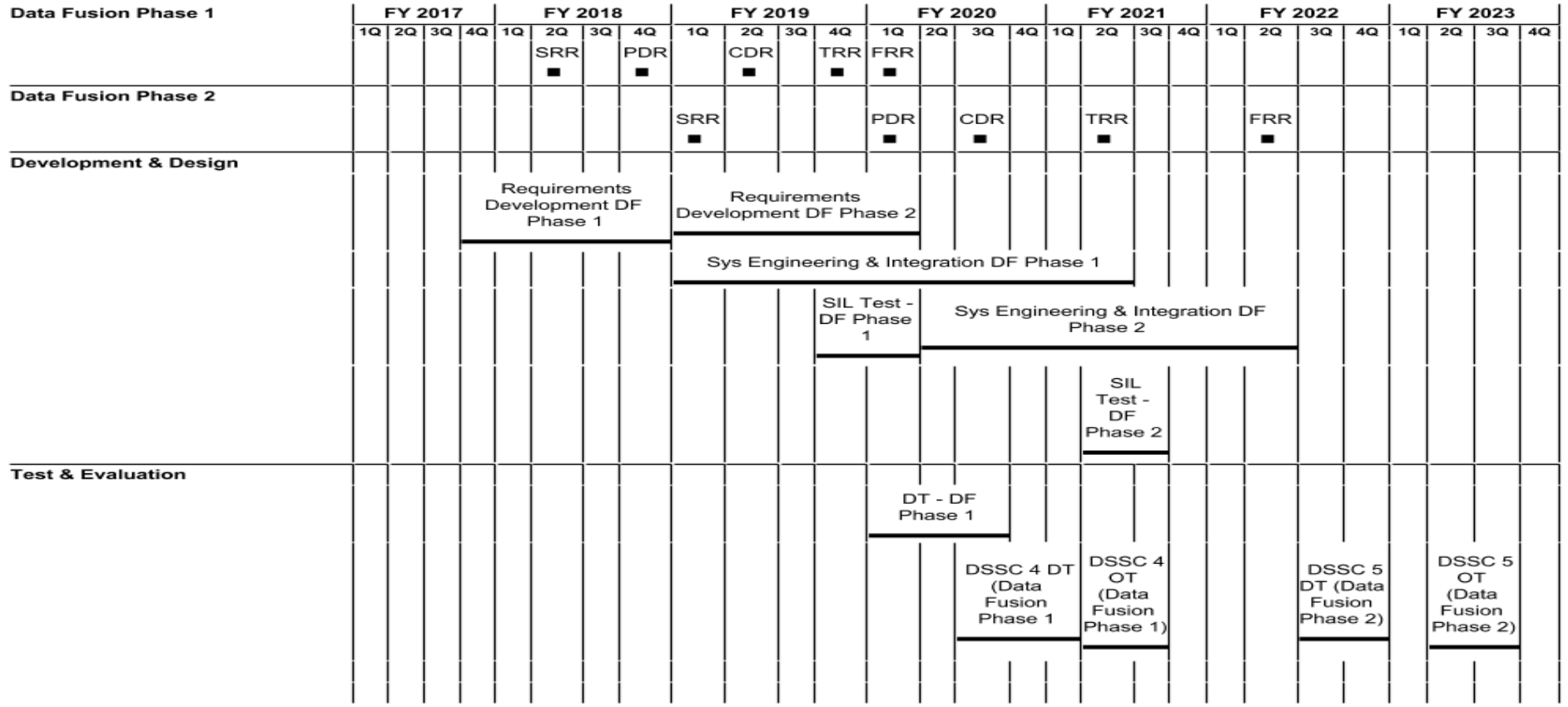
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



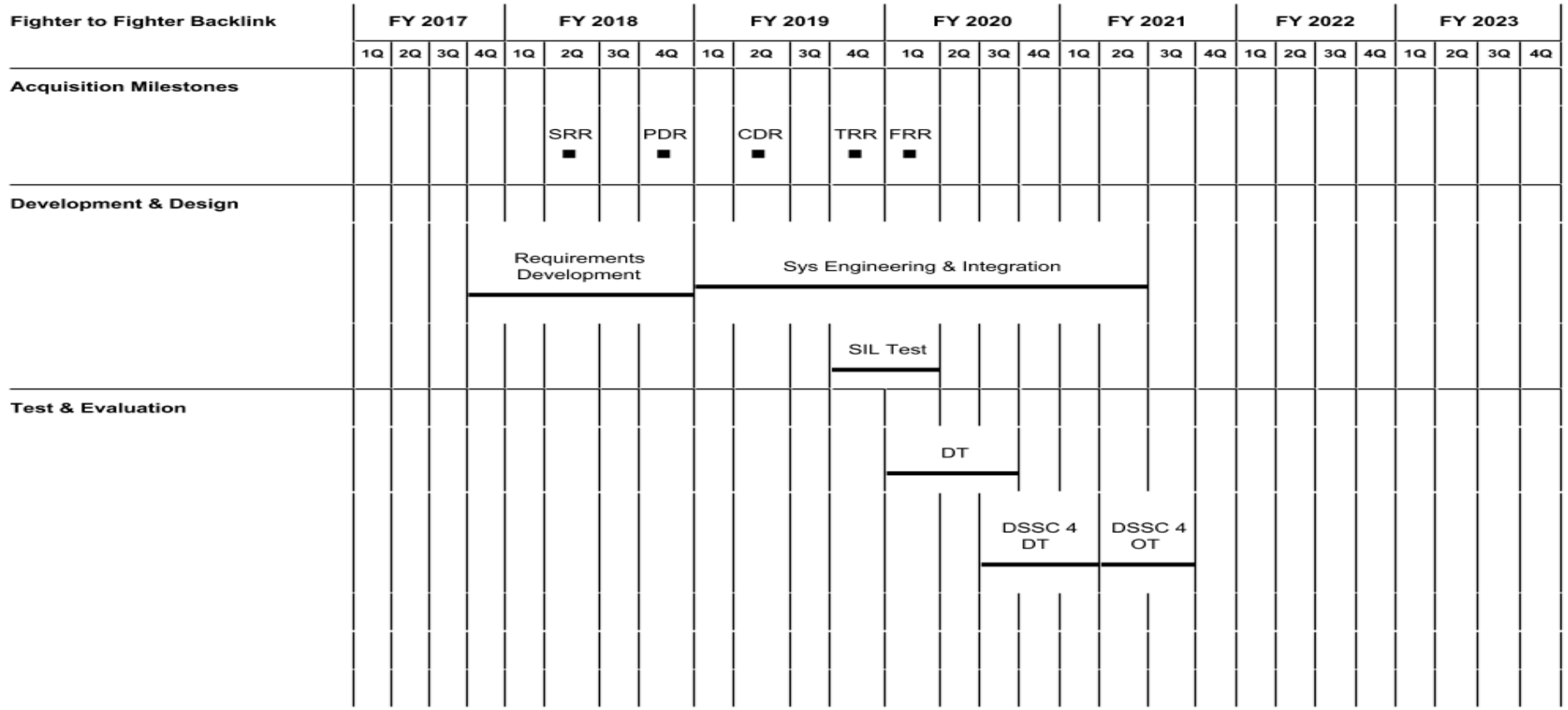
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



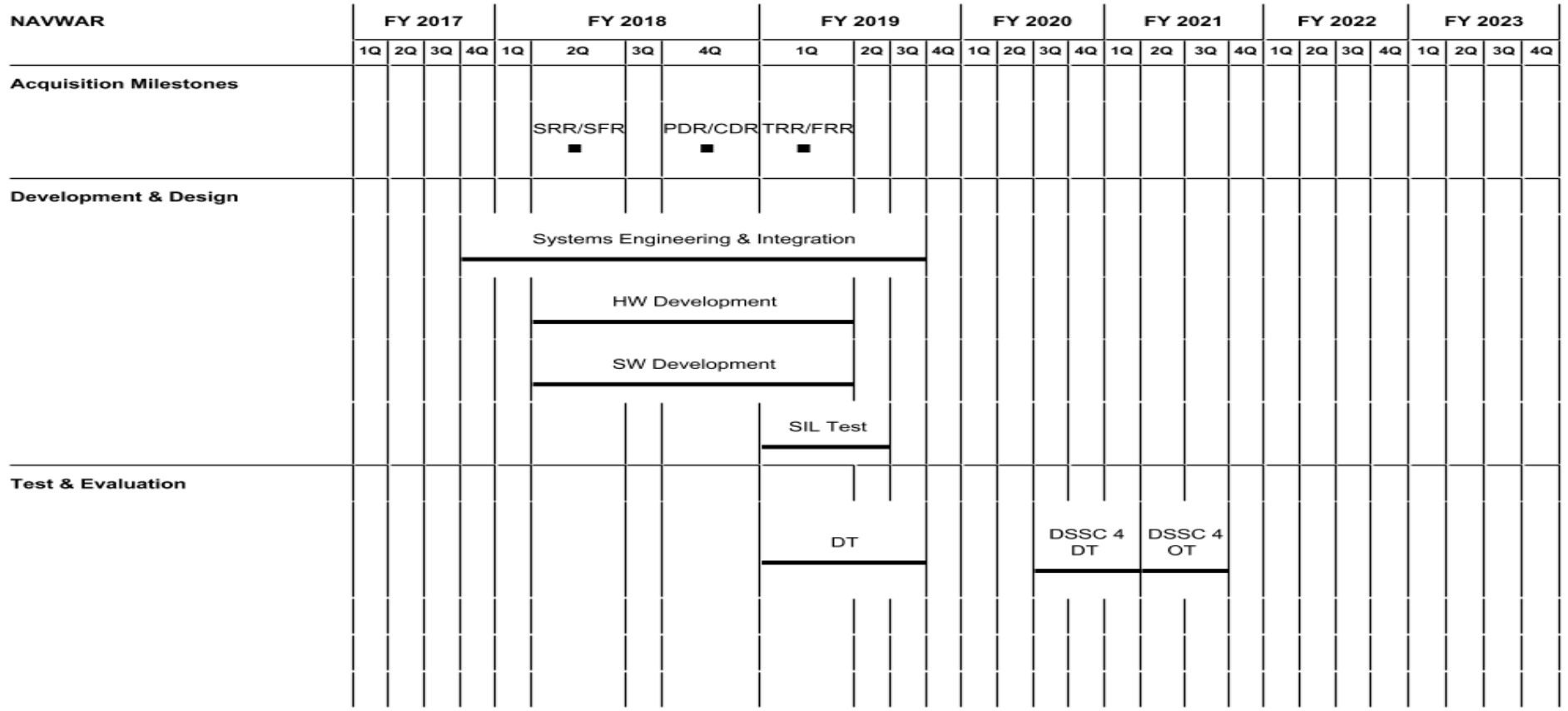
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



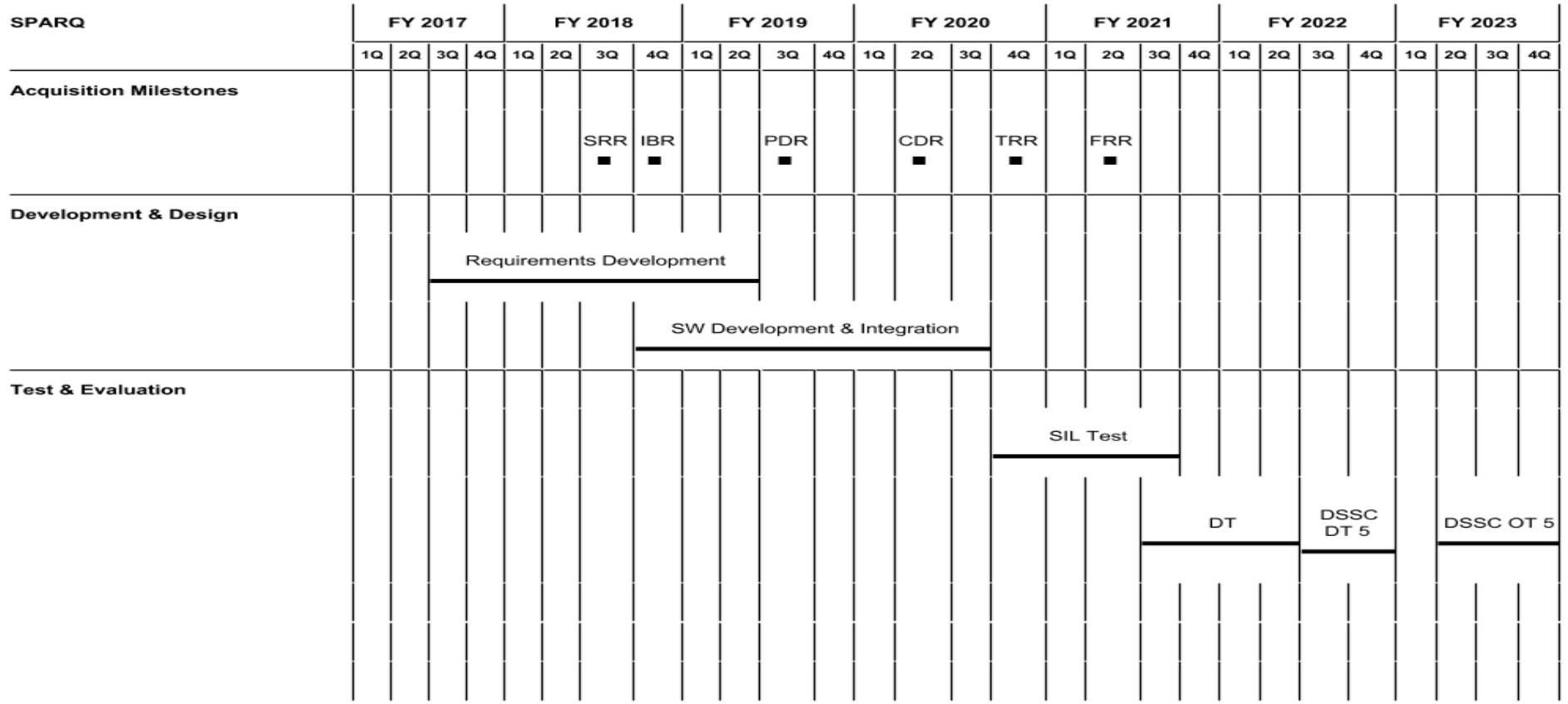
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



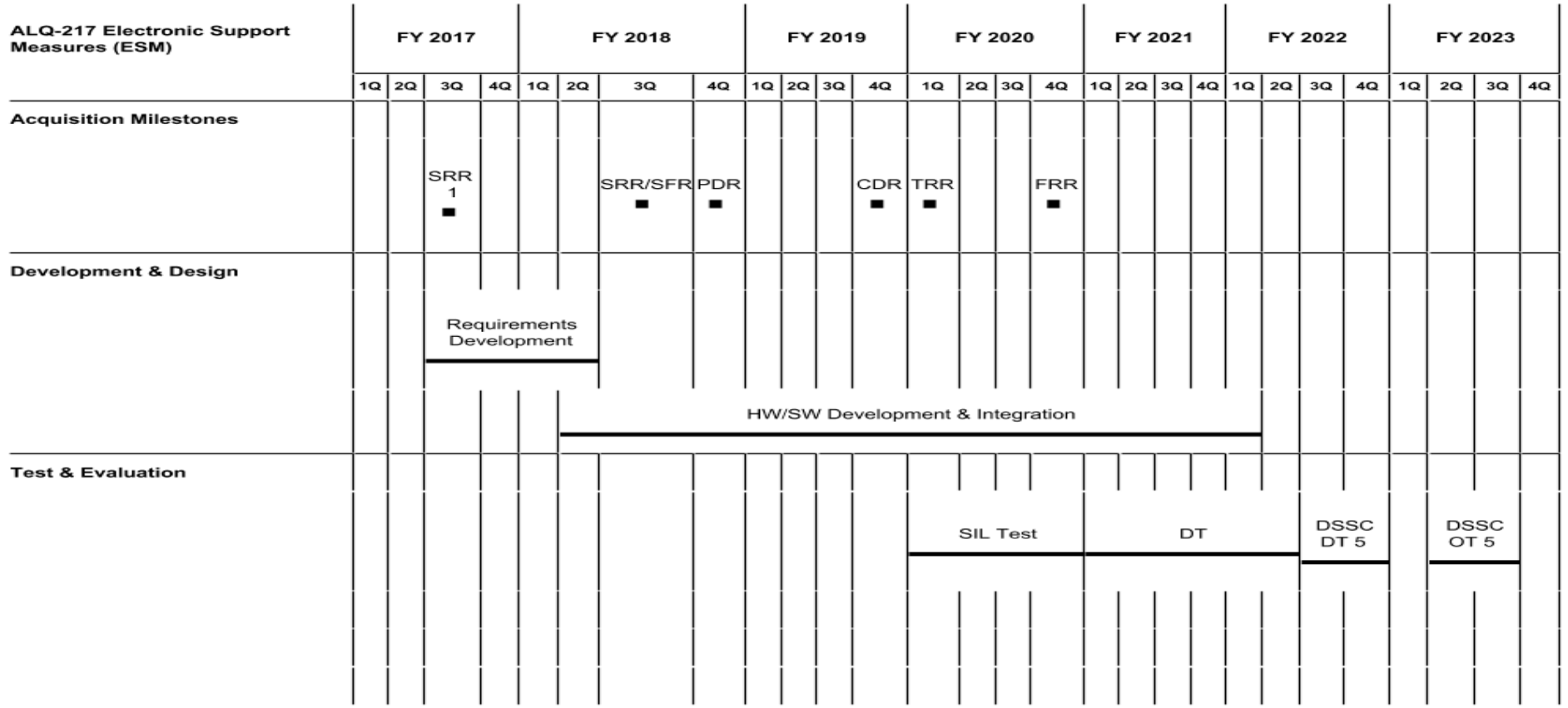
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



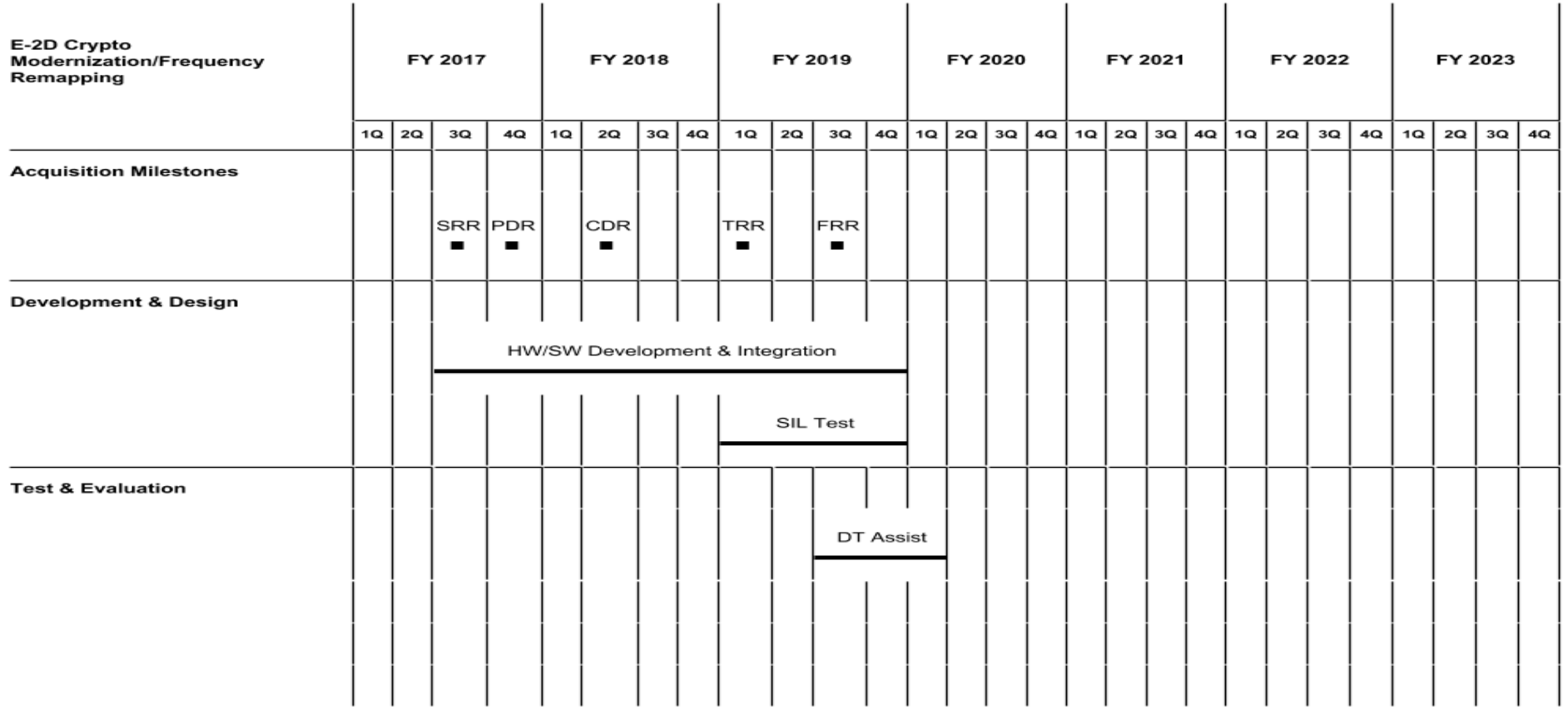
2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



2019PB - 0604234N - 3051

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*



2019PB - 0604234N - 3051

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
E-2D Adv Hawkeye				
Test & Evaluation: DSSC 2.1 Capability Dev & Testing	1	2017	3	2017
Test & Evaluation: DSSC 3 Capability Dev & Testing	3	2018	4	2018
Test & Evaluation: Software Merge - DSSC 3	3	2018	3	2018
Test & Evaluation: DSSC 4 Capability Dev & Testing	3	2020	1	2021
Test & Evaluation: Software Merge DSSC 4	3	2020	3	2020
Test & Evaluation: DSSC 5 Capability Dev & Testing	3	2022	4	2022
Test & Evaluation: Software Merge DSSC 5	2	2022	2	2022
Test & Evaluation: Operational Evaluation: DSSC 2.1 Fleet Release	3	2018	3	2018
Test & Evaluation: Operational Evaluation: DSSC 3 Operational Test	2	2019	3	2019
Test & Evaluation: Operational Evaluation: DSSC 3 Fleeet Release	4	2019	4	2019
Test & Evaluation: Operational Evaluation: DSSC 4 Operational Test	2	2021	3	2021
Test & Evaluation: Operational Evaluation: DSSC 4 Fleet Release	4	2021	4	2021
Test & Evaluation: Operational Evaluation: DSSC 5 Operational Test	2	2023	3	2023
Production Milestones: DSSC 5 Fleet Release	4	2023	4	2023
Production Milestones: Contract Awards: Production Milestones - FRP Lot V CA	2	2017	2	2017
Production Milestones: Contract Awards: Production Milestones - FRP Lot VI CA	2	2018	2	2018
Production Milestones: Contract Awards: Production Milestones - FRP Lot VII CA	2	2019	2	2019
Production Milestones: Contract Awards: Production Milestones - FRP Lot VIII CA	2	2020	2	2020
Production Milestones: Contract Awards: Production Milestones - FRP Lot IX CA	2	2021	2	2021
Production Milestones: Contract Awards: Production Milestones - FRP Lot X CA	2	2022	2	2022
Production Milestones: Contract Awards: Production Milestones - FRP Lot XI CA	2	2023	2	2023
Deliveries: Production Deliveries - FRP II (5 A/C)	1	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: Production Deliveries - FRP III (5 A/C)	1	2018	4	2018
Deliveries: Production Deliveries - FRP IV (4 A/C)	1	2019	4	2019
Deliveries: Production Deliveries - FRP IV (1 A/C)	1	2020	1	2020
Deliveries: Production Deliveries - FRP V (4 A/C)	1	2020	4	2020
Deliveries: Production Deliveries - FRP V (2 A/C)	1	2021	1	2021
Deliveries: Production Deliveries - FRP VI (3 A/C)	2	2021	4	2021
Deliveries: Production Deliveries - FRP VI (2 A/C)	1	2022	1	2022
Deliveries: Production Deliveries - FRP VII (3 A/C)	2	2022	4	2022
Deliveries: Production Deliveries - FRP VII (1 A/C)	1	2023	1	2023
Deliveries: Production Deliveries - FRP VIII (3 A/C)	2	2023	4	2023
E-2D Adv Hawkeye Aerial Refueling				
System Development: Hardware/Software Development: Aerial Refueling - Engineering & Manufacturing Development	1	2017	4	2019
System Development: Reviews: Aerial Refueling - Production Readiness Review	4	2017	4	2017
System Development: Reviews: Aerial Refueling - Physical Configuration Audit	2	2018	2	2018
System Development: Reviews: Aerial Refueling - Operational Test Readiness Review	1	2019	1	2019
System Development: Reviews: Aerial Refueling - Initial Operational Capability	2	2020	2	2020
Test & Evaluation: Aerial Refueling - Aircraft Installation	1	2017	4	2017
Test & Evaluation: Aerial Refueling - First Flight	1	2017	1	2017
Test & Evaluation: Developmental Flight Test: Developmental Flight Test	1	2017	3	2018
Test & Evaluation: Developmental Flight Test: Developmental Test	4	2018	1	2019
Test & Evaluation: Developmental Flight Test: Opertational Flight Test	2	2019	3	2019
E-2D Counter Electronic Attack				
System Development: Software Development Phase 1: Counter Electronic Attack - SW Development	1	2017	1	2018
System Development: Software Development Phase 1: Counter Electronic Attack - SIL Integration	2	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: Software Development Phase 1: Counter Electronic Attack - Preliminary Design Review	1	2017	1	2017
System Development: Software Development Phase 1: Counter Electronic Attack - Critcial Design Review	1	2018	1	2018
System Development: Software Development Phase 1: Counter Electronic Attack - TRR/FRR	1	2019	1	2019
System Development: Requirement Development - Phase 2: Counter Electronic Attack - Requirement Development	2	2019	3	2020
System Development: Requirement Development - Phase 2: Counter Electronic Attack - HW/SW Design	3	2020	4	2021
System Development: Requirement Development - Phase 2: Counter Electronic Attack - System Requirement Review	2	2020	2	2020
System Development: Requirement Development - Phase 2: Counter Electronic Attack - Preliminary Review	1	2021	1	2021
System Development: Requirement Development - Phase 2: Counter Electronic Attack - Critical Design Review	4	2021	4	2021
System Development: Requirement Development - Phase 2: Counter Electronic Attack - Test Readiness Review	2	2022	2	2022
System Development: Requirement Development - Phase 2: Counter Electronic Attack - Functional Readiness Review	1	2023	1	2023
System Development: Requirement Development - Phase 2: Counter Electronic Attack - Lab Integration	4	2021	3	2022
Test & Evaluation Phase 1: Developmental T&E Phase 1: Counter Electronic Attack - DT&E	1	2019	4	2019
Test & Evaluation Phase 1: Test & Evaluation Phase 2: Counter Electronic Attack - SIL	3	2022	1	2023
Test & Evaluation Phase 1: Test & Evaluation Phase 2: Counter Electronic Attack - DT&E	2	2023	4	2023
Test & Evaluation Phase 1: Operational T&E Phase 1: Developmental Test	3	2020	1	2021
Test & Evaluation Phase 1: Operational T&E Phase 1: Operational Test	2	2021	3	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
E-2D MIDS/JTRS Tactical Targeting Networking Technology (TTNT)				
System Development & Design: TTNT HPA Development & Design: TTNT High Power Amplifier Preliminary Design Review	1	2017	1	2017
System Development & Design: TTNT HPA Development & Design: TTNT High Power Amplifier Critical Design Review	3	2017	3	2017
System Development & Design: TTNT HPA Development & Design: TTNT High Power Amplifier Test Readiness Review	3	2019	3	2019
System Development & Design: TTNT HPA Development & Design: System Development & Design	1	2017	3	2019
System Development & Design: TTNT MIDS/JTRS TTNT Integration: TTNT - Preliminary Design Review	2	2017	2	2017
System Development & Design: TTNT MIDS/JTRS TTNT Integration: TTNT - Critical Design Review	2	2018	2	2018
System Development & Design: TTNT MIDS/JTRS TTNT Integration: TTNT -Test Readiness Review	3	2019	3	2019
System Development & Design: TTNT MIDS/JTRS TTNT Integration: TTNT - Functional Readiness Review	1	2020	1	2020
System Development & Design: TTNT MIDS/JTRS TTNT Integration: TTNT - Production Readiness Review	4	2020	4	2020
System Development & Design: TTNT MIDS/JTRS TTNT Integration: System Development & Design	1	2017	1	2019
Test & Evaluation: MIDS/JTRS TTNT Developmental Test/Operational Test: MIDS/ JTRS/TTNT - Developmental Test	1	2020	2	2020
Test & Evaluation: MIDS/JTRS TTNT Developmental Test/Operational Test: MIDS/ JTRS/TTNT - Developmental Test DSSC 4	3	2020	1	2021
Test & Evaluation: MIDS/JTRS TTNT Developmental Test/Operational Test: MIDS/ JTRS/TTNT Operational Test DSSC 4	2	2021	3	2021
E-2D SIPRChat				
Acquisition Milestones: Milestones: SIPRChat - Preliminary Design Review	2	2017	2	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Milestones: SIPRChat - Critical Design Review	1	2018	1	2018
Acquisition Milestones: Milestones: SIPRChat -Test Readiness Review	4	2018	4	2018
Acquisition Milestones: Milestones: SIPRChat - Functional Readiness Review	2	2019	2	2019
System Development: Hardware & Software Integration	1	2017	2	2019
Test & Evaluation: Developmental Test/Operational Test: Developmental Test	4	2018	3	2019
Test & Evaluation: Developmental Test/Operational Test: Developmental Test DSSC 4	3	2020	1	2021
Test & Evaluation: Developmental Test/Operational Test: Operational Test	2	2021	3	2021
Accelerated Mid-Term Interoperability Improvement Program (AMIIP)				
Acquisition Milestones: Milestones: Fleet Readiness Review	1	2017	1	2017
Systems Development: Software Integration	1	2017	2	2018
Test & Evaluation: Technical Evaluation: Developmental Test	2	2017	4	2017
Test & Evaluation: Technical Evaluation: Developmental Test DSSC 3	3	2018	4	2018
Test & Evaluation: Technical Evaluation: Operational Test DSSC 3	2	2019	3	2019
Sensor Netting				
Acquisition Milestones: System Requirements Review	3	2018	3	2018
Acquisition Milestones: Integrated Baseline Review	1	2019	1	2019
Acquisition Milestones: Preliminary Design Review	3	2019	3	2019
Acquisition Milestones: Critical Design Review	2	2020	2	2020
Acquisition Milestones: Test Readiness Review	4	2020	4	2020
Acquisition Milestones: Functional Readiness Review	2	2021	2	2021
Development & Design: Requirement Development	3	2017	2	2019
Development & Design: Software Development and Integration	4	2018	3	2020
Test & Evaluaiton: SIL Test	4	2020	3	2021
Test & Evaluaiton: Development Test	3	2021	2	2022
Test & Evaluaiton: Development Test DSSC 5	3	2022	4	2022
Test & Evaluaiton: Operation Test DSSC 5	2	2023	3	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Data Fusion Phase 1				
System Requirements Review	2	2018	2	2018
Preliminary Design Review	4	2018	4	2018
Critical Design Review	2	2019	2	2019
Test Readiness Review	4	2019	4	2019
Functional Readiness Review	1	2020	1	2020
Data Fusion Phase 2: System Requirement Review	1	2019	1	2019
Data Fusion Phase 2: Preliminary Design Review	1	2020	1	2020
Data Fusion Phase 2: Critical Design Review	3	2020	3	2020
Data Fusion Phase 2: Test Readiness Review	2	2021	2	2021
Data Fusion Phase 2: Functional Readiness Review	2	2022	2	2022
Development & Design: Development & Integration Data Fusion Phase 1	4	2017	4	2018
Development & Design: Development & Integration Data Fusion Phase 2	1	2019	1	2020
Development & Design: Systems Engineering & Integration Data Fusion Phase 1	1	2019	2	2021
Development & Design: System Engineering & Integration Data Fusion Phase 2	2	2020	2	2022
Development & Design: SIL Test Data Fusion Phase 1	4	2019	1	2020
Development & Design: SIL Test Data Fusion Phase 2	2	2021	3	2021
Test & Evaluation: Developmental Test - Data Fusion Phase 1	1	2020	3	2020
Test & Evaluation: Developmental Test - Data Fusion Phase 2	3	2021	1	2022
Test & Evaluation: Developmental Test DSSC 4 (Data Fusion Phase 1)	3	2020	1	2021
Test & Evaluation: Operational Test DSSC 4 (Data Fusion Phase 1)	2	2021	3	2021
Test & Evaluation: Developmental Test DSSC 5 (Data Fusion Phase 2)	3	2022	4	2022
Test & Evaluation: Operational Test DSSC 5 (Data Fusion Phase 2)	2	2023	3	2023
Fighter to Fighter Backlink				
Acquisition Milestones: System Requirements Review	2	2018	2	2018
Acquisition Milestones: Preliminary Design Review	4	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Critical Design Review	2	2019	2	2019
Acquisition Milestones: Test Readiness Review	4	2019	4	2019
Acquisition Milestones: Functional Readiness Review	1	2020	1	2020
Development & Design: Development & Integration	4	2017	4	2018
Development & Design: Systems Engineering & Integration	1	2019	2	2021
Development & Design: SIL Test	4	2019	1	2020
Test & Evaluation: Developmental Test	1	2020	3	2020
Test & Evaluation: Developmental Test DSSC 4	3	2020	1	2021
Test & Evaluation: Operational Test DSSC 4	2	2021	3	2021
NAVWAR				
Acquisition Milestones: System Rquirements Review/System Functional Review	2	2018	2	2018
Acquisition Milestones: Preliminary Design Review/Critical Design Review	4	2018	4	2018
Acquisition Milestones: Test Readiness Reivew/Functional Readiness Review	1	2019	1	2019
Development & Design: Systems Engineering & Integration	4	2017	3	2019
Development & Design: Hardware Development	2	2018	1	2019
Development & Design: Software Development	2	2018	1	2019
Development & Design: System Integration Lab Test	1	2019	2	2019
Test & Evaluation: Developmental Test	1	2019	3	2019
Test & Evaluation: Developmental Test DSSC 4	3	2020	1	2021
Test & Evaluation: Operational Testing DSSC 4	2	2021	3	2021
SPARQ				
Acquisition Milestones: System Requirements Review	3	2018	3	2018
Acquisition Milestones: Integrated Baseline Review	4	2018	4	2018
Acquisition Milestones: Preliminary Design Review	3	2019	3	2019
Acquisition Milestones: Critical Design Review	2	2020	2	2020
Acquisition Milestones: Test Readiness Review	4	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Functional Readiness Review	2	2021	2	2021
Development & Design: Requirement Development	3	2017	2	2019
Development & Design: Software Development and Integration	4	2018	3	2020
Test & Evaluation: SIL Test	4	2020	3	2021
Test & Evaluation: Developmental Test	3	2021	2	2022
Test & Evaluation: Developmental Test DSSC 5	3	2022	4	2022
Test & Evaluation: Operational Test DSSC 5	2	2023	4	2023
ALQ-217 Electronic Support Measures (ESM)				
Acquisition Milestones: System Requirements Review 1	3	2017	3	2017
Acquisition Milestones: System Requirements Review 2/System Functional Review	3	2018	3	2018
Acquisition Milestones: Preliminary Design Review	4	2018	4	2018
Acquisition Milestones: Critical Design Review	4	2019	4	2019
Acquisition Milestones: Test Readiness Review	1	2020	1	2020
Acquisition Milestones: Functional Readiness Review	4	2020	4	2020
Development & Design: Requirements Development	3	2017	2	2018
Development & Design: HW/SW Development & Integration	2	2018	1	2022
Test & Evaluation: SIL Test	1	2020	4	2020
Test & Evaluation: Developmental Test	1	2021	2	2022
Test & Evaluation: Developmental Test DSSC 5	3	2022	4	2022
Test & Evaluation: Operational Test DSSC 5	2	2023	3	2023
E-2D Crypto Modernization/Frequency Remapping				
Acquisition Milestones: Critical Design Review	2	2018	2	2018
Acquisition Milestones: System Requirements Review	3	2017	3	2017
Acquisition Milestones: Preliminary Design Review	4	2017	4	2017
Acquisition Milestones: Test Readiness Review	1	2019	1	2019
Acquisition Milestones: Functional Readiness Review	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 3051 / *E-2D Adv Hawkeye*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Development & Design: Hdw/SW Development & Integration	3	2017	4	2019
Development & Design: SIL Test	1	2019	4	2019
Test & Evaluation: Developmental Test	3	2019	1	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604234N / *Advanced Hawkeye*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	8.207	9.672	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.879
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Congressional Add. Program Increase for E-2D Advanced Hawkeye(AHE) radar development

A. Mission Description and Budget Item Justification

Congressional Add. Program increase for E-2D Advanced Hawkeye (AHE) radar development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Adv Radar Innovation Fund - Air (Cong)	9.672	0.000
FY 2017 Accomplishments: N/A		
FY 2018 Plans: N/A		
Congressional Adds Subtotals	9.672	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not required for Congressional Add.

E. Performance Metrics

Not required for Congressional Add.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604234N / *Advanced Hawkeye*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	C/FFP	Northrop Grumman Corporation (NGC) : Melbourne, FL	7.542	2.300	Oct 2017	0.000		0.000		-		0.000	0.000	9.842	7.542
System Engineering	Various	Various : Various	0.549	6.372	Dec 2017	0.000		0.000		-		0.000	0.000	6.921	0.549
		Subtotal	8.091	8.672		0.000		0.000		-		0.000	0.000	16.763	N/A

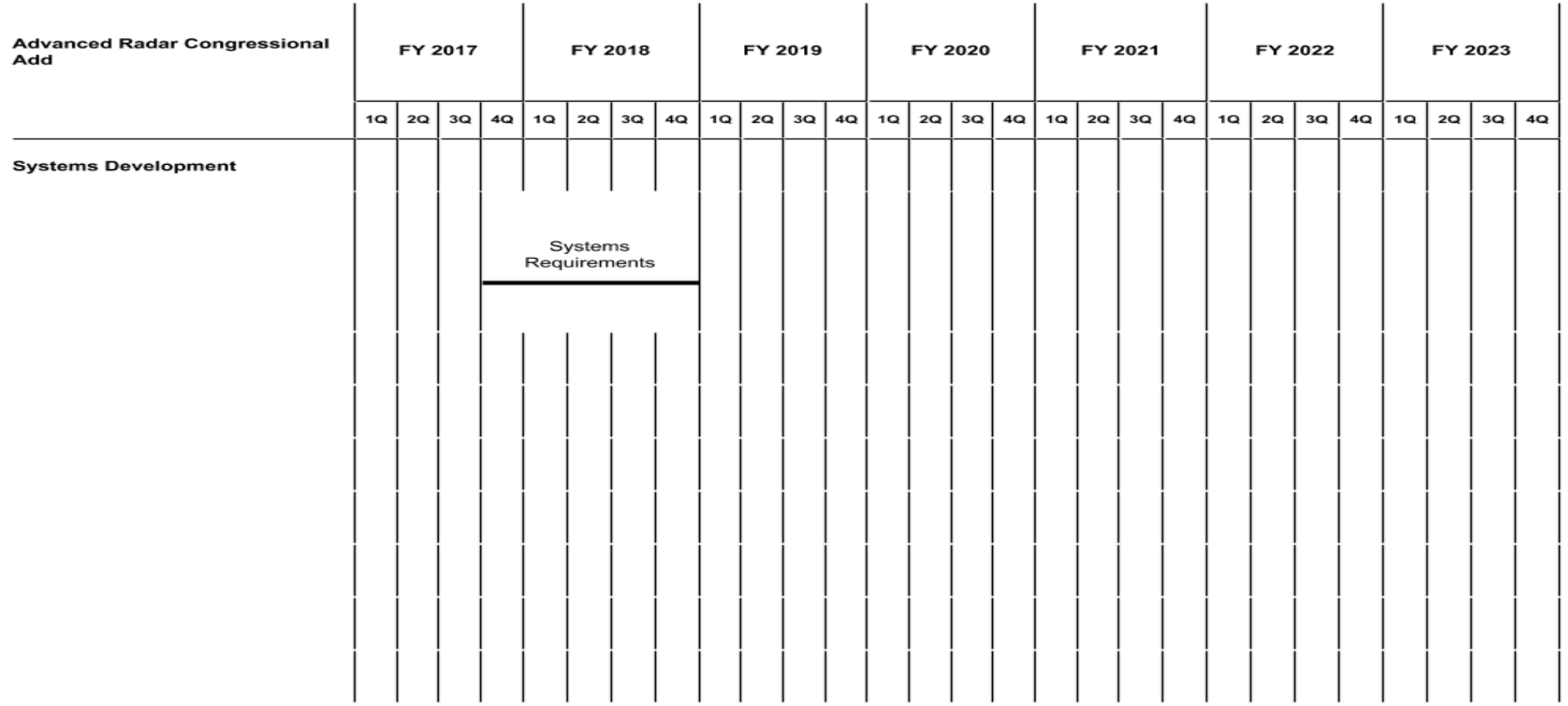
Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering	WR	SPAWAR : San Diego	0.116	0.000		0.000		0.000		-		0.000	0.000	0.116	-
Government Engineering	WR	NAWCAD : Pax River	0.000	1.000	Aug 2017	0.000		0.000		-		0.000	0.000	1.000	-
		Subtotal	0.116	1.000		0.000		0.000		-		0.000	0.000	1.116	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.207	9.672		0.000		0.000		-		0.000	0.000	17.879	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 9999 / *Congressional Adds*



2019PB - 0604234N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604234N / *Advanced Hawkeye*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Advanced Radar Congressional Add				
Systems Development: Systems Requirements	4	2017	4	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604245M / *H-1 Upgrades*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	0.000	58.097	-	58.097	75.951	73.660	57.362	38.824	Continuing	Continuing
3359: *H-1 Improvements*	0.000	0.000	0.000	58.097	-	58.097	75.951	73.660	57.362	38.824	Continuing	Continuing

A. Mission Description and Budget Item Justification

The mission of the AH-1 attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance, survivability enhancements, and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1 utility helicopter is to provide command and control and combat assault support under day/night and adverse weather conditions and special operations support; supporting arms coordination and aeromedical evacuation. Major modifications for both aircraft include 37 AH-1Ws converted to AH-1Zs, build 152 new AH-1Zs, remanufacture ten (10) H-1N helicopters and build 150 new UH-1Y models. AH-1Z and UH-1Y models include a 4-bladed, composite rotor system with semi-automatic bladefold, performance-matched transmissions, T700 Engine Digital Electronic Control Units, 4-bladed tail rotors and drive systems, more effective stabilizers, upgraded landing gear, and common, fully integrated cockpits and avionics systems. These upgrades add 10,000 flight hours to AH-1Z/UH-1Y airframes. The fully integrated cockpits reduce operator workload and improve situational awareness, thus increasing safety and reducing the rate of aircraft attrition. They provide considerable growth potential for future weapon systems and avionics to significantly increase mission effectiveness and survivability. The cockpits also include integration of onboard mission planning, communications, digital fire control, self-navigation, night navigation/targeting, air-to-ground missile and air-launched intercept missile weapon systems management in nearly identical crew stations, which significantly reduces training requirements. These upgrades maximize commonality between the two aircraft and provide needed improvements in crew and passenger survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

This budget is required for follow-on improvements to H-1 aircraft via integration of sensors and weapons, avionics, and air vehicle components that will address deficiencies, systems safety, obsolescence, readiness, reliability, supportability, and relevance in the battlespace. Improvements will include all associated System Configuration Set (SCS) updates as well as integration and testing related to the aircraft platforms.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	58.097	-	58.097
Total Adjustments	0.000	0.000	58.097	-	58.097
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	58.507	-	58.507

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604245M *I H-1 Upgrades*			
• Rate/Misc Adjustments	0.000	0.000	-0.410	-	-0.410

Change Summary Explanation

Funds increase from FY 2018 to FY 2019 due to transfer of effort from old PE 0604245N beginning in FY 2019.

The FY 2019 funding request was reduced by $1.300 million to account for the availability of prior year execution balances.

Technical: None

Schedule: System Configuration Sets (SCS) will be continuously developed and released in conjunction with required hardware obsolescence and capability improvements. Software development as a whole are accounted for separately on the R-3 and are apportioned into development efforts for Avionics and Sensors & Weapons on the R-2a. Software is no longer portrayed separately on the R-2a or R-4 since SCS builds are linked to the development of hardware. The Mission Description section for Avionics and Sensors and Weapons state that SCS is part of each of the projects.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604245M / *H-1 Upgrades*	Project (Number/Name) 3359 / *H-1 Improvements*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3359: *H-1 Improvements*	0.000	0.000	0.000	58.097	-	58.097	75.951	73.660	57.362	38.824	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of H-1 Improvements is to provide follow-on Research, Development, Test and Evaluation efforts in support of all H-1 aircraft.

Air Vehicle and Engine improvements include analysis of structural data to formulate Damage Limits and Tolerances for structural components to reduce life cycle costs and maintenance workload; and redesign of structural components and drive system components to minimize excessive and premature wear, increase reliability, and improve existing design deficiencies. Additional air vehicle upgrades include: redesign of the aircraft power-generating and electrical components (generators, inverters, wiring) to support power requirements for existing and future systems (Aircraft Survivability Equipment, emerging electronic warfare, and Degraded Visual Environment), redesign of the Environmental Control System /Thermal Redesign to support cooling of Technology Refresh Mission Computer and other avionics, redesign to add an auxiliary fuel capability, Intrepid Tiger, and upgrades the UH-1Y cabin floor panels.

Avionics improvements target digital inter-operability, integrated avionics, safety & survivability, and situational awareness for both the pilot and aircrew safety. This includes integrating Joint Battle Command-Platform (JBC-P), Full Motion Video (FMV), Degraded Visual Environment (DVE), Helmet Mounted Display improvements, cockpit displays, precision and GPS non-precision landing capability, Crash Survivable Flight Incident Recorder, collision avoidance, improved Embedded Global Positioning System (EGI), Inertial Navigation System (INS), targeting sensor systems and mission computer. H-1 capability improvements include improved Aircraft Survivability Equipment (ASE), digital operations & transfer of data, digital interoperability, digital video recording, video and data networking, and information integration with aviation combat elements and Marine Air Ground Task Force elements. Mandated capability efforts include - Communications, Navigation and Surveillance system/ Air Traffic Management (CNS/ATM), Required Navigation Performance/Area Navigation (RNP/RNAV), GPS Selective Availability Anti-Spoofing Module (SAASM), Automatic Dependent Surveillance - Broadcast (ADS-B), Crash Survivable Flight Incident Recorder, development efforts required for Depot standup and incorporation of technology and information protection/Information Assurance in critical avionics and sensor systems. In addition, the goal is to reduce total ownership cost for H-1 aircraft and related support systems by improving reliability and maintainability of critical flight and avionics systems along with associated peculiar avionics support equipment and incorporating fact-of-life obsolescence solutions. All avionics improvements include related System Configuration Set (SCS) development updates and testing.

Sensors, Weapons and Helmet Mounted Display System improvements include, manufacturing process improvements, hardware and software redesign to improve reliability, improve production methodologies, implement program security initiatives and increase the collective capability to address emerging battlefield threats. These improvements also address reliability and obsolescence, which collectively enhance Fleet readiness. The technical interface between the aircraft sensor, helmet and weapons is increasingly challenging to effectively employ advanced precision guided weapons and Aircraft Survivability Equipment (ASE) for the interface between the sensors, helmet and precision guided munitions. These systems require extensive software and hardware upgrades that translate into meaningful, sensor fusion based solutions, to provide both battlefield and situational awareness to the H1 platform. Specifically, the AN/ALQ-30 Target Sight System (TSS) will implement several block upgrade efforts with improvements to the IR Pointer, Laser and Cameras as well as adding capabilities such as Laser Spot Tracker and High Definition Video. The Optimized TopOwl (OTO) optics upgrades, reliability, additive manufacturing initiatives, will address multiple human factor improvements, to include Degraded

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245M / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

Visual Environment (DVE), as well as advanced boresighting and mapping improvements to improve weapons accuracy. The Digital Interoperability of the Helmet and Sensor will extend to improvements in ASE and Smart Dispense Technologies to improve aircraft survivability. Radar and Missile Warning improvements, including APR-39D(V)2 and the Distributed Aperture Infrared Countermeasures (DAIRCM), require extensive integration and testing. Development, test and integration efforts with the Advanced Precision Kill Weapons (APKWS), M299 Launcher improvements, Digital Rocket Launcher (DRL), AIM-9X, the AN/ALQ-231 (V) Intrepid Tiger II Electronic Warfare Pod and the Joint Air-to-Ground Missile (JAGM) Hellfire missile will follow in FY18. Improving and integrating weapon systems will align with these upgrades to improve the overall accuracy, lethality and survivability of the H1 platform.

These improvements will provide considerable growth potential for future weapon systems, air vehicle improvements, software improvements, and avionics upgrades, which will significantly increase mission effectiveness & survivability, while potentially reducing life cycle costs. The cockpits will also include integration of onboard mission planning, communications, digital fire control, self-navigation, night navigation/targeting, precision guided munitions, and air-launched intercept missile weapon systems management in nearly identical crew stations, which significantly reduce training requirements. These upgrades maximize commonality between all H-1 Type/Model/Series aircraft and provide needed improvements in crew and passenger reliability, survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Weapons and Sensors Testing and Integration	0.000	0.000	7.648	0.000	7.648
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Conduct prototype developmental testing of TSS Block Upgrade initiatives, to include software compatibility and high definition video feed to the Optimized Top Owl HMSD (Helmet Mounted Sight Display). Conduct HMSD optics testing, digital upgrades and Sensor/ASE interfaces. Continue enhanced digital capability efforts, Aircraft Survivability Equipment (ASE) improvements, Helmet Mounted Display improvements, with full visor integration and display enhancements, systems obsolescence mitigation efforts, as well as opportunities to improve support and test equipment modifications.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Funds increase from FY18 to FY19 due to transfer of effort from old PE 0604245N beginning in FY19.					
Title: Air Vehicle and Engines Improvements	0.000	0.000	28.841	0.000	28.841
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245M / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 Base Plans:*** Continue redesign of structural components to minimize excessive and premature wear, increase reliability, increase aircraft load capabilities, and improve existing design deficiencies. Continue redesign of the fuel system. Continue redesign of the aircraft electrical power-generating components and aircraft re-wiring to support power requirements for existing and future systems to include stores select-ability, future Avionics Survivability Equipment (ASE), emerging Electronic Warfare (EW), and Degraded Visual Environment (DVE) systems. Continue redesign of the Environmental Control Systems/Thermal to support other avionics on the UH-1Y/AH-1Z. Continue redesign of the drive system components (rotor brake/slip ring/standpipe/gearboxes/ drive shaft and couplers/chip detectors) to increase reliability and reduce high cost and/or failure rates. Continue upgrades and redesign of main and tail rotor blades. Continue survivability upgrades (canted forward chaff buckets, blast frag canopy, opaque armor, self-sealing fuel tanks, sump and backing board). Continue UH-1Y structural improvement program to increase capability including Intrepid Tiger, auxiliary fuel, cabin floor boards to prevent corrosion, floor panel access, and other structural reinforcements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funds increase from FY18 to FY19 due to transfer of effort from old PE 0604245N beginning in FY19.					
Title: Avionics Improvements	0.000	0.000	21.608	0.000	21.608
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Continue with software integration, Development Testing (DT) and Validation and Verification (V&V) activities associated with SCS 8.2. Support software design changes associated with SCS 8.2.2 in support of the new JAGM capability. Continue to support Avionics Test Facility (ATF), ATF SCS testing and debug. Initiate development of requirements and software architecture for SCS 9.0 to include Aircraft Network Switch (ANS), Advanced Data Transfer System (ADTS), AIM-9X, Tactical Secure Voice, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN), and Variable Message Format (VMF) Protocol for ARC-210 RT-1939A Radio. Complete development efforts on the Mission Computer (TRMC) redesign. Continue design, development and testing for digital interoperability improvements, additional waveform functionality, avionics components /					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245M / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
systems obsolescence mitigation efforts, peculiar avionics support equipment, automatic test equipment and mission computer SCS improvements, Satellite Communications improvement, Full Motion Video, UH-1Y Aft Cabin Display for situational awareness, portable tablet Marine Air-Ground Task Force (MAGTF) improvements, digital interoperability application of Variable Message Formatting (VMF), Aircraft Dependent Surveillance Broadcast (ADS-B), and additional waveform functionality. Continue enhancement efforts digital capability efforts, digital map and data storage capabilities, digital video recording, display systems, digital interoperability, digital systems upgrades, avionics regression testing. Initiate design and development on TAWS, Wireless Intercommunication Systems (WICS), Joint Battlefield Command - Platform (JBC-P), Mobile User Objective System (MUOS) for over the horizon communication, Degraded Visual Environment and collision avoidance capability, Embedded Global Positioning System/Inertial Navigation System (EGI) upgrade for Selective Availability Anti-Spoofing Module (SAASM), GPS non-precision approach capability and GPS signal protection efforts, Crash Survivable Flight Instrument Recorder (CSFIR), and Link tactical data exchange. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funds increase from FY18 to FY19 due to transfer of effort from old PE 0604245N beginning in FY19.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	58.097	0.000	58.097

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0178: *UH-1Y/AH-1Z APN1*	861.946	727.637	862.837	-	862.837	62.781	7.657	7.800	8.012	2.044	10,473.739
• APN/0178C: *UH-1Y/AH-1Z APN1 Advance Procurement*	49.208	42.082	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	500.492

Remarks

D. Acquisition Strategy

Follow-on H-1 Improvements will be developed using cost plus fixed fee type contracts.

E. Performance Metrics

Continue hardware and software development and test for follow-on H-1 Improvements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604245M / *H-1 Upgrades*	Project (Number/Name) 3359 / *H-1 Improvements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	BHTI : Amarillo, TX	0.000	0.000		0.000		19.828	Jan 2019	-		19.828	53.391	73.219	73.219
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.685	Nov 2018	-		0.685	4.718	5.403	-
		Subtotal	0.000	0.000		0.000		20.513		-		20.513	58.109	78.622	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	SS/CPFF	BHTI : Amarillo, TX	0.000	0.000		0.000		2.493	Feb 2019	-		2.493	12.923	15.416	15.416
Software Development	SS/FP	Northrup Grumman : Woodland Hills, CA	0.000	0.000		0.000		7.935	Nov 2018	-		7.935	40.484	48.419	48.419
Software Development	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		3.566	Nov 2018	-		3.566	18.367	21.933	-
		Subtotal	0.000	0.000		0.000		13.994		-		13.994	71.774	85.768	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.000		0.000		2.988	Nov 2018	-		2.988	10.012	13.000	-
Development Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		19.319	Nov 2018	-		19.319	101.001	120.320	-
		Subtotal	0.000	0.000		0.000		22.307		-		22.307	111.013	133.320	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604245M / *H-1 Upgrades*	Project (Number/Name) 3359 / *H-1 Improvements*	

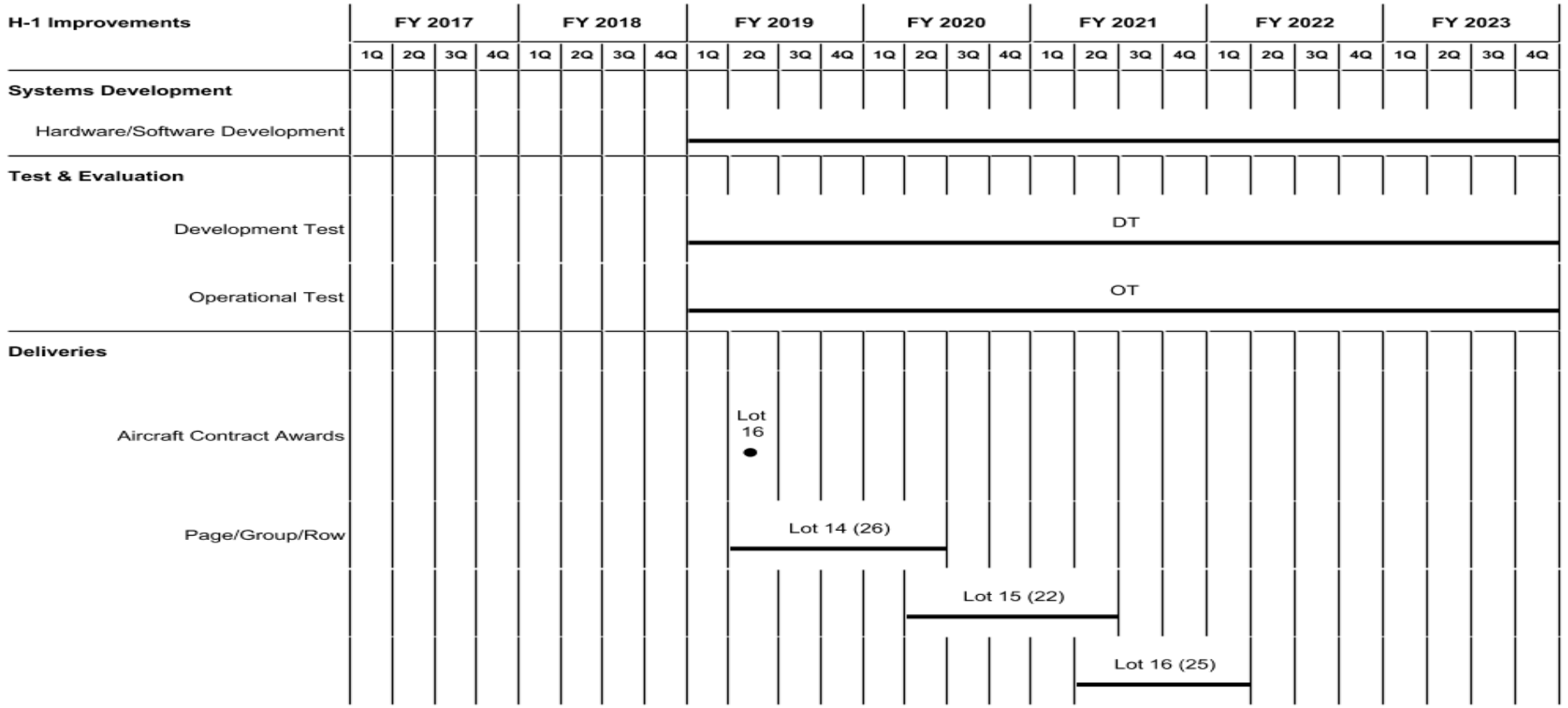
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	0.000	0.000		0.000		0.338	Nov 2018	-		0.338	1.392	1.730	1.730
Program Management Support	Various	Various : Various	0.000	0.000		0.000		0.703	Nov 2018	-		0.703	4.134	4.837	-
Travel	WR	NAVAIR : Patuxent River, MD	0.000	0.000		0.000		0.242	Oct 2018	-		0.242	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.283		-		1.283	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		58.097		-		58.097	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245M / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*



2019PB - 0604245M - 3359

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245M / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
H-1 Improvements				
Systems Development: Hardware/Software Development: Schedule Detail	1	2019	4	2023
Test & Evaluation: Development Test: H-1 Improvements DT	1	2019	4	2023
Test & Evaluation: Operational Test: H-1 Improvements OT	1	2019	4	2023
Deliveries: Aircraft Contract Awards: Lot 16	2	2019	2	2019
Deliveries: Page/Group/Row: Lot 14 FRP Z	2	2019	2	2020
Deliveries: Page/Group/Row: Lot 15 FRP Z	2	2020	2	2021
Deliveries: Page/Group/Row: Lot 16 FRP Z	2	2021	1	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604245N *I H-1 Upgrades*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	119.231	27.013	61.288	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	207.532
3359: *H-1 Improvements*	119.231	27.013	61.288	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	207.532

A. Mission Description and Budget Item Justification

The mission of the AH-1 attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance, survivability enhancements, and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1 utility helicopter is to provide command and control and combat assault support under day/night and adverse weather conditions and special operations support; supporting arms coordination and aeromedical evacuation. Major modifications for both aircraft include 37 AH-1Ws converted to AH-1Zs, build 152 new AH-1Zs, remanufacture ten (10) H-1N helicopters and build 150 new UH-1Y models. AH-1Z and UH-1Y models include a 4-bladed, composite rotor system with semi-automatic bladefold, performance-matched transmissions, T700 Engine Digital Electronic Control Units, 4-bladed tail rotors and drive systems, more effective stabilizers, upgraded landing gear, and common, fully integrated cockpits and avionics systems. These upgrades add 10,000 flight hours to AH-1Z/UH-1Y airframes. The fully integrated cockpits reduce operator workload and improve situational awareness, thus increasing safety and reducing the rate of aircraft attrition. They provide considerable growth potential for future weapon systems and avionics to significantly increase mission effectiveness and survivability. The cockpits also include integration of onboard mission planning, communications, digital fire control, self-navigation, night navigation/targeting, air-to-ground missile and air-launched intercept missile weapon systems management in nearly identical crew stations, which significantly reduces training requirements. These upgrades maximize commonality between the two aircraft and provide needed improvements in crew and passenger survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

This budget is required for follow-on improvements to H-1 aircraft via integration of sensors and weapons, avionics, and air vehicle components that will address deficiencies, systems safety, obsolescence, readiness, reliability, supportability, and relevance in the battlespace. Improvements will include all associated System Configuration Set (SCS) updates as well as integration and testing related to the aircraft platforms.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	27.441	61.288	59.827	-	59.827
Current President's Budget	27.013	61.288	0.000	-	0.000
Total Adjustments	-0.428	0.000	-59.827	-	-59.827
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.423	0.000			
• Program Adjustments	0.000	0.000	-58.507	-	-58.507

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604245N *I H-1 Upgrades*			
• Rate/Misc Adjustments	0.000	0.000	-1.320	-	-1.320
• Congressional General Reductions Adjustments	-0.005	-	-	-	-

Change Summary Explanation

Funds decrease from FY 2018 to FY 2019 due to transfer of effort to new PE 0604245M beginning in FY 2019.

Technical: None

Schedule: System Configuration Sets (SCS) will be continuously developed and released in conjunction with required hardware obsolescence and capability improvements. Software development as a whole are accounted for separately on the R-3 and are apportioned into development efforts for Avionics and Sensors & Weapons on the R-2a. Software is no longer portrayed separately on the R-2a or R-4 since SCS builds are linked to the development of hardware. The Mission Description section for Avionics and Sensors and Weapons state that SCS is part of each of the projects.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604245N / *H-1 Upgrades*	Project (Number/Name) 3359 / *H-1 Improvements*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3359: *H-1 Improvements*	119.231	27.013	61.288	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	207.532
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of H-1 Improvements is to provide follow-on Research, Development, Test and Evaluation efforts in support of all H-1 aircraft.

Air Vehicle and Engine improvements include analysis of structural data to formulate Damage Limits and Tolerances for structural components to reduce life cycle costs and maintenance workload; and redesign of structural components and drive system components to minimize excessive and premature wear, increase reliability, and improve existing design deficiencies. Additional air vehicle upgrades include: redesign of the aircraft power-generating and electrical components (generators, inverters, wiring) to support power requirements for existing and future systems (Aircraft Survivability Equipment, emerging electronic warfare, and Degraded Visual Environment), redesign of the Environmental Control System /Thermal Redesign to support cooling of Technology Refresh Mission Computer and other avionics, redesign to add an auxiliary fuel capability, Intrepid Tiger, and upgrades the UH-1Y cabin floor panels.

Avionics improvements target digital inter-operability, integrated avionics, safety & survivability, and situational awareness for both the pilot and aircrew safety. This includes integrating Joint Battle Command-Platform (JBC-P), Full Motion Video (FMV), Degraded Visual Environment (DVE), Helmet Mounted Display improvements, cockpit displays, precision and GPS non-precision landing capability, Crash Survivable Flight Incident Recorder, collision avoidance, improved Embedded Global Positioning System (EGI), Inertial Navigation System (INS), targeting sensor systems and mission computer. H-1 capability improvements include improved Aircraft Survivability Equipment (ASE), digital operations & transfer of data, digital interoperability, digital video recording, video and data networking, and information integration with aviation combat elements and Marine Air Ground Task Force elements. Mandated capability efforts include - Communications, Navigation and Surveillance system/ Air Traffic Management (CNS/ATM), Required Navigation Performance/Area Navigation (RNP/RNAV), GPS Selective Availability Anti-Spoofing Module (SAASM), Automatic Dependent Surveillance - Broadcast (ADS-B), Crash Survivable Flight Incident Recorder, development efforts required for Depot standup and incorporation of technology and information protection/Information Assurance in critical avionics and sensor systems. In addition, the goal is to reduce total ownership cost for H-1 aircraft and related support systems by improving reliability and maintainability of critical flight and avionics systems along with associated peculiar avionics support equipment and incorporating fact-of-life obsolescence solutions. All avionics improvements include related System Configuration Set (SCS) development updates and testing.

Sensors, Weapons and Helmet Mounted Display System improvements include, manufacturing process improvements, hardware and software redesign to improve reliability, improve production methodologies, implement program security initiatives and increase the collective capability to address emerging battlefield threats. These improvements also address reliability and obsolescence, which collectively enhance Fleet readiness. The technical interface between the aircraft sensor, helmet and weapons is increasingly challenging to effectively employ advanced precision guided weapons and Aircraft Survivability Equipment (ASE) for the interface between the sensors, helmet and precision guided munitions. These systems require extensive software and hardware upgrades that translate into meaningful, sensor fusion based solutions, to provide both battlefield and situational awareness to the H1 platform. Specifically, the AN/ALQ-30 Target Sight System (TSS) will implement several block upgrade efforts with improvements to the IR Pointer, Laser and Cameras as well as adding capabilities such as Laser Spot Tracker and High Definition Video. The Optimized TopOwl (OTO) optics upgrades, reliability, additive manufacturing initiatives, will address multiple human factor improvements, to include Degraded

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245N / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

Visual Environment (DVE), as well as advanced boresighting and mapping improvements to improve weapons accuracy. The Digital Interoperability of the Helmet and Sensor will extend to improvements in ASE and Smart Dispense Technologies to improve aircraft survivability. Radar and Missile Warning improvements, including APR-39D(V)2 and the Distributed Aperture Infrared Countermeasures (DAIRCM), require extensive integration and testing. Development, test and integration efforts with the Advanced Precision Kill Weapons (APKWS), M299 Launcher improvements, Digital Rocket Launcher (DRL), AIM-9X, the AN/ALQ-231 (V) Intrepid Tiger II Electronic Warfare Pod and the Joint Air-to-Ground Missile (JAGM) Hellfire missile will follow in FY18. Improving and integrating weapon systems will align with these upgrades to improve the overall accuracy, lethality and survivability of the H1 platform.

These improvements will provide considerable growth potential for future weapon systems, air vehicle improvements, software improvements, and avionics upgrades, which will significantly increase mission effectiveness & survivability, while potentially reducing life cycle costs. The cockpits will also include integration of onboard mission planning, communications, digital fire control, self-navigation, night navigation/targeting, precision guided munitions, and air-launched intercept missile weapon systems management in nearly identical crew stations, which significantly reduce training requirements. These upgrades maximize commonality between all H-1 Type/Model/Series aircraft and provide needed improvements in crew and passenger reliability, survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: System Configuration Set Development	13.058	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No funding change from FY18 to FY19.					
Title: Weapons and Sensors Testing and Integration	1.046	7.381	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Develop, test and integrate hardware, software changes to address parts obsolescence and deficiencies identified in test for aircraft sensors; Target Sight Systems (TSS) TEU-VPX OFP. Define and initiate a Requirements Trade Study for a Block Upgrade to the TSS. Continue software integration of JAGM and test functionality and compatibility with aircraft software in support of missile developmental testing. Initiate requirements analysis and develop, test and integrate hardware, software changes for a redesigned Digital					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245N / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Rocket Launcher (DRL). Develop, test and integrate hardware changes to the OTO Helmet, to include Display Module improvements and defining Cockpit Mapping Robot requirements. Continue with development testing of JAGM and DRL. Conduct DT Assist for JAGM and Operational Assessments of BS II and Intrepid Tiger improvements. ***FY 2019 Base Plans:*** Conduct prototype developmental testing of TSS Block Upgrade initiatives, to include software compatibility and high definition video feed to the Optimized Top Owl HMSD (Helmet Mounted Sight Display). Conduct HMSD optics testing, digital upgrades and Sensor/ASE interfaces. Continue enhanced digital capability efforts, Aircraft Survivability Equipment (ASE) improvements, Helmet Mounted Display improvements, with full visor integration and display enhancements, systems obsolescence mitigation efforts, as well as opportunities to improve support and test equipment modifications. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funds decrease from FY18 to FY19 due to transfer of effort to new PE 0604245M beginning in FY19.					
Title: Air Vehicle and Engines Improvements	9.250	32.575	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Continue redesign of structural components to minimize excessive and premature wear, increase reliability, increase aircraft load capabilities, and improve existing design deficiencies. Continue redesign of the fuel system, and aerial refueling capability. Continue AC/DC generator Small Business Innovation Research (SBIR) and initiate redesign of the aircraft electrical power-generating components and aircraft re-wiring to support power requirements for existing and future systems to include stores select-ability, future Avionics Survivability Equipment (ASE), emerging Electronic Warfare (EW), and Degraded Visual Environment (DVE) systems. Continue Environmental Control Systems/Thermal Redesign to support other avionics on the UH-1Y/AH-1Z. Continue redesign of the drive system components (rotor brake/slip ring/standpipe/gearboxes/drive shaft and couplers/chip detectors) to increase reliability and reduce high cost and/or failure rates. Continue upgrades and redesigns of main and tail rotor blades. Continue survivability upgrades (canted forward chaff buckets, blast frag canopy, opaque armor, self-sealing fuel tanks, sump and backing board). Initiate UH-1Y structural improvements					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245N / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
to increase capability including Intrepid Tiger, auxiliary fuel, cabin floor boards to prevent corrosion, floor panel access, and other structural reinforcements. ***FY 2019 Base Plans:*** Continue redesign of structural components to minimize excessive and premature wear, increase reliability, increase aircraft load capabilities, and improve existing design deficiencies. Continue redesign of the fuel system. Continue redesign of the aircraft electrical power-generating components and aircraft re-wiring to support power requirements for existing and future systems to include stores select-ability, future Avionics Survivability Equipment (ASE), emerging Electronic Warfare (EW), and Degraded Visual Environment (DVE) systems. Continue redesign of the Environmental Control Systems/Thermal to support other avionics on the UH-1Y/AH-1Z. Continue redesign of the drive system components (rotor brake/slip ring/standpipe/gearboxes/ drive shaft and couplers/chip detectors) to increase reliability and reduce high cost and/or failure rates. Continue upgrades and redesign of main and tail rotor blades. Continue survivability upgrades (canted forward chaff buckets, blast frag canopy, opaque armor, self-sealing fuel tanks, sump and backing board). Continue UH-1Y structural improvement program to increase capability including Intrepid Tiger, auxiliary fuel, cabin floor boards to prevent corrosion, floor panel access, and other structural reinforcements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funds decrease from FY18 to FY19 due to transfer of effort to new PE 0604245M beginning in FY19.					
Title: Avionics Improvements	3.659	21.332	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Continue design and development for digital interoperability improvements, avionics systems obsolescence mitigation efforts, and peculiar avionics support equipment, automatic test equipment, mission computer SCS improvements, satellite communication improvement, digital interoperability application of Variable Message Formatting (VMF), Aircraft Dependent Surveillance Broadcast (ADS-B), Selective Availability Anti-Spoofing Module (SAASM), GPS non-precision approach capability and Navigation Warfare (NAVWAR) GPS signal protection efforts; UH-1Y aft cabin display for situational awareness and portable tablet Marine Air-Ground Task Force (MAGTF) improvements; Continue development and testing for digital interoperability improvements, additional waveform functionality, and avionics systems obsolescence mitigation efforts, and peculiar avionics support equipment, automatic test equipment and mission computer SCS improvements, ASE, EW, Satellite Communications Full Motion Video, UH-1Y Aft Cabin Display and additional waveform					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245N / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
functionality, Aircraft Dependent Surveillance Broadcast (ADS-B), digital map and data storage capabilities, digital video recording, avionics components obsolescence mitigation and regression testing; Continue enhancement efforts digital capability efforts, digital map and data storage capability, digital video recording, avionics components obsolescence and regression testing, display systems, digital interoperability, satellite communication, digital systems upgrades, avionics components obsolescence mitigation and regression testing, enhanced digital capability efforts, other ASE improvements, avionics systems obsolescence mitigation efforts, development of peculiar avionics support equipment, and development of automatic test equipment; Initiate design and development on TAWS, Wireless Intercommunication Systems (WICS), Joint Battlefield Command - Platform (JBC-P), Mobile User Objective System (MUOS) for over the horizon communication, Degraded Visual Environment and collision avoidance capability, Embedded Global Positioning System/Inertial Navigation System (EGI) upgrade for Selective Availability Anti-Spoofing Module (SAASM), GPS non-precision approach capability and Navigation Warfare (NAVWAR) GPS signal protection efforts, Crash Survivable Flight Instrument Recorder (CSFIR), and Link tactical data exchange.					
FY 2019 Base Plans: Continue with software integration, Development Testing (DT) and Validation and Verification (V&V) activities associated with SCS 8.2. Support software design changes associated with SCS 8.2.2 in support of the new JAGM capability. Continue to support Avionics Test Facility (ATF), ATF SCS testing and debug. Initiate development of requirements and software architecture for SCS 9.0 to include Aircraft Network Switch (ANS), Advanced Data Transfer System (ADTS), AIM-9X, Tactical Secure Voice, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN), and Variable Message Format (VMF) Protocol for ARC-210 RT-1939A Radio. Complete development efforts on the Mission Computer (TRMC) redesign. Continue design, development and testing for digital interoperability improvements, additional waveform functionality, avionics components / systems obsolescence mitigation efforts, peculiar avionics support equipment, automatic test equipment and mission computer SCS improvements, Satellite Communications improvement, Full Motion Video, UH-1Y Aft Cabin Display for situational awareness, portable tablet Marine Air-Ground Task Force (MAGTF) improvements, digital interoperability application of Variable Message Formatting (VMF), Aircraft Dependent Surveillance Broadcast (ADS-B), and additional waveform functionality. Continue enhancement efforts digital capability efforts, digital map and data storage capabilities, digital video recording, display systems, digital interoperability, digital systems upgrades, avionics regression testing. Initiate design and development on TAWS, Wireless Intercommunication Systems (WICS), Joint Battlefield Command - Platform (JBC-P), Mobile User Objective System (MUOS) for over the horizon communication, Degraded Visual Environment and collision avoidance capability, Embedded Global Positioning System/Inertial Navigation System (EGI) upgrade for Selective					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245N / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Availability Anti-Spoofing Module (SAASM), GPS non-precision approach capability and GPS signal protection efforts, Crash Survivable Flight Instrument Recorder (CSFIR), and Link tactical data exchange. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funds decrease from FY18 to FY19 due to transfer of effort to new PE 0604245M beginning in FY19.					
Accomplishments/Planned Programs Subtotals	27.013	61.288	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0178: *UH-1Y/AH-1Z APN1*	861.946	727.637	862.837	-	862.837	62.781	7.657	7.800	8.012	2.044	10,473.739
• APN/0178C: *UH-1Y/AH-1Z APN1 Advance Procurement*	49.208	42.082	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	500.492

Remarks

D. Acquisition Strategy

Follow-on H-1 Improvements will be developed using cost plus fixed fee type contracts.

E. Performance Metrics

Continue hardware and software development and test for follow-on H-1 Improvements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604245N / *H-1 Upgrades*	Project (Number/Name) 3359 / *H-1 Improvements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	BHTI : Amarillo, TX	17.009	5.140	Jan 2017	22.748	Jan 2018	0.000		-		0.000	0.000	44.897	44.897
Primary Hardware Development	SS/CPFF	Northrup Grumman : Woodland Hills, CA	2.714	0.000		0.000		0.000		-		0.000	0.000	2.714	2.714
Systems Engineering	WR	NAWCAD : Patuxent River, MD	2.429	0.525	Nov 2016	0.677	Nov 2017	0.000		-		0.000	0.000	3.631	-
		Subtotal	22.152	5.665		23.425		0.000		-		0.000	0.000	51.242	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	SS/CPFF	BHTI : Amarillo, TX	20.198	4.633	Feb 2017	9.131	Feb 2018	0.000		-		0.000	0.000	33.962	33.962
Software Development	SS/FP	Northrup Grumman : Woodland Hills, CA	6.340	1.664	Nov 2016	1.882	Nov 2017	0.000		-		0.000	0.000	9.886	9.886
Software Development	WR	NAWCWD : China Lake, CA	23.352	6.761	Nov 2016	3.523	Nov 2017	0.000		-		0.000	0.000	33.636	-
		Subtotal	49.890	13.058		14.536		0.000		-		0.000	0.000	77.484	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	6.590	0.810	Nov 2016	2.953	Nov 2017	0.000		-		0.000	0.000	10.353	-
Development Test and Evaluation	WR	NAWCAD : Patuxent River, MD	36.484	6.225	Nov 2016	19.105	Nov 2017	0.000		-		0.000	0.000	61.814	-
		Subtotal	43.074	7.035		22.058		0.000		-		0.000	0.000	72.167	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245N / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

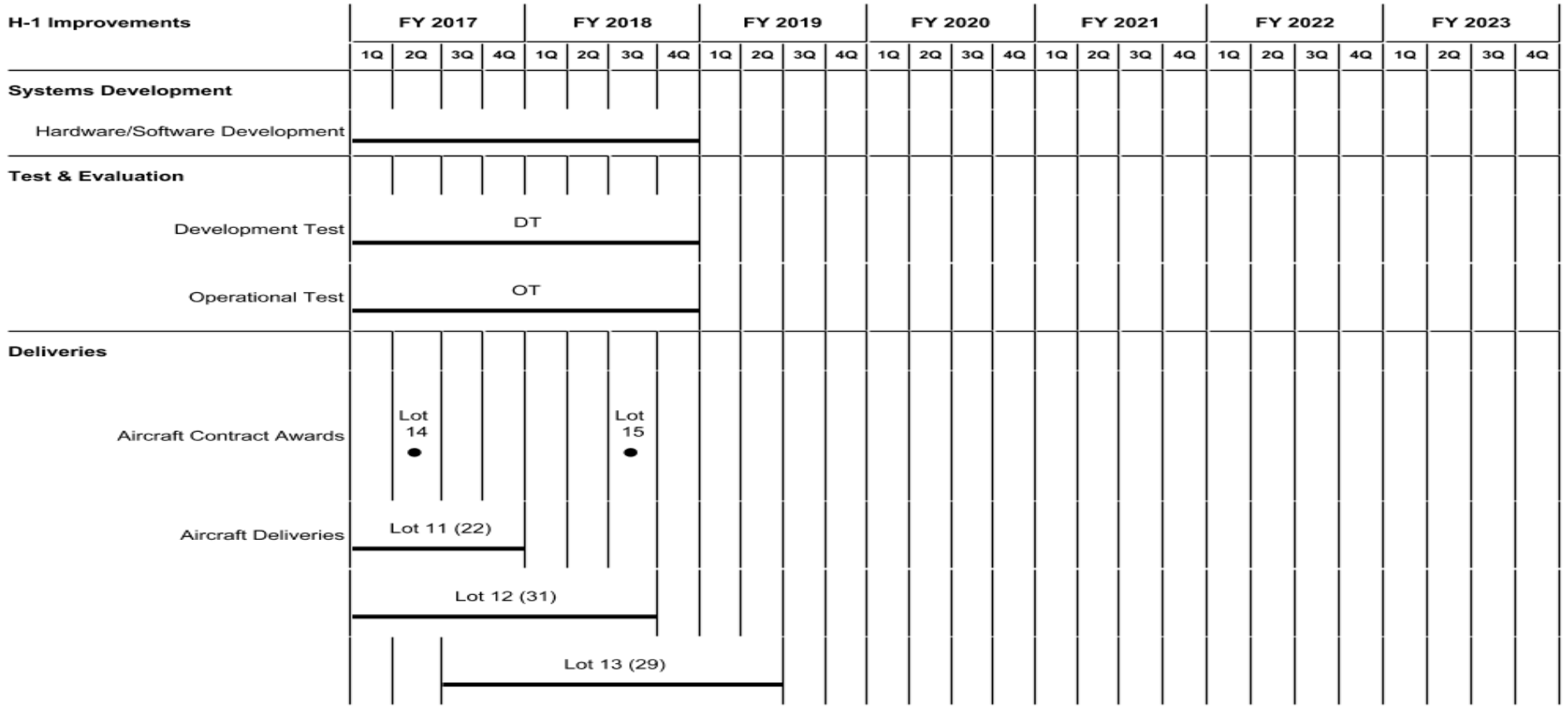
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	0.966	0.330	Nov 2016	0.334	Nov 2017	0.000		-		0.000	0.000	1.630	1.630
Program Management Support	Various	Various : Various	2.505	0.687	Nov 2016	0.695	Nov 2017	0.000		-		0.000	0.000	3.887	-
Travel	WR	NAVAIR : Patuxent River, MD	0.644	0.238	Oct 2016	0.240	Oct 2017	0.000		-		0.000	0.000	1.122	-
		Subtotal	4.115	1.255		1.269		0.000		-		0.000	0.000	6.639	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	119.231	27.013		61.288		0.000		-		0.000	0.000	207.532	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245N / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*



2019PB - 0604245N - 3359

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604245N / *H-1 Upgrades*	**Project (Number/Name)** 3359 / *H-1 Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
H-1 Improvements				
Systems Development: Hardware/Software Development: Schedule Detail	1	2017	4	2018
Test & Evaluation: Development Test: H-1 Improvements DT	1	2017	4	2018
Test & Evaluation: Operational Test: H-1 Improvements OT	1	2017	4	2018
Deliveries: Aircraft Contract Awards: Lot 14	2	2017	2	2017
Deliveries: Aircraft Contract Awards: Lot 15	3	2018	3	2018
Deliveries: Aircraft Deliveries: Lot 11 FRP Y + Z	1	2017	4	2017
Deliveries: Aircraft Deliveries: Lot 12 FRP Y + Z	1	2017	3	2018
Deliveries: Aircraft Deliveries: Lot 13 FRP Y + Z	3	2017	2	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604261N *I Acoustic Search Sensors*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	486.905	28.940	37.167	42.485	-	42.485	47.083	48.074	49.003	49.998	Continuing	Continuing
0480: *ASW Sensors & Proc*	373.762	24.544	33.423	38.599	-	38.599	43.116	44.025	44.875	45.786	Continuing	Continuing
3224: *High Altitude ASW*	113.143	4.396	3.744	3.886	-	3.886	3.967	4.049	4.128	4.212	Continuing	Continuing

A. Mission Description and Budget Item Justification

Includes RDT&E funds for engineering development and operational test and evaluation of acoustic search sensors/systems and complementary equipment for Anti-Submarine Warfare (ASW) aircraft.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	34.525	37.167	28.962	-	28.962
Current President's Budget	28.940	37.167	42.485	-	42.485
Total Adjustments	-5.585	0.000	13.523	-	13.523
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.020	0.000			
• SBIR/STTR Transfer	-0.564	0.000			
• Rate/Misc Adjustments	-0.001	0.000	13.523	-	13.523
• Congressional Directed Reductions Adjustments	-5.000	-	-	-	-

Change Summary Explanation

Funding: Funds Multi-Static Active Coherent Enhancements (MAC-E) development.

Technical: Not applicable.

Schedule:

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604261N *I Acoustic Search Sensors*

0480 Schedule 1. Added 2Q/FY17 Integration Contract Award; MAC-E Critical Design Review (CDR); and Next Generation MAC-E Contract Award.

0480 Schedule 2. Not applicable.

0480 Schedule 3. Not applicable.

3224 Schedule. Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / *Acoustic Search Sensors*	Project (Number/Name) 0480 / *ASW Sensors & Proc*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0480: *ASW Sensors & Proc*	373.762	24.544	33.423	38.599	-	38.599	43.116	44.025	44.875	45.786	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Anti-Submarine Warfare (ASW) Sensors and Processing project provides the tools and methods necessary to maintain naval superiority by preventing threat submarines from disrupting the U.S. Navy's ability to control the sea lines of communication and completing their hostile missions. This project encompasses the Engineering & Manufacturing Development phase and the follow on Production and Deployment Phase of sensor systems to improve the mission effectiveness of airborne ASW platforms in cueing, searching, localizing, tracking, and attacking subsurface targets. Smaller and quieter threat submarines drive the requirement for continued advancement in ASW sensor capabilities for both blue water and littoral environments. The littoral regions of the world create an additional ASW challenge to overcome the increase in background clutter caused by the shallow water depth, high volume of shipping, and commercial radio frequency interference. Project 0480 provides funding to the passive and active ASW family of systems for the engineering development of solutions that detect, classify, and track threat submarines. The Multi-Static Active Coherent (MAC) program encompasses modifications to the active coherent (electronic) source sonobuoy and the Air Deployable Active Receiver sonobuoy and development, integration, and test of aircraft software. It also provides upgrades to the Multi-static mission planning tool, the tactical crew trainers and the tactical ground replay system. This program includes MAC Enhancements (MAC-E) that will shorten the ASW kill chain by enabling the warfighter to search larger areas in less time with more precision.

Project 0480 also provides funding for the Advanced Product Build (APB) program which integrates Office of Naval Research (ONR) Future Naval Capabilities (FNCs), Small Business Innovation Research (SBIR), University Affiliated Research Center (UARC) and other mature technologies into the processing baseline. Efforts incorporate clutter reduction, automation, improved displays and controls, as well as improved communication links resulting in reduced operator workload, increased target detection opportunities, and improved classification techniques. APB also includes an Air ASW Engineering Measurement Program (AEMP) that collects ASW operational system performance data and identifies areas where beneficial improvements can be incorporated across all Air ASW platforms. APB will deliver a new software build nominally in two year increments following MAC-E. The sonobuoy test articles in FY17-FY23 will support software and hardware integration flight tests and Technical Evaluation/Follow-On Test & Evaluation for the MAC program. Additionally, this project funds an urgent effort in support of the Navy's Theater Anti-Submarine Warfare offset strategy. Funding supports the rapid development, fielding and evaluation of a prototype distributed and netted undersea sensor system to meet an urgent combatant commanders' (U.S. European Command, U.S. Northern Command, U.S. Strategic Command) requirement for additional maritime Intelligence, Surveillance and Reconnaissance (ISR) capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: APB System Qualification Test/Fleet Release for P-3C. Rapid Capability Insertion (RCI)/Fleet Release for P-8A	2.200	11.423	11.391	0.000	11.391
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 0480 / *ASW Sensors & Proc*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue software development/EMP for P-8A RCI (2). Continue MAC FITs for P-8A squadrons. ***FY 2019 Base Plans:*** Continue software development/EMP for P-8A RCI (2). Continue MAC FITs for P-8A squadrons. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to Navy-wide efficiencies and rate adjustments.					
Title: Multi-static Active Coherent (MAC)	20.519	22.000	27.208	0.000	27.208
Articles:	200	75	100	-	100
FY 2018 Plans: Continue MAC-E software development. Deliver SSQ-125A for Production Readiness Model (PRM) units. Conduct SSQ-125A/MAC-E development test. ***FY 2019 Base Plans:*** Continue MAC-E software development. Deliver SSQ-125A PRM units. Conduct SSQ-125A/MAC-E development test. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY19 increase funds Increment 3 acoustics development/integration efforts and scheduled MAC-E risk reduction testing.					
Title: Navy Theater ASW Offset Strategy	1.825	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 0480 / *ASW Sensors & Proc*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No change from FY 2018 to FY 2019.					
Accomplishments/Planned Programs Subtotals	24.544	33.423	38.599	0.000	38.599

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/4048: *Sonobuoys - AN/SSQ-125 (Multistatic Coherent Source)*	25.978	41.169	72.455	0.403	72.858	52.222	57.059	59.953	51.707	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Multistatic Active Coherent (MAC) ASW system and associated sonobuoys are fully integrated on the P-3C and P-8A ASW platforms. MAC Enhancements (MAC-E) is a development program associated with P-8A increment 3 that will significantly increase the wide area search capability through Engineering Change Proposals (ECPs) to the sonobuoys, aircraft software modifications to reduce clutter and improve processing, and OMI improvements to reduce operator workload. S&T and early R&D ASW improvement programs are matured through the APB process for periodic Fleet software releases.

E. Performance Metrics

High level operational system requirements are documented in the MAC Capability Production Document (CPD). Cost, schedule, and performance metrics are tracked throughout the development phase of the program to ensure the operational requirements will be met or exceeded during an extensive DT/OT cycle.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / *Acoustic Search Sensors*	Project (Number/Name) 0480 / *ASW Sensors & Proc*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Development	SS/CPIF	ERAPSCO : FT. WAYNE IN	18.805	2.403	Dec 2016	3.592	Dec 2017	2.047	Dec 2018	-		2.047	17.500	44.347	44.347
Prior year Prod Dev no longer funded in the FYDP	Various	VARIOUS : VARIOUS	19.905	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development	C/CPIF	Boeing : Huntington Beach, CA	0.000	0.000		0.000		11.008	Dec 2018	-		11.008	0.000	11.008	-
		Subtotal	38.710	2.403		3.592		13.055		-		13.055	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	WR	NAWCAD : PATUXENT RIVER, MD	28.304	2.436	Dec 2016	6.068	Dec 2017	5.553	Dec 2018	-		5.553	Continuing	Continuing	Continuing
Software Development	SS/CPIF	LOCKHEED MARTIN : MANASSAS VA	10.329	1.373	Dec 2016	1.870	Dec 2017	1.750	Dec 2018	-		1.750	3.727	19.049	18.749
Software Development	Various	VARIOUS : VARIOUS	15.073	6.369	Dec 2016	7.753	Dec 2017	6.750	Dec 2018	-		6.750	Continuing	Continuing	Continuing
Studies & Analysis	WR	NAWCAD : PATUXENT RIVER, MD	18.254	1.819	Dec 2016	2.807	Dec 2017	1.979	Dec 2018	-		1.979	Continuing	Continuing	Continuing
Technical Data	WR	NAWCAD : PATUXENT RIVER, MD	16.031	0.343	Dec 2016	0.337	Dec 2017	0.350	Dec 2018	-		0.350	Continuing	Continuing	Continuing
Training	WR	NAWCAD : PATUXENT RIVER, MD	2.114	2.095	Dec 2016	2.360	Dec 2017	2.528	Dec 2018	-		2.528	Continuing	Continuing	Continuing
		Subtotal	90.105	14.435		21.195		18.910		-		18.910	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / *Acoustic Search Sensors*	Project (Number/Name) 0480 / *ASW Sensors & Proc*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Eval	WR	NAWCAD : PATUXENT RIVER, MD	29.635	2.668	Dec 2016	3.689	Dec 2017	3.050	Dec 2018	-		3.050	Continuing	Continuing	Continuing
		Subtotal	29.635	2.668		3.689		3.050		-		3.050	Continuing	Continuing	N/A

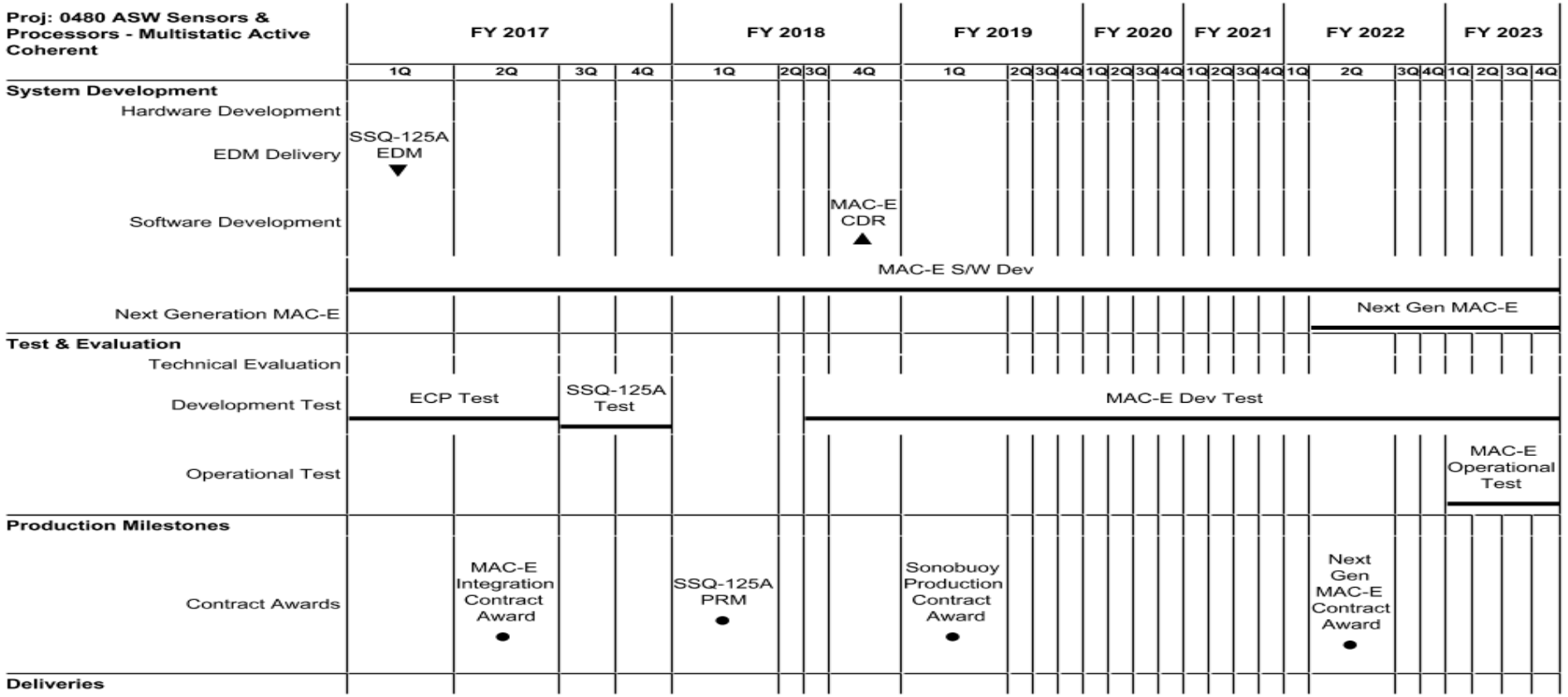
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Spt	Various	VARIOUS : VARIOUS	42.599	2.010	Dec 2016	2.050	Dec 2017	1.275	Dec 2018	-		1.275	Continuing	Continuing	Continuing
Contractor Eng Spt	C/CPFF	NAVMAR APPLIED SCIENCES CORP : WARMINSTER, PA	6.549	1.030	Dec 2016	1.011	Dec 2017	1.000	Dec 2018	-		1.000	2.810	12.400	11.400
Government Eng Spt	WR	NAWCAD : PATUXENT RIVER, MD	97.982	0.500	Dec 2016	0.386	Dec 2017	0.300	Dec 2018	-		0.300	Continuing	Continuing	Continuing
Eng & Tech Spt Srvc (NON-FFRDC)	Various	VARIOUS : VARIOUS	57.296	1.498	Dec 2016	1.500	Dec 2017	1.009	Dec 2018	-		1.009	Continuing	Continuing	Continuing
Mgt & Prof SptT Srvc (FFRDC)	Various	VARIOUS : VARIOUS	10.018	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Years Mgmt Svcs no longer funded in the FYDP	Various	VARIOUS : VARIOUS	0.868	0.000		0.000		0.000		-		0.000	0.000	0.868	-
		Subtotal	215.312	5.038		4.947		3.584		-		3.584	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	373.762	24.544		33.423		38.599		-		38.599	Continuing	Continuing	N/A

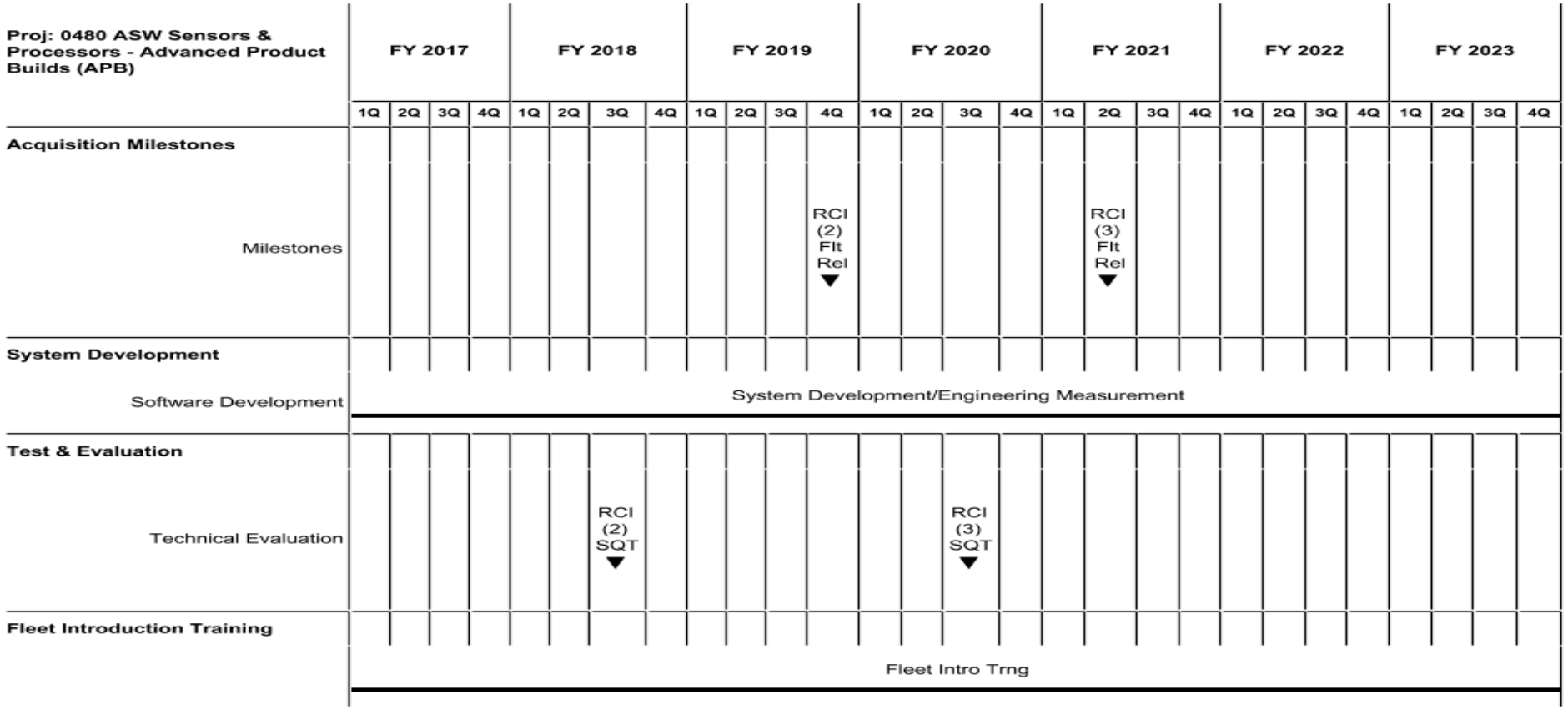
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 0480 / *ASW Sensors & Proc*



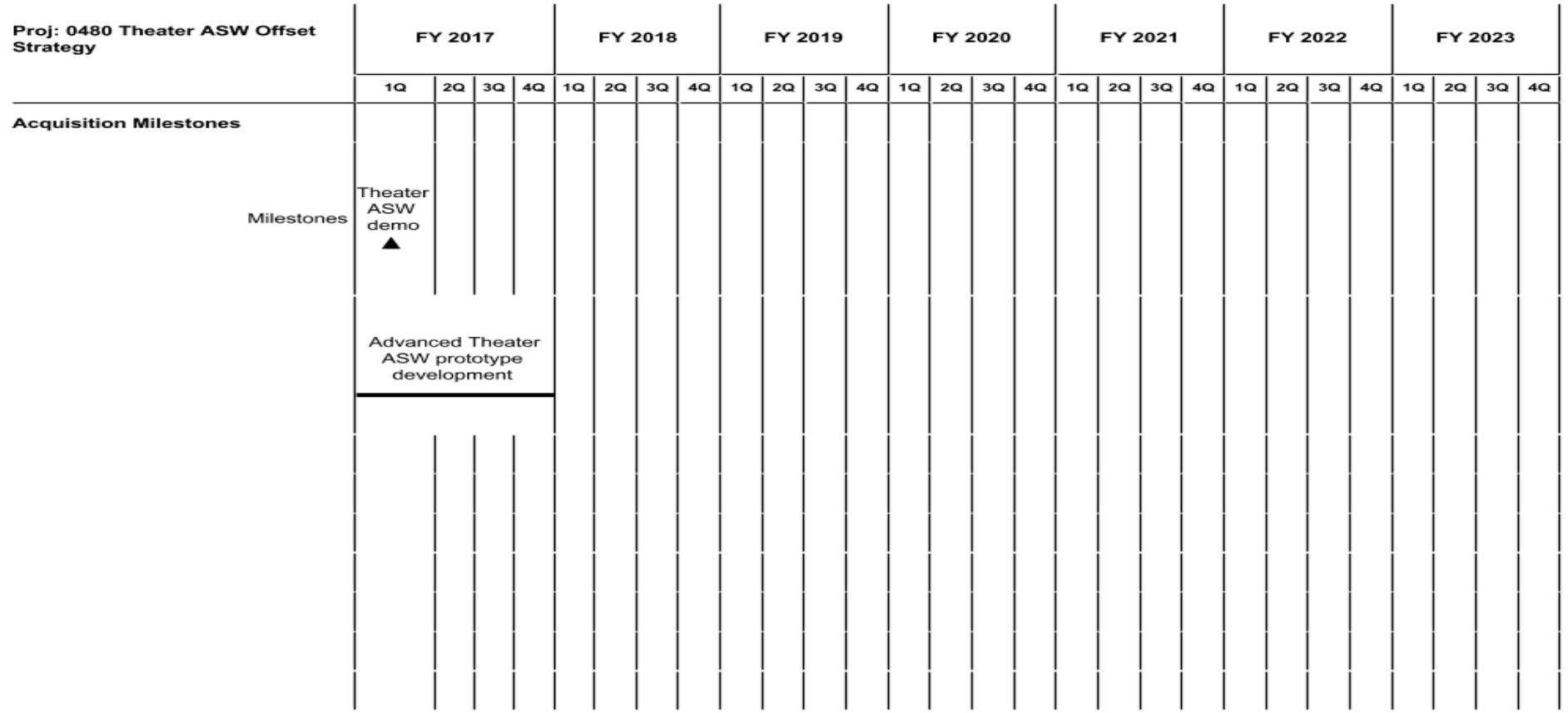
2019PB - 0604261N - 0480

Exhibit R-4, **RDT&E Schedule Profile:** PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 0480 / *ASW Sensors & Proc*



2019PB - 0604261N - 0480

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 0480 / *ASW Sensors & Proc*



2019PB - 0604261N - 0480

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 0480 / *ASW Sensors & Proc*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj: 0480 ASW Sensors & Processors - Multistatic Active Coherent				
System Development: EDM Delivery: Eng Dev Model (H/W EDM) 2	1	2017	1	2017
System Development: Software Development: Critical Design Review	4	2018	4	2018
System Development: Software Development: MAC-E Software Development	1	2017	4	2023
System Development: Next Generation MAC-E: Next Gen MAC-E	2	2022	4	2023
Test & Evaluation: Development Test: Engineering Change Proposal Test	1	2017	2	2017
Test & Evaluation: Development Test: SSQ-125A Test	3	2017	4	2017
Test & Evaluation: Development Test: MAC-E Development Test	3	2018	4	2023
Test & Evaluation: Operational Test: MAC-E Operational Test	1	2023	4	2023
Production Milestones: Contract Awards: SSQ-125A PRM	1	2018	1	2018
Production Milestones: Contract Awards: MAC-E Integration Contract Award	2	2017	2	2017
Production Milestones: Contract Awards: Sonobuoy Production Contract Award	1	2019	1	2019
Production Milestones: Contract Awards: Next Gen MAC-E Contract Award	2	2022	2	2022
Proj: 0480 ASW Sensors & Processors - Advanced Product Builds (APB)				
Acquisition Milestones: Milestones: RCI (2) Fleet Release	4	2019	4	2019
Acquisition Milestones: Milestones: RCI (3) Fleet Release	2	2021	2	2021
System Development: Software Development: System Development/Engineering Measurement	1	2017	4	2023
Test & Evaluation: Technical Evaluation: RCI (2) SQT	3	2018	3	2018
Test & Evaluation: Technical Evaluation: RCI (3) SQT	3	2020	3	2020
Fleet Introduction Training: Fleet Introduction Training	1	2017	4	2023
Proj: 0480 Theater ASW Offset Strategy				
Acquisition Milestones: Milestones: Theater ASW Demonstration	1	2017	1	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 0480 / *ASW Sensors & Proc*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Milestones: Advanced Theater ASW prototype development	1	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / *Acoustic Search Sensors*	Project (Number/Name) 3224 / *High Altitude ASW*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3224: *High Altitude ASW*	113.143	4.396	3.744	3.886	-	3.886	3.967	4.049	4.128	4.212	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The High Altitude Anti-Submarine Warfare (HAASW) program increases P-8A operational flexibility and effectiveness throughout the kill chain at higher than traditional ASW altitudes. FY10-FY16 activities included Sonobuoy Technology Development (TD), P-8A Aircraft integration, Training, Test & Evaluation, and Initial Operational Capability. TD includes hardware modifications to current production sonobuoys and software development for the aircraft. Global Positioning System (GPS) integration will provide precise sonobuoy location regardless of aircraft altitude/location to enhance wide area ASW search, localization, track and targeting. The digital telemetry will improve sonobuoy communication performance in high Radio Frequency Interference environments, increase Air Deployable Active Receiver (SSQ-101) channel availability, and provide NATO compatibility. FY16-FY18 activities include the integration of an algorithm that will adjust sonobuoy release/drop points for more accurate sonobuoy placement. FY16-FY22 activities include the integration of cyber security protections.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: High Altitude Enablers	4.396	3.744	3.886	0.000	3.886
Articles:	-	-	-	-	-
FY 2018 Plans: Continue ECP 3 FOT&E. Continue digital telemetry/cyber security requirements analysis. Initiate digital telemetry integration.					
FY 2019 Base Plans: Continue ECP 3 FOT&E. Continue digital telemetry/cyber security requirements analysis. Initiate digital telemetry integration.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Funds HAASW digital telemetry/cyber security requirements analysis.					
Accomplishments/Planned Programs Subtotals	4.396	3.744	3.886	0.000	3.886

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/4048: *Sonobuoys - All Types*	158.588	173.616	177.891	21.156	199.047	177.906	181.402	188.877	192.752	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 3224 / *High Altitude ASW*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

A 15 March 12 Acquisition Decision Memorandum (ADM) from PEO(A) (Milestone Decision Authority) approved the transition from a planned Acquisition Category (ACAT) Program to a series of Engineering Change Proposal (ECP) modifications to the AN/SSQ-53, AN/SSQ-62 and AN/SSQ-101 sonobuoys. Affordability deferred the digital telemetry requirement in the SSQ-53, SSQ-62 and SSQ-125 sonobuoys to FY16-FY22. All major contracts (ERAPSCO & Boeing) to meet P-8A Inc 2 ECP 2 and ECP 3 requirements have been awarded. Integrate cyber security protections.

E. Performance Metrics

Schedule and cost variances are used to track sonobuoy development. Should Cost methodology has also been employed to manage the development and production costs of the HAASW capable sonobuoys.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / *Acoustic Search Sensors*	Project (Number/Name) 3224 / *High Altitude ASW*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Development	SS/CPIF	ERAPSCO : FT. WAYNE IN	36.917	1.500	Nov 2016	0.000		0.000		-		0.000	0.000	38.417	38.417
Primary Hdw Development	C/CPFF	VARIOUS : VARIOUS	0.600	1.300	Nov 2016	0.850	Nov 2017	1.000	Nov 2018	-		1.000	2.600	6.350	-
Prior year Prod Dev no longer funded in the FYDP	Various	VARIOUS : VARIOUS	5.863	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	43.380	2.800		0.850		1.000		-		1.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
INC 2 A/C Software Integration	C/CPFF	BOEING : SEATTLE WA	30.519	0.000		0.000		0.000		-		0.000	0.000	30.519	30.519
INC 3 A/C Software Integration	TBD	TBD : TBD	0.000	0.000		1.500	Nov 2017	1.368	Nov 2018	-		1.368	0.000	2.868	-
Prior year Support cost no longer funded in the FYDP	Various	VARIOUS : VARIOUS	4.861	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	35.380	0.000		1.500		1.368		-		1.368	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Eval	Various	VARIOUS : VARIOUS	4.736	0.767	Nov 2016	0.644	Nov 2017	0.750	Nov 2018	-		0.750	Continuing	Continuing	Continuing
		Subtotal	4.736	0.767		0.644		0.750		-		0.750	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604261N / *Acoustic Search Sensors*	Project (Number/Name) 3224 / *High Altitude ASW*	

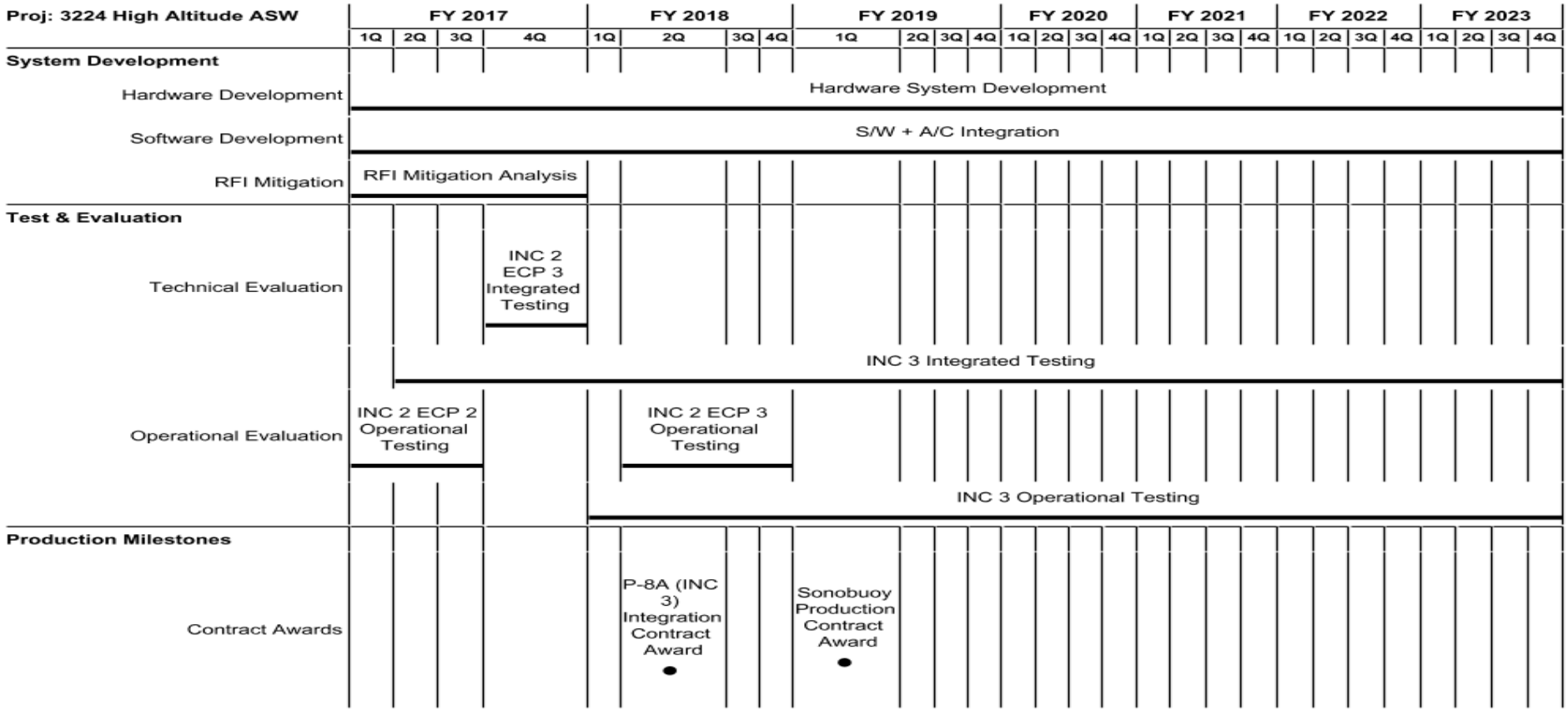
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Eng Spt	Various	VARIOUS : VARIOUS	3.122	0.200	Nov 2016	0.152	Nov 2017	0.200	Nov 2018	-		0.200	Continuing	Continuing	Continuing
Government Eng Spt	WR	NAWCAD : PATUXENT RIVER, MD	22.936	0.629	Nov 2016	0.598	Nov 2017	0.568	Nov 2018	-		0.568	Continuing	Continuing	Continuing
Travel	C/T&M	VARIOUS : VARIOUS	0.576	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Mngmt Svcs no longer funded in the FYDP	Various	VARIOUS : VARIOUS	3.013	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	29.647	0.829		0.750		0.768		-		0.768	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	113.143	4.396		3.744		3.886		-		3.886	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 3224 / *High Altitude ASW*



2019DON - 0604261N - 3224

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604261N / *Acoustic Search Sensors*	**Project (Number/Name)** 3224 / *High Altitude ASW*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj: 3224 High Altitude ASW				
System Development: Hardware Development: Hardware System Development	1	2017	4	2023
System Development: Software Development: Aircraft Software Development/ Integration	1	2017	4	2023
System Development: RFI Mitigation: RFI Mitigation Analysis	1	2017	4	2017
Test & Evaluation: Technical Evaluation: INC 2 ECP 3 Integrated Testing	4	2017	4	2017
Test & Evaluation: Technical Evaluation: INC 3 Integrated Testing	2	2017	4	2023
Test & Evaluation: Operational Evaluation: INC 2 ECP 2 Operational Testing	1	2017	3	2017
Test & Evaluation: Operational Evaluation: INC 2 ECP 3 Operational Testing	2	2018	4	2018
Test & Evaluation: Operational Evaluation: INC 3 Operational Testing	1	2018	4	2023
Production Milestones: Contract Awards: P-8A (INC 3) Integration Contract Award	2	2018	2	2018
Production Milestones: Contract Awards: Sonobuoy Production Contract Award	1	2019	1	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604262N / *V-22A*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	9,202.125	149.113	171.386	143.079	-	143.079	132.805	91.521	115.051	117.392	184.398	10,306.870
1425: *V-22*	9,202.125	149.113	171.386	143.079	-	143.079	132.805	91.521	115.051	117.392	184.398	10,306.870
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 212												

A. Mission Description and Budget Item Justification

The V-22 Osprey is an Acquisition Category IC Joint Program led by the Department of the Navy for the purpose of developing, testing, evaluating, procuring and fielding a tilt rotor, vertical takeoff and landing aircraft for Joint Service application. The V-22 program is designed to provide an aircraft to meet the amphibious/vertical assault needs of the Marine Corps, the Carrier Onboard Delivery (COD) needs of the Navy, and the special operations needs of the Air Force and the United States Special Operations Command (USSOCOM). The MV-22 variant is replacing the CH-46E and CH53A/D in the Marine Corps and the CMV-22 will replace the C-2A in the Navy. The CV-22 variant replaced the MH-53J and MH-53M and augments the C-130 in the Air Force and USSOCOM. The V-22 is capable of flying over 2,100 nautical miles, with a single refueling, giving the services the advantage of a Vertical/Short Take-off and Landing aircraft that can rapidly self-deploy to any location in the world. This program is funded under Engineering Manufacturing and Development for correction of deficiencies and includes Block A and Block B upgrades which encompassed engineering and manufacturing development of new end-items prior to the production incorporation decision as well as Block C suitability and effectiveness development upgrades. Capability Development Document interoperability requirements were addressed through a spiral upgrade acquisition strategy. It was the first spiral providing Key Enabling Department of Defense mandated open systems architecture upgrades for the mission computer hardware and software while simultaneously addressing required interoperability common avionics upgrades and current avionics obsolescence issues. Future development efforts will include Pre-Planned-Product-Improvements in the Capability Development Document and Re-design efforts to correct critical Reliability, Maintainability and Availability issues in support of readiness Operational Safety Improvement Program as prioritized by the United States Marine Corps or an Urgent Universal Needs Statement. Development efforts include Mission System Upgrade, Electrical System Upgrades, Engine Air Particle Separator (EAPS), Mid-Wing Process Unit, ARC 210 Series Radio, Mission Computer Obsolescence Initiative, Weapon Systems Development, Time on Wing, Digital Interoperability (DI), Blue Force Tracker/Netted Weather, Technology Insertion efforts such as: Swashplate Actuator, Infrared Suppressor, Modular Avionics Mission Computer Re-design, Center Console Re-design, Helmet Mounted Display and Multi-Spectral Sensor, Aircraft Mission Maneuvering Envelope Expansion and testing of Additive Manufacturing processes for selected MV-22 components.

The MV-22 Hardware Development Airframe continues to fund development efforts in support of MV-22 Block upgrades, Time on Wing and Safety Improvement efforts such as Cockpit Engine Health Indicator and gearbox vibration monitoring. Continue engineering, logistics, flight test, flight test support and address the correction of deficiencies and obsolescence. Continue MV-22 software development/mission computer obsolescence initiatives such as transition tech demo and modular avionics mission computer redesign. Continue V-22 integrated aircraft survivability equipment to include correcting deficiencies; radar warning system, integration with an upgraded missile warning and active infrared countermeasure system, and providing integrated threat warning information on the aircraft's main flight displays. Continue correcting deficiencies of the current EAPS and development of particle separation solutions. Continue Nacelle redesign efforts that will improve maintainability and reliability, as well as wiring redesign.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*

MV-22 Hardware Development Propulsion will continue to fund the flight/engine hours necessary for developmental testing at the Patuxent River squadron. Rolls-Royce will continue to provide engine support and development of MV-22 flight testing.

FY19 continues DI, United States Marine Corps Aviation wide implementation of software defined radios, such as Software Reprogrammable Payload, capable of migration to advanced waveforms and payloads, providing enhanced digital connectivity between forces using dissimilar waveforms and/or protocols. DI will enable fleet integration of new capability through the use of tablets with custom applications. DI is also envisioned to include logistics tracking (cargo and personnel) with the use of Radio Frequency Identification technology, advanced Electronic Warfare/Cyber capability, and threat data capturing/off-boarding.

FY19 continues the CMV-22 Hardware Development efforts which consist of an Engineering Change Proposal (ECP) to modify MV-22 into the CMV-22 configuration to perform the COD mission. The ECP will add such things as (1) the capability to meet the range requirements that the COD mission demands (2) a high frequency radio to transmit/receive beyond line of sight over water and (3) a public address system for use while transporting passengers. CMV will begin to support development efforts such as: Correcting deficiencies of the current swashplate actuator, EAPS, Electrical System Re-design, IRS Re-design, Center Console Re-design and Modular Avionics / Cyber Security Implementation.

FY19 continues the V-22 Aerial Refueling System (VARS) capability. VARS will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. The system will allow the V-22 to provide fuel to other Air Combat Element aircraft, such as F-35B, F-18, V-22 and CH-53E/K, while en-route, in the objective area, or during recovery, extending the operational reach/duration. With the V-22 deployed onboard, amphibious assault ships would gain an organic aerial refueling capability, maximizing response time and agility.

FY19 continues Electrical System re-design and reliability improvement efforts. This effort will assess and select engineering solutions to improve the Generator and Generator Control Unit components. Increased V-22 electrical system reliability and capacity is required to accommodate demands on electrical power system as additional systems are added to the V-22.

FY19 continues Infrared Suppressor (IRS) Re-design efforts. The IRS system masks the infrared signature of an aircraft, which increases the survivability. The current system does not meet reliability requirements and is a high readiness degrader for the V-22 fleet. This effort funds the Engineering & Manufacturing Development, as well as the instrumented flight test of a more reliable V-22 IRS upgrade.

FY19 continues V-22 Technology Insertion development efforts. These efforts provide new capabilities focused on enhancing survivability; software and hardware modularity and maturation of aircraft interfaces to support Cyber-Resilient interoperability. Also includes risk reduction and development efforts such as Modular Avionics/Cyber Security Implementation, Cyber / Safe Flight Controls improvements, Enhanced Defensive Weapons Capabilities, Radio Frequency Threat Protection and Airborne Networking.

FY19 continues V-22 Multi-Spectral Sensor / Helmet Mounted Display risk reduction and developmental efforts, started in the Technology Insertion line, for an improved Navigation Sensor (including added capabilities such as targeting designating and Degraded Visual Environment improvements) and a Helmet Mounted Display.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*

FY19 continues the V-22 Time on Wing effort, started in the Technology Insertion line, to redesign and correct the deficiencies on the current swashplate actuator to provide a fully qualified fatigue life component.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

Note: 1st 2 CMV production aircraft are test aircraft. They will be delivered to Patuxent River to support DT testing.
OT will be conducted as part of a carrier air wing work-up prior to deployment. OT testing will focus on assessing the effectiveness and suitability of the CMV-22 as the Carrier Onboard Delivery (COD) platform in the carrier strike group.
There is no Milestone C, because CMV-22 is being executed as an ECP to V-22 Block C. IOC for CMV-22 is FY-21.

Note: Cost to complete should be 194.589, and Total Cost should be 10,317.061. Both are correct on the R-3.

Note: The FY 2019 funding request was reduced by $2.268 million to account for the availability of prior year execution balances.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	189.423	171.386	137.814	-	137.814
Current President's Budget	149.113	171.386	143.079	-	143.079
Total Adjustments	-40.310	0.000	5.265	-	5.265
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.127	0.000			
• Program Adjustments	-15.000	0.000	6.863	-	6.863
• Rate/Misc Adjustments	0.000	0.000	-1.598	-	-1.598
• Congressional General Reductions Adjustments	-0.005	-	-	-	-
• Congressional Directed Reductions Adjustments	-20.178	-	-	-	-

Change Summary Explanation

1. CMV EDM Article Test was deleted as requirement is no longer needed. CMV schedule has been updated to include the Test Articles which are the first two aircraft off of the production line in FY20.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*

2. IRS - flight demo extended through 2Q18 due to aircraft availability. EMD contract award moved to 3Q19 to align with flight demo. IRS schedule updated to reflect NRE in lieu of DT/OT to reflect work being done on the EMD contract. It was mislabeled as DT/OT.
4. VARS IOC added 3Q19 as it was missing on the schedule. VARS DT/OT has been combined to reduce testing time and provide efficiency.
6. Tech Insertion BIC contract awards were deleted as effort is no longer being funded.

Technical: Not applicable

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604262N / *V-22A*				Project (Number/Name) 1425 / *V-22*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
1425: *V-22*	9,202.125	149.113	171.386	143.079	-	143.079	132.805	91.521	115.051	117.392	184.398	10,306.870
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 212

A. Mission Description and Budget Item Justification

The V-22 Osprey is an Acquisition Category IC Joint Program led by the Department of the Navy for the purpose of developing, testing, evaluating, procuring and fielding a tilt rotor, vertical takeoff and landing aircraft for Joint Service application. The V-22 program is designed to provide an aircraft to meet the amphibious/vertical assault needs of the Marine Corps, the Carrier Onboard Delivery (COD) needs of the Navy, and the special operations needs of the Air Force and the United States Special Operations Command (USSOCOM). The V-22 is replacing the CH-46E and CH53A/D in the Marine Corps with the MV-22; will supplement the H-60 in the Navy with the MV-22; and replace the MH-53J and MH-53M as well as augment the C-130 in the Air Force and USSOCOM with the CV-22. The V-22 is capable of flying over 2,100 nautical miles, with a single refueling, giving the services the advantage of a Vertical/Short Take-off and Landing aircraft that can rapidly self-deploy to any location in the world. This program is funded under Engineering Manufacturing and Development for correction of deficiencies and includes Block A and Block B upgrades which encompassed engineering and manufacturing development of new end-items prior to the production incorporation decision as well as Block C suitability and effectiveness development upgrades. Capability Development Document interoperability requirements were addressed through a spiral upgrade acquisition strategy. It was the first spiral providing Key Enabling Department of Defense mandated open systems architecture upgrades for the mission computer hardware and software while simultaneously addressing required interoperability common avionics upgrades and current avionics obsolescence issues. Future development efforts will include Pre-Planned-Product-Improvements in the Capability Development Document and Re-design efforts to correct critical Reliability, Maintainability and Availability issues in support of readiness Operational Safety Improvement Program as prioritized by the United States Marine Corps or a Urgent Universal Needs Statement. Development efforts include Mission System Upgrade, Electrical System Upgrades, Engine Air Particle Separator (EAPS), Mid-Wing Process Unit, ARC 210 Series Radio, Mission Computer Obsolescence Initiative, Weapon Systems Development, Time on Wing, Digital Interoperability (DI), Blue Force Tracker/Netted Weather, Technology Insertion such as: Swashplate Actuator, Infrared Suppressor, Modular Avionics Mission Computer Re-design, Center Console Re-design, Helmet Mounted Display and Multi-Spectral Sensor, Aircraft Mission Maneuvering Envelope Expansion and testing of Additive Manufacturing processes for selected MV-22 components.

The MV-22 Hardware Development Airframe continues to fund development efforts in support of MV-22 Block upgrades, Time on Wing and Safety Improvement efforts such as Cockpit Engine Health Indicator and gearbox vibration monitoring. Continue engineering, logistics, flight test, flight test support and address the correction of deficiencies and obsolescence. Continue MV-22 software development/mission computer obsolescence initiatives such as transition tech demo and modular avionics mission computer redesign. Continue V-22 integrated aircraft survivability equipment to include correcting deficiencies; radar warning system, integration with an upgraded missile warning and active infrared countermeasure system, and providing integrated threat warning information on the aircrafts main flight displays. Continue correcting deficiencies of the current EAPS and development of particle separation solutions. Continue Nacelle redesign efforts that will improve maintainability and reliability, as well as wiring redesign.

MV-22 Hardware Development Propulsion will continue to fund the flight/engine hours necessary for developmental testing at the Patuxent River squadron. Rolls-Royce will continue to provide engine support and development of MV-22 flight testing.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

FY19 continues V-22 DI, United States Marine Corps Aviation wide implementation of software defined radios, such as Software Reprogrammable Payload, capable of migration to advanced waveforms and payloads, providing enhanced digital connectivity between forces using dissimilar waveforms and/or protocols. DI will enable fleet integration of new capability through the use of tablets with custom applications. DI is also envisioned to include logistics tracking (cargo and personnel) with the use of Radio Frequency Identification technology, advanced Electronic Warfare/Cyber capability, and threat data capturing.

FY19 continues the CMV-22 Hardware Development efforts which consist of an Engineering Change Proposal (ECP) to modify MV-22 into the CMV configuration to perform the Carrier Onboard Delivery (COD) mission. The ECP will add such things as (1) the capability to meet the range requirements that the COD mission demands (2) a high frequency radio to transmit/receive beyond line of sight over water and (3) a public address system for use while transporting passengers. CMV will begin to support development efforts such as: Correcting deficiencies of the current swashplate actuator, EAPS, Electrical System Re-design, IRS Re-design, Center Console Re-design and Modular Avionics / Cyber Security Implementation.

FY19 continues the V-22 Aerial Refueling System (VARS) capability. VARS will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. The system will allow the V-22 to provide fuel to other Air Combat Element aircraft, such as F-35B, F-18, V-22 and CH-53E/K, while en-route, in the objective area, or during recovery, extending the operational reach/duration. With the V-22 deployed onboard, amphibious assault ships would gain an organic aerial refueling capability, maximizing response time and agility.

FY19 continues Electrical System re-design and reliability improvement efforts. This effort will assess and select engineering solutions to improve the Generator and Generator Control Unit components. Increased V-22 electrical system reliability and capacity is required to accommodate demands on electrical power system as additional systems are added to the V-22.

FY19 continues Infrared Suppressor (IRS) Re-design efforts. The IRS system masks the infrared signature of an aircraft, which increases the survivability. The current system does not meet reliability requirements and is a high readiness degrader for the V-22 fleet. This effort funds the Engineering & Manufacturing Development, as well as the instrumented flight test of a more reliable V-22 IRS upgrade.

FY19 continues V-22 Technology Insertion development efforts. These efforts provide new capabilities focused on enhancing survivability; software and hardware modularity and maturation of aircraft interfaces to support Cyber-Resilient interoperability. Also includes risk reduction and development efforts such as Modular Avionics/Cyber Security Implementation, Cyber/Safe Flight Controls improvements, Enhanced Defensive Weapons Capabilities, Radio Frequency Threat Protection and Airborne Networking.

FY19 continues V-22 Multi-Spectral Sensor / Helmet Mounted Display risk reduction and developmental efforts, started in the Technology Insertion line, for an improved Navigation Sensor (including added capabilities such as targeting designating and Degraded Visual Environment improvements) and a Helmet Mounted Display.

FY19 continues the V-22 Time on Wing effort, started in the Technology Insertion line, to redesign and correct the deficiencies on the current swashplate actuator to provide a fully qualified fatigue life component.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal year.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: MV-22 Hardware Development Airframe	16.636	16.827	15.145	0.000	15.145
Articles:	-	-	-	-	-

Description: The MV-22 Hardware Development Airframe continues to fund development efforts. Continue development in support of MV-22 Block upgrades, electrical system capacity efforts, Time on Wing/Reliability Improvements efforts such as testing of Additive Manufacturing processes for selected MV-22 components and Safety Improvement efforts such as Cockpit Engine Health Indicator (CEHI) and gearbox vibration monitoring. Continue engineering, logistics, flight test, flight test support and address the correction of deficiencies and obsolescence. Continue MV-22 software development/sustainment efforts such as transition tech demo and Modular Avionics Mission Computer Obsolescence Initiative re-design. Continue V-22 integrated aircraft survivability equipment to include correcting deficiencies; radar warning system, integration with an upgraded missile warning and active infrared countermeasure system, cockpit interface units, electrical power system, and providing integrated threat warning information on the aircraft main flight displays. Continue correcting deficiencies of the current EAP's and development of particle separation solutions. Continue Nacelle redesign efforts that will improve maintainability and reliability, as well as wiring redesign.

FY 2018 Plans:
Continue MV-22 development efforts. Continue MV-22 software development/sustainment efforts such as Mission Computer Obsolescence Initiative re-design. Continue development in support of MV-22 Block upgrades and Time on Wing/Reliability Improvement efforts such as Improved Inlet Solution. Continue engineering, logistics, flight test, flight test support and address correction of deficiencies and obsolescence efforts such as Swashplate Actuator, Engine Air Particle Separator, also including training upgrades and developments. Continue reliability improvement efforts such as Additive manufacturing, and Miniaturized Airborne Global Positioning as well as Re-design efforts to correct critical Reliability, Maintainability and Availability issues in support of readiness Operational Safety Improvement Program.

FY 2019 Base Plans:
Continue MV-22 development efforts. Continue MV-22 software development/sustainment efforts. Continue development in support of MV-22 Block upgrades, Time on Wing/Reliability Improvements such as testing of Additive Manufacturing processes for selected MV-22 components and Safety Improvement efforts such as CEHI and gearbox vibration monitoring. Continue engineering, logistics, flight test, flight test support and address correction of deficiencies and obsolescence efforts such as Engine Air Particle Separator, also including training upgrades and developments. Continue reliability improvement efforts as well as Re-design efforts to

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604262N / *V-22A*	Project (Number/Name) 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
correct critical Reliability, Maintainability and Availability issues in support of readiness Operational Safety Improvement Program. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.682M from FY-18 to FY-19 for Hardware Development is due to design changes to the Improved Inlet Solution (IIS) program.					
Title: MV-22 Hardware Development Propulsion/Mission Care ***Articles:*** ***Description:*** The funding of Mission Care relates to our RDT&E program as it funds the flight/engine hours necessary for developmental testing at the Patuxent River squadron. In addition, it pays for Rolls Royce engine support at Patuxent River. ***FY 2018 Plans:*** Funds continued for Mission Care flight & engine hours for developmental testing at Patuxent River squadron. ***FY 2019 Base Plans:*** Funds continues for Mission Care flight & engine hours for developmental testing at Patuxent River squadron. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $1.545M from FY-18 to FY-19 for Hardware Development Propulsion / Mission Care is due to increased Developmental Testing for particle separation and engine hardware and software improvements.	0.162 -	0.167 -	1.712 -	0.000 -	1.712 -
Title: MV-22 Digital Interoperability ***Articles:*** ***Description:*** Digital Interoperability (DI) is the United States Marine Corps Aviation wide implementation of iridium and software defined radios, such as Software Reprogrammable Payload (SRP), capable of migration to advanced waveforms and payloads, providing enhanced digital connectivity between forces using dissimilar waveforms and/or protocols. DI will enable fleet integration of new capability through the use of tablets with custom applications. DI is also envisioned to include logistics tracking (cargo and personnel) with the use of	9.900 -	12.200 -	22.839 -	0.000 -	22.839 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Radio Frequency Identification technology, advanced Electronic Warfare/Cyber capability, and threat data capturing/off-boarding. ***FY 2018 Plans:*** Funds continued for the maturation of Digital Interoperability and assessment of effectiveness via gateway messaging, data flow, data assurance, and quality of service to support the Information Exchange Requirements to support the approved integrated aviation survivability equipment information systems Initial Capability Document, distributed electronic warfare operations, data fusion, off-boarding, and mission thread Information exchange Requirements across the range of military operations. ***FY 2019 Base Plans:*** Funds continues for the maturation of Marine Air Ground Task Force (MAGTF) Agile Network Gateway Link (MANGL). This includes Digital Interoperability and assessment of effectiveness via gateway messaging, data flow, data assurance, and quality of service to support the Information Exchange Requirements to support the approved integrated aviation survivability equipment information systems Initial Capability Document, distributed electronic warfare operations, data fusion, and mission thread Information exchange Requirements across the range of military operations. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $10.639M from FY-18 to FY-19 for Digital Interoperability is due to the Software Reprogrammable Payload being combined with the Digital Interoperability effort in FY-19, and increase in Developmental Testing requirements.					
Title: MV-22 Software Reprogrammable Payload (SRP) ***Articles:*** ***Description:*** SRP is a single common payload module that is open architecture, government owned, flexible, and reconfigurable to support simultaneous missions and applications making maximum use of available bandwidth and ensuring interoperability. Provides a bridge and translator to allow various systems/waveforms to collaborate and provides the V-22 operator and passenger with a common operating picture. ***FY 2018 Plans:*** Funding continued for SRP gateway development to provide for Digital Interoperability via Sensor Fusion and Integrated Aircraft Survivability Equipment. Continuation of waveform development of Spiral II waveforms (Link	6.000 -	6.000 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
16, Bandwidth Efficient Common Data Link, Tactical Targeting Network Technology and associated hardware into the SRP radio. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $6.0M from FY-18 to FY-19 for Software Reprogrammable Payload (SRP) is due to the combining of the SRP line into the Digital Interoperability line beginning in FY-19.					
Title: V-22 CMV Development	59.636	65.185	23.634	0.000	23.634
Articles:	1	-	-	-	-
Description: Funding supports the implementation of an Engineering Change Proposal (ECP) to incorporate the new systems required for the CMV configuration to perform the Carrier Onboard Delivery (COD) mission. The ECP will add (1) the capability to meet the range requirements that the COD mission demands (2) a High Frequency radio to transmit/receive beyond line of sight over water and (3) a Public Address system for use while transporting passengers. Continue CMV-22 integrated aircraft survivability equipment to include correcting deficiencies of the current swashplate actuator, EAPS, radar warning system, integration with an upgraded missile warning and active infrared countermeasure system, and providing integrated threat warning information on the aircrafts main flight displays. ***FY 2018 Plans:*** Continued funding for the V-22 CMV Development effort to perform the COD mission. Support the development of Functional Test Plans and qualification efforts for the High Frequency radio to transmit/receive beyond line of sight over water and the Public Address system for use while transporting passengers. Development of the Joint Vertical Experimental Application System Software will continue. Begin tooling design and fabrication for the enlarged sponsons and wing tanks and the completion of the live fire test sponson fabrication will occur. Begin risk reduction flight testing and develop the logistics products. Begin the test Instrumentation design and planning for the CMV aircraft. ***FY 2019 Base Plans:*** Continues funding for the V-22 CMV Development effort to perform the COD mission. Support the development of Functional Test Plans for the High Frequency (HF) radio to transmit/receive beyond line of sight over water					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
and the Public Address (PA) system. Development of the Joint Vertical Experimental Application System Software (JASS) will continue. Continue Modular Avionics software development / sustainment efforts such as Mission Computer obsolescence initiative redesign and modular software. Continue developmental efforts such as swashplate actuator, electrical system re-design, EAPS, IRS re-design and Cyber Security implementation. Begin the test instrumentation design and planning for the CMV aircraft. Begin Carrier Suitability and Integration testing and will complete developmental test risk reduction activities on PA system and HF radio and begin Alternate Live Fire Test and Evaluation development activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $41.551M from FY-18 to FY-19 for CMV Development is in accordance with planned program execution. Development efforts decrease as program moves into Production phase.					
Title: V-22 Aerial Refueling System Development	16.501	17.323	10.615	0.000	10.615
Articles:	-	-	-	-	-
Description: V-22 Aerial Refueling System (VARS) will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. The system will allow the V-22 to provide fuel to other Air Combat Element aircraft, such as F-35B, F-18, V-22 and CH-53E/K, while en-route, in the objective area, or during recovery, extending the operational reach/duration. With the V-22 deployed onboard, amphibious assault ships would gain an organic aerial refueling capability, maximizing response time and agility. ***FY 2018 Plans:*** Continued funding for the VARS Development Capability. VARS will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. The FY18 funding will be used to continue flight testing and supply engineering support for any issues identified during flight test as well as the procurement of additional flight test kits. ***FY 2019 Base Plans:*** Continues funding for the VARS Development Capability. VARS will provide V-22 tanker capability to the Marine Air Ground Task Force, enabling safe and efficient execution of all missions, tactical or humanitarian. The FY19					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604262N / *V-22A*	Project (Number/Name) 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
funding will be used to supply engineering support for any issues identified during flight test and initial fleet deployment as well as continued support equipment development and delivery. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $6.708M from FY-18 to FY-19 for V-22 Aerial Refueling System Development is in accordance with planned program execution.					
Title: MV-22 Electrical System Re-design	5.200	8.200	6.964	0.000	6.964
Articles:	-	-	-	-	-
Description: Continue Electrical System re-design and reliability improvement efforts. This effort will assess and select engineering solutions to improve the Generator and Generator Control Unit (GCU) components as well as support relocation of the GCU. Upgrading the increased V-22 electrical system reliability and capacity is required to accommodate demands on electrical power system as additional systems are added to the V-22. Nacelle redesign will accommodate Inlet Solution wiring and remote Variable Frequency Generator and Generator Control Unit (VFG/GCU) provisions. Will accommodate Inlet Solution Wiring and remote Variable Frequency Generator (VFG), Constant Frequency Generator (CFG) and Generator Control Unit (GCU) provisions. ***FY 2018 Plans:*** Continued Electrical System re-design and reliability improvement effort started in the hardware development line. This effort is a two phase approach; first phase will redesign and separate the GCUs (both VFG and CFG) from the generators and relocate them to a more benign environment (such as the fuselage); second phase will redesign VFG/GCU to one common configuration increasing power generation capacity required to accommodate demands on electrical power system as additional systems are added to the V-22. Continue Nacelle redesign efforts that will improve maintainability and reliability, as well as wiring redesign. ***FY 2019 Base Plans:*** Continues Electrical System re-design and reliability improvement efforts noting the revised Acquisition strategy that will redesign and replace only the CFG GCU without relocating the GCU. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Decrease of $1.236M from FY-18 to FY-19 reflects the revised FY-19 program plan to redesign and replace the CFG GCU versus relocating it.					
Title: V-22 Infrared Suppressor (IRS) Re-design	8.694	10.578	8.162	0.000	8.162
Articles:	-	-	-	-	-
Description: Funding supports the development of a new or improved Infrared Suppressor (IRS) system for the V-22. The IRS system masks the infrared signature of an aircraft which increases the survivability. The current system does not meet reliability requirements and is a high readiness degrader for the V-22 fleet. This funding will provide for Engineering & Manufacturing Development and instrumented flight test of a more reliable V-22 IRS upgrade. ***FY 2018 Plans:*** Funding continued for the development of a new IRS system for the V-22. The IRS system masks the infrared signature of an aircraft which increases the survivability. FY18 funding will provide for continued Engineering & Manufacturing Development of upgraded IRS system. ***FY 2019 Base Plans:*** Funding continues for the development of a new IRS system for the V-22. The IRS system masks the infrared signature of an aircraft which increases the survivability. FY19 funding will provide for continued Engineering & Manufacturing Development of an upgraded IRS system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $2.416M from FY-18 to FY-19 is in accordance with planned program execution, and is due to completion of a Down Select Analysis of Alternatives to a Single Solution contract award.					
Title: MV-22 Technology Insertion	5.641	11.072	7.575	0.000	7.575
Articles:	-	-	-	-	-
Description: The V-22 Technology Insertion development effort will provide new capabilities focused on enhancing survivability; software and hardware modularity and maturation of aircraft interfaces to support interoperability. Tech Insertion includes risk reduction and development efforts such as Modular Avionics/Cyber Security Implementation, Enhanced Defensive Weapons Capabilities, Radio Frequency Threat Protection, and Airborne Networking.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: FY18 Technology Insertion funding provided for efforts to include risk reduction and development efforts such as Multi-Spectral Sensor Integration, including Improved Forward Looking Infrared, Degraded Visual Environment Mitigation, Electronic Warfare, Helmet Mounted Display, Modular Avionics/Cyber Security Implementation, Enhanced Defensive Weapons Capabilities, Improved Survivability (Radio Frequency Threat Protection) and Airborne Networking. ***FY 2019 Base Plans:*** FY19 continues V-22 Technology Insertion development efforts at various vendors. This effort provides new capabilities focused on enhancing survivability; software and hardware modularity and maturation of aircraft interfaces to support Cyber-Resilient Interoperability. Also includes risk reduction and development efforts such as Modular Avionics / Cyber Security Implementation, Cyber / Safe Flight Controls Improvements, Enhanced Defensive Weapons Capabilities, Radio Frequency Threat Protection and Airborne Networking. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $3.497M from Technology Insertion is due to Multi-Spectral Sensor / Helmet Mounted Display and Swashplate Actuator being broken out separately in R-2a Accomplishments.					
Title: V-22 Development Support, Test and Evaluation	20.743	23.834	25.995	0.000	25.995
Articles:	-	-	-	-	-
Description: Fund Government Engineering, Contractor Engineering, including Follow-On Test Evaluation (FOT&E), Developmental Test & Engineering (DT&E), and Operational Test & Evaluation (OT&E) for the V-22 flight events. Perform Government oversight. Execute test program risk reduction efforts, as well as fund Tactical Training Theatre Assessment and Planning Phase III program to ensure that all Navy training and testing at sea is compliant with the major Federal environmental laws. ***FY 2018 Plans:*** Funds provided for continued support of FOT&E, DT&E and OT&E to include flight control software, vehicle system operating software, inlet distortion, APR-39D(V)2, structural fatigue, envelope expansion, software airframe loads,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
nacelle sails, integrated aircraft survivability equipment, Nacelle Sail testing, traffic collision avoidance system, bonded tabs, aerial refueling system and refueling envelope, Tactical Training Theatre Assessment and Planning Phase III and CMV risk reduction. ***FY 2019 Base Plans:*** Funds provided for continues support of FOT&E, DT&E and OT&E to include flight control software, vehicle system operating software, inlet distortion, APR-39D(V)2, structural fatigue, envelope expansion, software airframe loads, nacelle sails, integrated aircraft survivability equipment, Nacelle Sail testing, Traffic Collision Avoidance System, Bonded Tabs, Aerial Refueling System and Refueling Envelope, Tactical Training Theatre Assessment and Planning Phase III and CMV risk reduction. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $2.161M from FY-18 to FY-19 in Development Support, Test and Evaluation reflects developmental testing requirements for CMV Aircraft.					
Title: Multi-Spectral Sensor / Helm Mounted Display	0.000	0.000	10.591	0.000	10.591
Articles:	-	-	-	-	-
Description: The V-22 Multi-Spectral Sensor / Helmet Mounted Display will provide risk reduction and developmental efforts for an improved Navigation Sensor and a Helmet Mounted Display. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** FY19 continues the V-22 Multi-Spectral Sensor/Helmet Mounted Display risk reduction and developmental efforts started in the Technology Insertion line for an improved Navigation Sensor (including added capabilities such as targeting designating and Degraded Visual Environment improvements) and a Helmet Mounted Display. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase of $10.591M from FY-18 to FY-19 for Multi-Spectral Sensor / Helmet Mounted Display due to the effort starting under the Technology Insertion line and continuing under an individual line. New schedule has been added					
Title: Swashplate Actuator redesign	0.000	0.000	9.847	0.000	9.847
Articles:	-	-	-	-	-
Description: The V-22 Time on Wing effort, started in the Technology Insertion line, will redesign and correct the deficiencies on the current swashplate actuator to provide a fully qualified fatigue life component. FY2018 began the engineering analysis and design. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** FY19 funding continues the V-22 Time on Wing effort for to redesign and correct the deficiencies on the current swashplate actuator to provide a fully qualified fatigue life component. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $9.847M from FY-18 to FY-19 for Swashplate Actuator redesign is due to the effort starting under the Technology Insertion line and continuing under an individual line. New schedule has been added.					
Accomplishments/Planned Programs Subtotals	149.113	171.386	143.079	0.000	143.079

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN 0164: *V-22*	1,534.476	697.078	833.759	-	833.759	1,150.174	1,013.617	1,189.725	1,642.807	2,433.055	37,706.776
• APN 0590: *V-22 Series*	249.072	228.321	214.820	-	214.820	328.288	326.507	516.116	544.466	3,301.006	6,872.403
• APN 0605/J0164: *V-22 Inital Spares*	0.000	1.897	3.744	-	3.744	2.797	64.827	50.126	51.346	Continuing	Continuing
• RDTE 1160403BB: *CV-22 Special Operations, Aviation Systems*	15.590	14.259	21.635	-	21.635	28.462	8.500	8.000	18.000	0.000	117.439
• RDTE BA07 0401318F: *CV-22 USAF BA07*	28.702	22.519	16.641	-	16.641	14.731	14.985	15.293	0.000	41.970	219.360

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The MV-22 is a post Milestone III ACAT-IC program. As a result of mishaps during and subsequent to MV-22 Operational Evaluation (Apr and Dec 00), the program was restructured employing a phased approach to return to flight and tactical introduction. The Contractor and Government defined deficient areas within the program/ aircraft requiring correction prior to return to flight. A Block Upgrade approach was planned, with required efforts identified in Block "A", "B", and "C". Block "A" included those efforts necessary to return the V-22 to safe and operational fleet operations. Block "B" included those efforts necessary to improve the effectiveness and suitability of the aircraft. Block "C" includes mission enhancements like weather radar, cabin effectiveness suitability improvements, i.e., Environmental Control System, and Forward Firing ALE-47. Non-recurring development activities are to be initiated and completed for all efforts identified in Block "A", "B", and "C". The Contractor will develop specific Statements of Work and Preliminary Specification Change Notices required to integrate the Block Upgrade efforts into the baseline Program. A Systems Requirements Review, Initial Design Review, and Final Design Review was held for each of the Block efforts so the design maturity could be reviewed and the Government could redirect activities as appropriate. The CV-22 Engineering Manufacturing and Development program is also structured in Blocks to define an evolutionary approach to achieving full operational capability. Block "0" is the initial baseline CV-22 variant. Block "10" enhances mission capability with the addition of terrain following radar, additional fuel tanks, additional radios, and Block "20" includes capabilities such as radio frequency and infrared countermeasures improvements. Additional Blocks are in the planning stages to continue the growth process throughout the operational life of the weapon system. The Government will issue an RFP to the Contractor and upon award, an Integrated Baseline Review, Preliminary Design Review, Integrated Logistics Assessment and a Critical Design Review will be held to assess the design maturity of the CMV-22. The CMV-22 will add (1) the capability to meet the range requirements that the Carrier Onboard Delivery (COD) mission demands (2) a high frequency radio to transmit/receive beyond line of sight over water and (3) a public address system for use while transporting passengers in support of the COD mission.

E. Performance Metrics

Milestone Reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MV-22 Hardware Dev Airframe	SS/CPIF	Various : Various	81.144	16.636	Jan 2017	16.827	Jan 2018	15.145	Jan 2019	-		15.145	129.474	259.226	259.226
MV-22 Hardware Dev Propulsion	SS/CPIF	Rolls-Royce Corp. : Indianapolis, IN	196.547	0.162	Nov 2016	0.167	Nov 2017	1.712	Nov 2018	-		1.712	2.125	200.713	200.713
V-22 Digital Interoperability	WR	Various : Various	11.138	9.900	Jan 2017	12.200	Jan 2018	22.839	Mar 2019	-		22.839	10.000	66.077	66.077
V-22 Software Reprogrammable Payload (SRP)	WR	NRL : China Lake, CA	5.200	6.000	Jan 2017	6.000	Jan 2018	0.000		-		0.000	0.000	17.200	17.200
CMV-22 Development	C/CPIF	Bell Boeing : Ridley Park, PA	16.084	59.636	Nov 2016	65.185	Nov 2017	23.634	Nov 2018	-		23.634	37.994	202.533	202.533
V-22 Aerial Refueling System Development	SS/CPIF	Bell Boeing : Ridley Park, PA	10.800	16.501	Jan 2017	17.323	Jan 2018	10.615	Dec 2018	-		10.615	15.210	70.449	70.449
V-22 Electrical System Re-Design	C/BA	Bell Boeing : Ridley Park, PA	0.000	5.200	Dec 2016	8.200	Dec 2017	6.964	Mar 2019	-		6.964	91.105	111.469	111.469
V-22 IRS Re-design	C/BA	Various : Various	0.960	8.694	Dec 2016	10.578	Jan 2018	8.162	Jan 2019	-		8.162	24.028	52.422	52.422
V-22 Tech Insertion	C/CPFF	Various : Various	2.658	5.641	Nov 2016	11.072	Mar 2018	7.575	Mar 2019	-		7.575	124.829	151.775	151.775
Multi-Spectral Sensor / Helmet Mounted Display	C/CPIF	Bell Boeing : Ridley Park, PA	0.000	0.000		0.000		10.591	Mar 2019	-		10.591	41.979	52.570	52.570
Swashplate Actuator	C/CPIF	Bell Boeing : Ridley Park, PA	0.000	0.000		0.000		9.847	May 2019	-		9.847	26.623	36.470	40.468
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	5,106.472	0.000		0.000		0.000		-		0.000	0.000	5,106.472	-
		Subtotal	5,431.003	128.370		147.552		117.084		-		117.084	503.367	6,327.376	N/A

Remarks

Flight Testing begins for Digital interoperability FY18 to FY19 - Increase in Flight Testing requirements. CMV-22 received a Congressional Mark of $11.927M in FY17, therefore reducing FY17 from $71.563M to $59.636M. VARS received a Congressional Mark of $8.251M in FY17, therefore reducing FY17 from $24.752M to $16.501M. Electric System redesign of the Generators to one Common Configuration increasing power generation capacity increases cost in FY18. Technology Insertion Risk Reduction and Developmental efforts such as Multi-Spectral Sensor Integration, Helmet Mounted Display, Improved Survivability and Airborne Networking increases funding in FY18 to support an improved Navigation Sensor and Cyber Security

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604262N / *V-22A*	Project (Number/Name) 1425 / *V-22*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MV-22 Govt Engineering Sppt	WR	Various : Pax River, MD	1,109.492	2.829	Nov 2016	2.887	Nov 2017	2.750	Nov 2018	-		2.750	24.769	1,142.727	-
CMV-22 Govt Engineering Sppt	WR	Various : Pax River, MD	0.820	1.189	Nov 2016	1.298	Nov 2017	1.131	Nov 2018	-		1.131	3.527	7.965	-
Prior Year Support no longer funded in the FYDP	Various	Various : Various	189.718	0.000		0.000		0.000		-		0.000	0.000	189.718	-
		Subtotal	1,300.030	4.018		4.185		3.881		-		3.881	28.296	1,340.410	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MV-22 Dev Test & Evaluation	WR	NAWCAD : Pax River, MD	1,041.383	13.455	Nov 2016	6.699	Nov 2017	6.940	Nov 2018	-		6.940	59.220	1,127.697	-
MV-22 Operational Test & Evaluation	WR	OT&E Force : Norfolk, VA	56.856	1.362	Dec 2016	1.476	Dec 2017	2.521	Dec 2018	-		2.521	23.006	85.221	-
CMV-22 Dev Test & Evaluation	WR	NAWCAD : Pax River, MD	0.000	0.000		9.100	Nov 2017	10.236	Nov 2018	-		10.236	10.280	29.616	-
Prior Year T & E no longer funded in the FYDP	Various	Various : Various	48.200	0.000		0.000		0.000		-		0.000	0.000	48.200	-
		Subtotal	1,146.439	14.817		17.275		19.697		-		19.697	92.506	1,290.734	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MV-22 Engineering Tech Sppt	Various	Various : Various	1,047.602	0.257	Nov 2016	0.259	Nov 2017	0.264	Dec 2018	-		0.264	6.350	1,054.732	-
MV-22 Management Sppt Svc	Various	Various : Various	157.551	0.674	Nov 2016	0.681	Nov 2017	0.695	Jan 2019	-		0.695	6.918	166.519	-
MV-22 Program Mgmt Support	WR	NAWCAD : Pax River, MD	61.676	0.795	Nov 2016	0.800	Nov 2017	0.816	Nov 2018	-		0.816	10.741	74.828	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604262N / *V-22A*	Project (Number/Name) 1425 / *V-22*	

Management Services ($ in Millions)

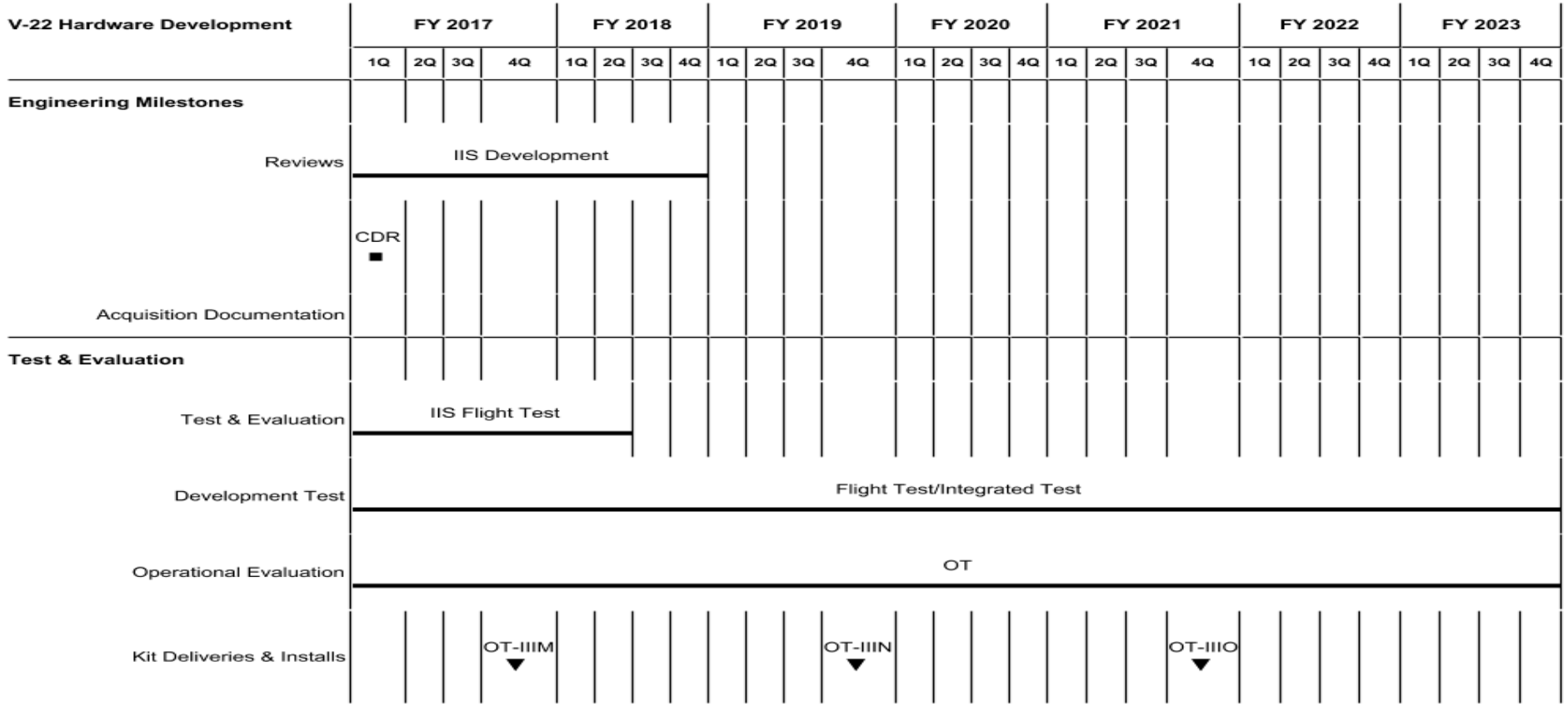
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MV-22 Travel	WR	Various : Various	16.737	0.182	Jan 2017	0.185	Sep 2018	0.185	Sep 2019	-		0.185	2.300	19.589	-
CMV-22 Travel	WR	Various : Various	0.000	0.000		0.040	Sep 2018	0.040	Sep 2019	-		0.040	0.080	0.160	-
CMV-22 Engineering Tech Sppt	Various	Various : Various	0.000	0.000		0.409	Jan 2018	0.417	Jan 2019	-		0.417	0.800	1.626	-
Prior Year Mgmt Svcs no longer funded in the FYDP	Various	Various : Various	41.087	0.000		0.000		0.000		-		0.000	0.000	41.087	-
		Subtotal	1,324.653	1.908		2.374		2.417		-		2.417	27.189	1,358.541	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9,202.125	149.113		171.386		143.079		-		143.079	651.358	10,317.061	N/A

Remarks

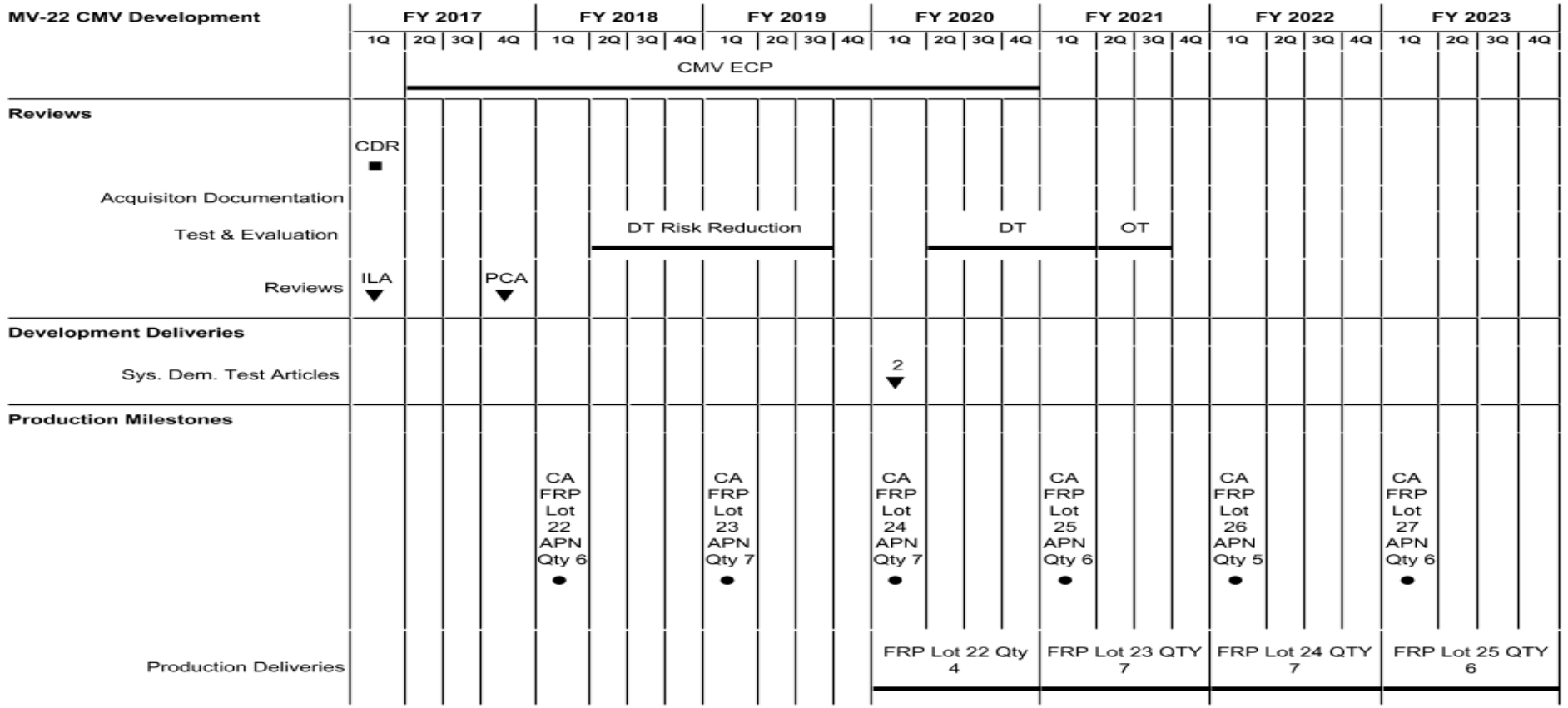
R-3 reflects correct CTC and Total Cost.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*



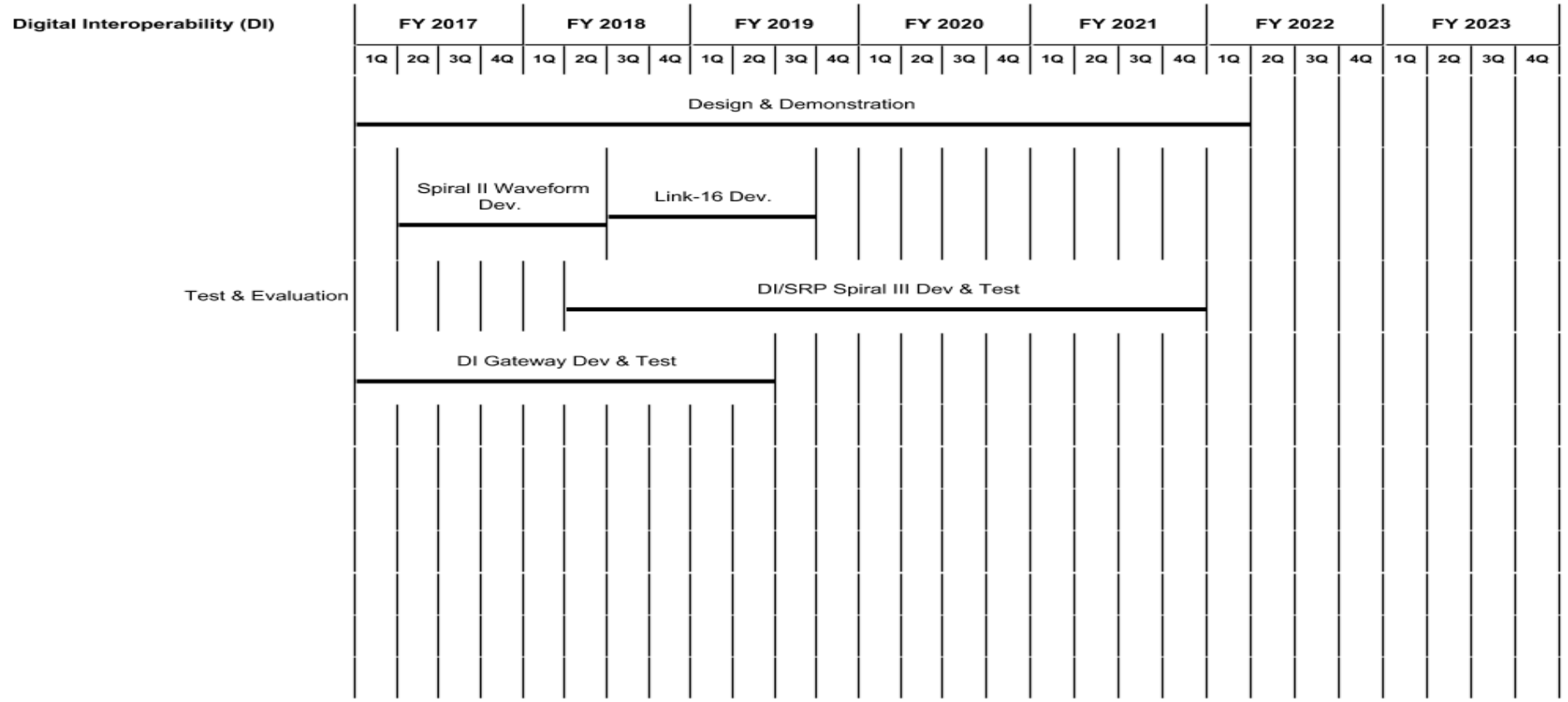
2019PB - 0604262N - 1425

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*



2019PB - 0604262N - 1425

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*



2019PB - 0604262N - 1425

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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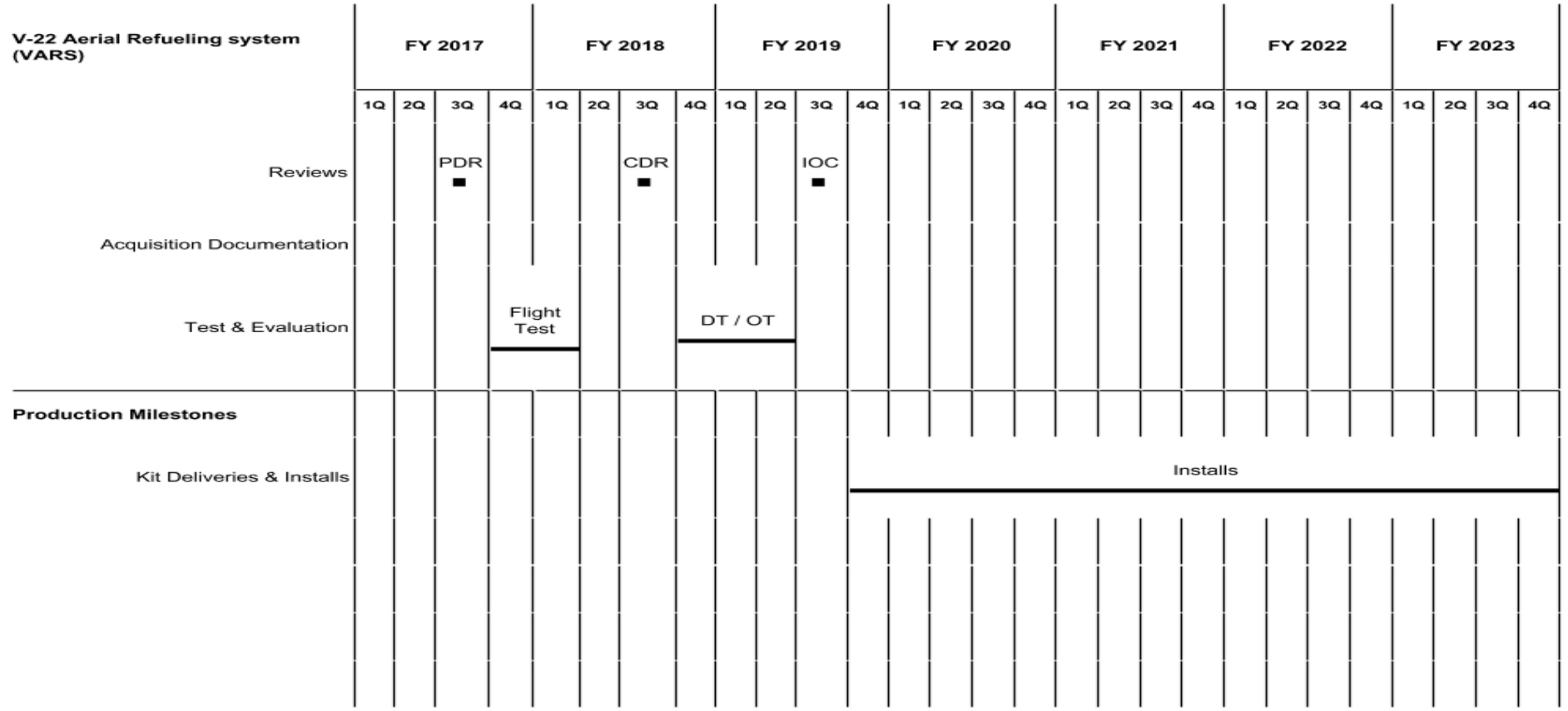

2019PB - 0604262N - 1425

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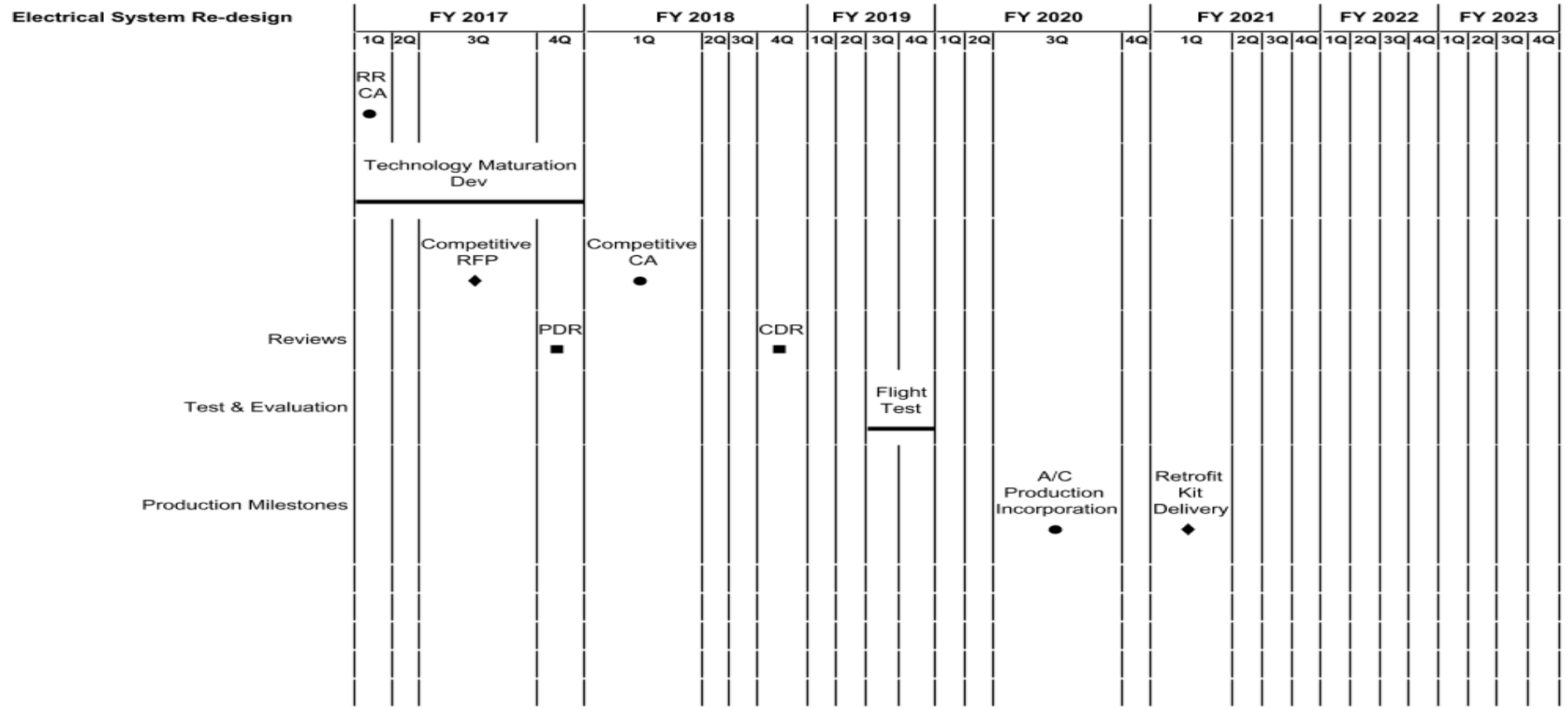
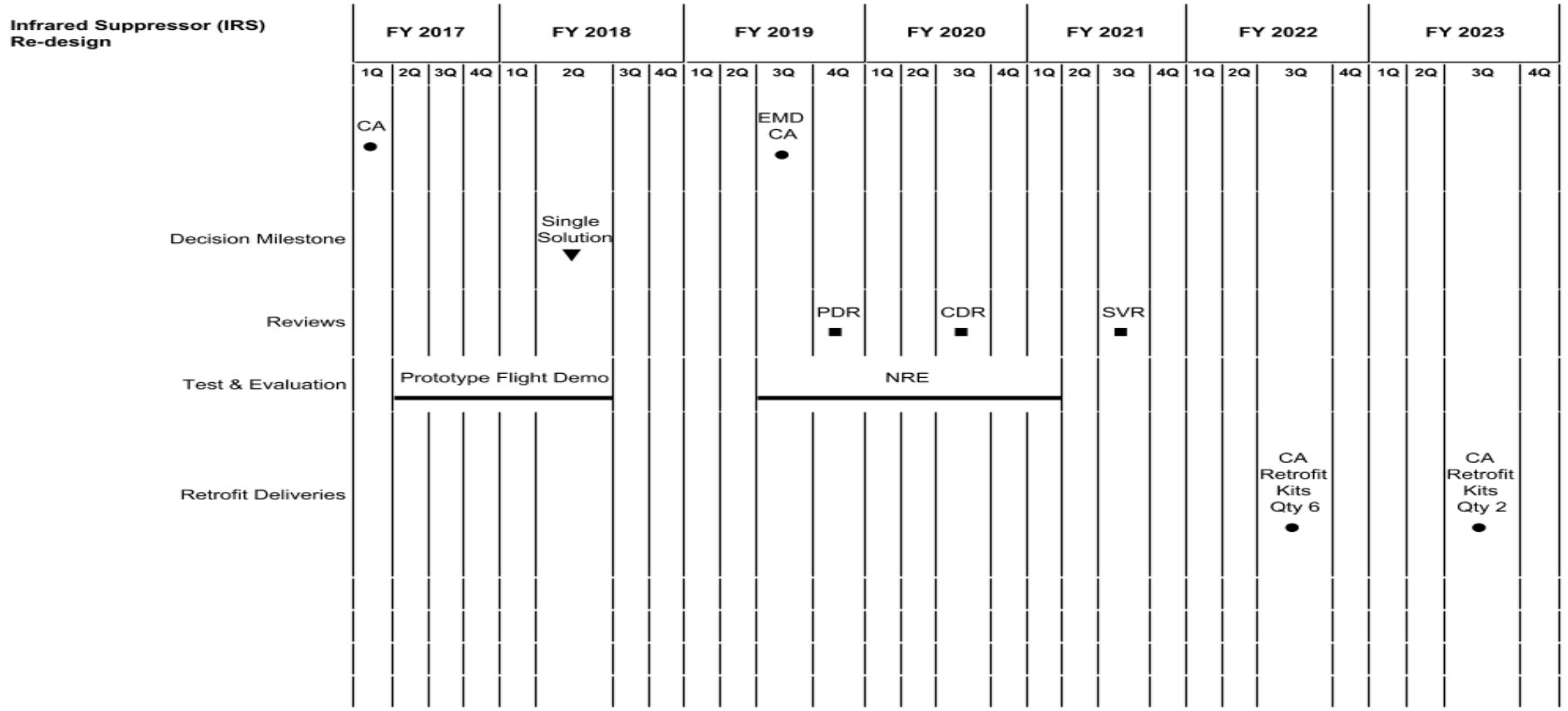


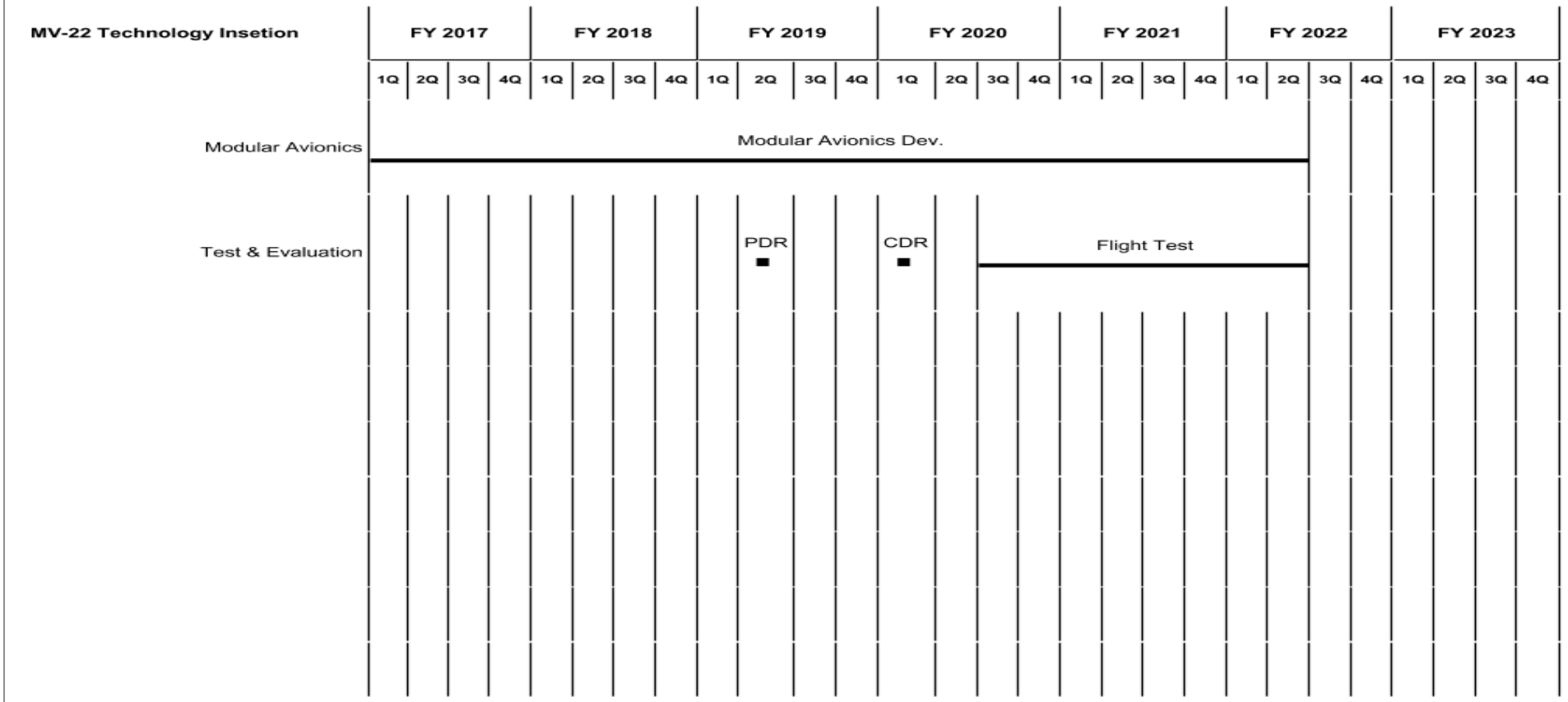
2019PB - 0604262N - 1425

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*



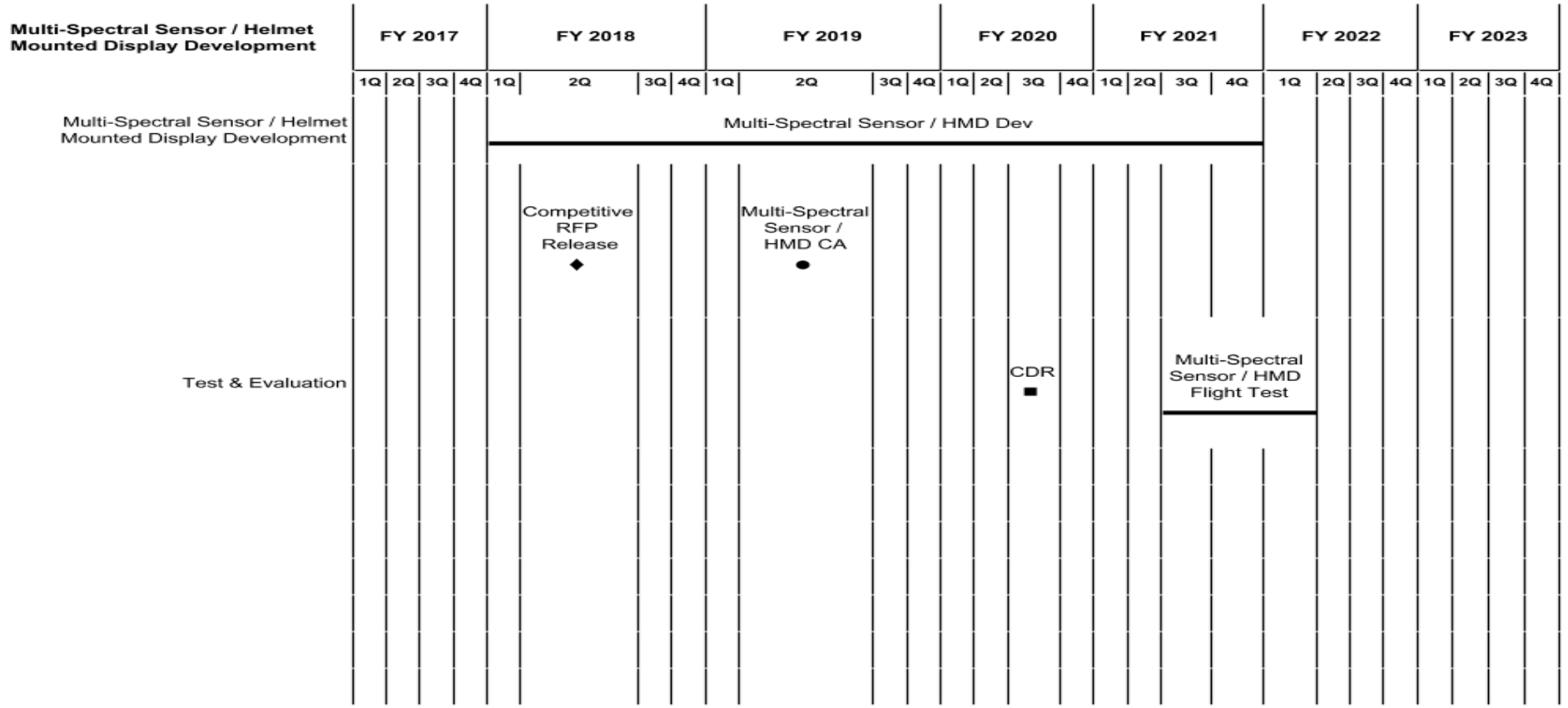
2019PB - 0604262N - 1425

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*



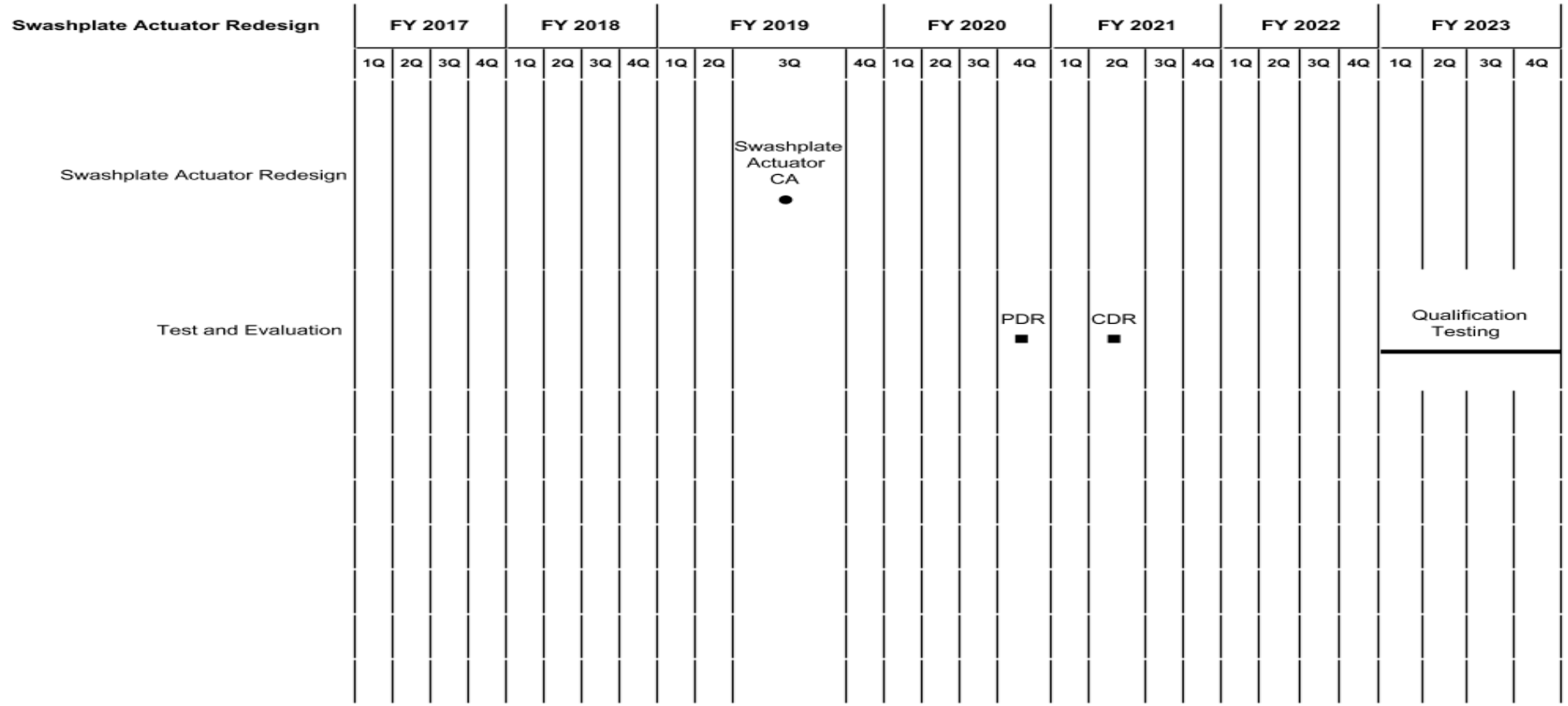
2019PB - 0604262N - 1425

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*



2019PB - 0604262N - 1425

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*



2019PB - 0604262N - 1425

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
V-22 Hardware Development				
Engineering Milestones: Reviews: Improved Inlet Solution - Contract Award/ Development effort	1	2017	4	2018
Engineering Milestones: Reviews: Critical Design Review	1	2017	1	2017
Test & Evaluation: Test & Evaluation: IIS Flight Test	1	2017	2	2018
Test & Evaluation: Development Test: Development Flight Test / Integrated Test (IT-IIID) & Continuous software sustainment developmental testing	1	2017	4	2023
Test & Evaluation: Operational Evaluation: Operational Testing	1	2017	4	2023
Test & Evaluation: Kit Deliveries & Installs: Operational Testing (OT-IIIM)	4	2017	4	2017
Test & Evaluation: Kit Deliveries & Installs: Operational Testing (OT-IIIN)	4	2019	4	2019
Test & Evaluation: Kit Deliveries & Installs: Operational Testing (OT-IIIO)	4	2021	4	2021
MV-22 CMV Development				
Engineering Change Proposal	2	2017	4	2020
Reviews: Critical Design Review	1	2017	1	2017
Reviews: Test & Evaluation: Developmental Test Risk Reduction	2	2018	3	2019
Reviews: Test & Evaluation: Developmental Test	2	2020	1	2021
Reviews: Test & Evaluation: Operational Test	2	2021	3	2021
Reviews: Reviews: Integrated Logistics assessment	1	2017	1	2017
Reviews: Reviews: Physical Configuration Audit	4	2017	4	2017
Development Deliveries: Sys. Dem. Test Articles: Sys. Dem. Test Articles	1	2020	1	2020
Production Milestones: Lot 22 APN MV22 CMV Qty 6	1	2018	1	2018
Production Milestones: Lot 23 APN MV22 CMV Qty 7	1	2019	1	2019
Production Milestones: Lot 24 APN MV22 CMV Qty 7	1	2020	1	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Lot 25 APN MV22 CMV Qty 6	1	2021	1	2021
Production Milestones: Lot 26 APN MV22 CMV Qty 5	1	2022	1	2022
Production Milestones: Lot 27 APN MV22 CMV Qty 6	1	2023	1	2023
Production Milestones: Production Deliveries: Lot 22 APN CMV Qty 4	1	2020	4	2020
Production Milestones: Production Deliveries: Lot 23 APN CMV Qty 7	1	2021	4	2021
Production Milestones: Production Deliveries: Lot 24 APN CMV Qty 7	1	2022	4	2022
Production Milestones: Production Deliveries: Lot 25 APN CMV Qty 6	1	2023	4	2023
Digital Interoperability (DI)				
System Design & Demonstration	1	2017	1	2022
SRP Spiral II Waveform Dev.	2	2017	2	2018
Link-16 Dev./ntegration	3	2018	3	2019
Test & Evaluation: DI/SRP Spiral III Deveopment and Test	2	2018	4	2021
Test & Evaluation: DI Gateway Development & Test	1	2017	2	2019
V-22 Aerial Refueling system (VARS)				
Reviews: Preliminary Design Review	3	2017	3	2017
Reviews: Critical Design Review	3	2018	3	2018
Reviews: Initial Operational Capability	3	2019	3	2019
Test & Evaluation: Prototype Test	4	2017	1	2018
Test & Evaluation: Developmental Testing / Operational Testing	4	2018	2	2019
Production Milestones: Kit Deliveries & Installs: Installs	4	2019	4	2023
Electrical System Re-design				
Risk Reduction Contract Award	1	2017	1	2017
Technology Maturation Development	1	2017	4	2017
Competitive RFP	3	2017	3	2017
Competitive Contract Award	1	2018	1	2018
Reviews: Preliminary Design Review	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Reviews: Critical Design Review	4	2018	4	2018
Test & Evaluation: Flight Test	3	2019	4	2019
Production Milestones: Aircraft Production Incorporation	3	2020	3	2020
Production Milestones: Retrofit Kit Delivery	1	2021	1	2021
Infrared Suppressor (IRS) Re-design				
Phase I Contract Awards	1	2017	1	2017
EMD Contract Award	3	2019	3	2019
Decision Milestone: Single Solution	2	2018	2	2018
Reviews: Preliminary Design Review	4	2019	4	2019
Reviews: Critical Design Review	3	2020	3	2020
Reviews: System Verification Review	3	2021	3	2021
Test & Evaluation: Prototype Flight Demonstrations	2	2017	2	2018
Test & Evaluation: Non-Recurring Engineering	3	2019	1	2021
Retrofit Deliveries: IRS Kits Qty 6 Contract Award	3	2022	3	2022
Retrofit Deliveries: IRS Kits Qty 2	3	2023	3	2023
MV-22 Technology Insetion				
Modular Avionics: Modular Avionics Deveopment	1	2017	2	2022
Test & Evaluation: Preliminary Design Review	2	2019	2	2019
Test & Evaluation: Modular Avionics Critical Design Review	1	2020	1	2020
Test & Evaluation: Modular Avionics Critical Flight Test	3	2020	2	2022
Multi-Spectral Sensor / Helmet Mounted Display Development				
Multi-Spectral Sensor / Helmet Mounted Display Development: Multi-Spectral Sensor / Helmet Mounted Display Development	1	2018	4	2021
Multi-Spectral Sensor / Helmet Mounted Display Development: Competitive RFP Release	2	2018	2	2018
Multi-Spectral Sensor / Helmet Mounted Display Development: Multi-Spectral Sensor / Helmet Mounted Display Development CA	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604262N / *V-22A*	**Project (Number/Name)** 1425 / *V-22*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation: Critical Design Review	3	2020	3	2020
Test & Evaluation: Flight Test	3	2021	1	2022
Swashplate Actuator Redesign				
Swashplate Actuator Redesign: Swashplate Actuator CA	3	2019	3	2019
Test and Evaluation: Preliminary Design Review	4	2020	4	2020
Test and Evaluation: Critical Design Review	2	2021	2	2021
Test and Evaluation: Qualification Testing	1	2023	4	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604264N *I Air Crew Systems Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	126.971	8.746	13.235	20.980	-	20.980	20.380	19.764	3.086	3.045	Continuing	Continuing
0606: *Aircrew System Development*	126.971	8.746	13.235	20.980	-	20.980	20.380	19.764	3.086	3.045	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Aircrew Systems Development program provides Engineering and Manufacturing Development of Aviation Life Support Systems to protect aircrew and flight deck personnel from current and future threats including: directed energy weapons, chemical/biological/radiological agents/fallout, ballistic projectiles, temperature extremes, heat/fire, low concentration oxygen environments, high dynamic forces during emergency egress, hearing loss, and high "G" forces. The program also provides development for the following capabilities: night vision capability, hearing and head protection, aircrew endurance, aircrew performance, man mounted data display, communications, clothing, in flight restraint and stability emergency egress and descent, escape and evasion, survival and rescue, crash protection, and anthropometric sizing for small aircrew. Acquisition initiatives include: competition, the application of streamlining initiatives, use of non-developmental items, joint and tri-service developments, and the pursuit of NATO/allied cooperative ventures, which expedite introduction of new products into Navy and Marine Corps fixed and rotary wing aircraft, reduce costs, and promote commonality.

JUSTIFICATION FOR BUDGET ACTIVITY:
This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	13.577	13.235	18.697	-	18.697
Current President's Budget	8.746	13.235	20.980	-	20.980
Total Adjustments	-4.831	0.000	2.283	-	2.283
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.400	0.000			
• SBIR/STTR Transfer	-0.131	0.000			
• Program Adjustments	0.000	0.000	2.700	-	2.700
• Rate/Misc Adjustments	0.000	0.000	-0.417	-	-0.417
• Congressional Directed Reductions Adjustments	-6.100	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604264N *I Air Crew Systems Development*

Change Summary Explanation

Schedule:

1. Acquisition Milestones:
A. Laser Eye Protection (LEP) - Milestone B (MS B), Milestone C (MS C), Initial Operational Capability (IOC) and Full Rate Production (FRP) delayed due to extended revision of threat requirement and decision not to procure United States Air Force (USAF) spectacle.

B. Enhanced Visual Acuity (EVA) - MS B and MS C dates changed to reflect revised schedule.

2. System Development:
A. LEP - System Readiness Review 1 moved from 4Q FY15 to 1Q FY17; System Function Review/System Readiness Review 2 moved from 2Q FY17 to 1Q FY18; Critical Design Review moved from 1Q FY18 to 2Q FY19; Test Readiness Review moved from 2Q FY18 to 4Q FY19; System Verification Review/ Production Readiness Review moved from 2Q FY19 to 2Q FY21; Physical Configuration Audit moved from 2Q FY20 to 1Q FY22.

B. EVA - Moved Preliminary Design Review from 1Q FY17 to 2Q FY19; moved Critical Design Review from 4Q FY17 to 1Q FY20; moved Test Readiness Review from 3Q FY18 to 1Q FY21; moved System Verification Review/Production Readiness Review from 3Q FY19 to 1Q FY22.

3. Test and Evaluation:
A. LEP - Developmental Test shifted from 4Q FY18 to 1Q FY20.

B. EVA - Developmental Test shifted from 3Q FY18 to 3Q FY20; Operational Test shifted from 2Q FY20 to 3Q FY22.

4. Production Milestones:
A. LEP - Engineering Development Model (EDM), Low Rate Initial Production (LRIP) and Full Rate Production (FRP) contract award dates changed to align with milestone decisions.

B. EVA - EDM, LRIP 1 and LRIP 2 contract award dates changed to align with milestone decisions.

5. Deliveries:
A. Laser Eye Protection Spectacles (LEP) - Engineering Development Model (EDM) quantity changed from 62 to 91; Low Rate Initial Production (LRIP) 1 quantity changed from 550 to 350; Full Rate Production (FRP) 1 quantity changed from 665 to 535.

B. Enhanced Visual Acuity (EVA) - EDM quantity changed from 25 to 12; LRIP 1 quantity changed from 6 to 25 and LRIP 2 quantity changed from 64 to 100.

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604264N / *Air Crew Systems Development*	Project (Number/Name) 0606 / *Aircrew System Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0606: *Aircrew System Development*	126.971	8.746	13.235	20.980	-	20.980	20.380	19.764	3.086	3.045	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

AIRCREW SYSTEMS: Laser Eye Protection (LEP), Enhanced Visual Acuity (EVA), and Aircrew Systems (AS).

Under the above projects, LEP provides eye protection solutions that will provide Fixed, Rotary Wing and Patrol pilots and aircrew with multiple wavelength fixed threat and hazard protection during day and night unaided and Night Vision Goggle aided missions. LEP will consist of a suite of products to include spectacles, goggles and visors. The LEP (visor, spectacle or goggle format) is being developed for compatibility with all required USN/USMC Aviation Life Support Equipment as well as cockpit displays, night vision and fire control systems. EVA provides advanced night vision/Head Up Display (HUD) capability to address critical capability gaps in low and no light illumination levels (night vision). EVA will be integrated on current aircraft through a common interface allowing incremental, modular approach to fielding full capability and future upgrades. Future increments will provide enhanced aircrew situational awareness in degraded visual environment. Aircrew Systems includes State of the Art (SOA) and Survival Systems which provides for the yearly evaluation of the survival, clothing and other aircrew systems that provide upgraded performance, fill capability gaps, improve aircrew endurance and performance, safety and enhance survivability.

AIRCRAFT SYSTEMS: Aircraft Systems include studies for Advanced Crash Protection, SOA, and Survival Systems. SOA provides for the yearly evaluation of the survival systems that provide upgraded performance, improve endurance, fill capability gaps and improve performance, safety and enhance survivability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Aircrew System Development	8.245	10.938	18.405	0.000	18.405
Articles:	-	-	-	-	-
Description: Laser Eye Protection (LEP) provides Spectacles (both Self Protection and Multi-Wavelength), goggles, step-in visor and Laser Eye Protection Improvement Program (LEPIP) which monitors emerging threats and changes to technology. Enhanced Visual Acuity (EVA) provides advanced night vision/Head Up Display (HUD) capability to address critical capability gaps in low and no light illumination (Night Vision). Future increments will provide enhanced visibility in degraded visual environments. AS includes SOA.					
FY 2018 Plans: Laser Eye Protection (LEP): Continue research and development of the next increment of threat spectacle, complete System Readiness Review 2 (SRR2).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604264N / *Air Crew Systems Development*	**Project (Number/Name)** 0606 / *Aircrew System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Enhanced Visual Acuity (EVA): Continue development, award Engineering, Demonstration and Manufacturing contract and receive Milestone B Decision. State of the Art (SOA): Continue a yearly evaluation and authorization of the survival, clothing, and other aircrew systems items. Identification, testing and approval of items that provide upgraded performance, fill capability gaps, improve aircrew endurance, improve aircrew performance and safety and enhance survivability. Physiological Episode Protection: Mitigate risk of loss of aircrew and Tactical and Training jet platforms due to Physiological Episodes using monitoring and alert systems. Develop, prototype, and test a physiological monitoring system that detects physiological episodes and provides a warning in time to enable the aircrew to execute emergency procedures and recover safely. ***FY 2019 Base Plans:*** Laser Eye Protection (LEP): Continue research and development of the next increment of threat spectacle, complete Critical Design Review (CDR), complete Technical Readiness Review (TRR), and deliver 91 Engineering Development Models (EDM). Enhanced Visual Acuity (EVA): Continue development and complete Preliminary Design Review (PDR). State of the Art (SOA): Continue a yearly evaluation and authorization of the survival, clothing, and other aircrew systems items. Identification, testing and approval of items that provide upgraded performance, fill capability gaps, improve aircrew endurance, improve aircrew performance and safety and enhance survivability. Physiological Episode Protection: Mitigate risk of loss of aircrew and Tactical and Training jet platforms due to Physiological Episodes using monitoring and alert systems. Develop, prototype, and test a physiological monitoring system that detects physiological episodes and provides a warning in time to enable the aircrew to execute emergency procedures and recover safely. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2018 to FY2019 Increase due to Enhanced Visual Acuity (EVA) Engineering and Manufacturing Development (EMD) Contract.					
Title: Aircraft Systems Development	0.501	2.297	2.575	0.000	2.575
Articles:	-	-	-	-	-
Description: Aircraft Systems include studies for Advanced Crash Protection, and State of the Art (SOA).					
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604264N / *Air Crew Systems Development*	**Project (Number/Name)** 0606 / *Aircrew System Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
State of the Art (SOA): Continue a yearly evaluation and authorization to include identification, testing and approval of items that provide upgraded performance, fill capability gaps, improve endurance, improve performance and safety and enhance survivability. Oxygen Cart (Peculiar Support Equipment (PSE)): The Emergency Oxygen Source (EOS) in the F/A-18 Navy Aircrew Common Ejection Seat (NACES) survival kit will be changed to afford the pilot more emergency oxygen in the event of a hypoxia incidence. This change will drive a requirement for PSE O2 servicing cart used to service the EOS cylinder. This part of the effort will develop, prototype and test an oxygen cart to reach the pressures required. ***FY 2019 Base Plans:*** State of the Art (SOA): Continue a yearly evaluation and authorization to include identification, testing and approval of items that provide upgraded performance, fill capability gaps, improve endurance, improve performance and safety and enhance survivability. Oxygen Cart (Peculiar Support Equipment (PSE)): The Emergency Oxygen Source (EOS) in the F/A-18 Navy Aircrew Common Ejection Seat (NACES) survival kit will be changed to afford the pilot more emergency oxygen in the event of a hypoxia incidence. This change will drive a requirement for PSE O2 servicing cart used to service the EOS cylinder. This part of the effort will develop, prototype and test an oxygen cart to reach the pressures required. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Accomplishments/Planned Programs Subtotals	8.746	13.235	20.980	0.000	20.980

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/4268: *Aviation Life Support*	15.028	39.867	16.070	-	16.070	28.904	29.827	45.400	46.153	Continuing	Continuing
• APN/0575: *Aviation Life Support Mods*	0.000	0.000	15.864	-	15.864	38.346	38.491	4.773	5.871	48.221	171.934

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604264N / *Air Crew Systems Development*	**Project (Number/Name)** 0606 / *Aircrew System Development*

D. Acquisition Strategy

Commercial Off-The-Shelf /Non-Developmental Items where possible, cost type contracts.

E. Performance Metrics

Enhanced Visual Acuity: Performance Metrics to include Preliminary Design Review (PDR), Critical Design Review (CDR), Milestone B (MS B), Milestone C (MS C) and IOC.

Laser Eye Protection: Performance Metrics to include System Readiness Review (SRR), Critical Design Review (CDR), Test Readiness Review (TRR), System Verification Review/Production Readiness Review (SVR/PRR), Milestone B (MS B), Milestone C (MS C), Initial Operating Capability (IOC) and Full Rate Production Decision Review (FRPDR).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604264N / *Air Crew Systems Development*	**Project (Number/Name)** 0606 / *Aircrew System Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Eng Laser Eye Protection (LEP)	WR	NAWCAD : Patuxent River, MD	8.648	1.398	Feb 2017	1.191	Dec 2017	1.070	Dec 2018	-		1.070	Continuing	Continuing	Continuing
Systems Eng Laser Eye Protection (LEP)	C/FFP	NAVAIR : Patuxent River, MD	0.000	0.573	Sep 2017	1.572	Mar 2018	0.420	Mar 2019	-		0.420	3.035	5.600	5.600
Systems Eng Aircrew Systems	WR	Various : Various	13.495	2.938	Feb 2017	1.224	Feb 2018	0.525	Feb 2019	-		0.525	Continuing	Continuing	Continuing
Systems Eng Aircraft Systems	WR	Various : Various	44.479	0.501	Feb 2017	1.374	Feb 2018	0.635	Feb 2019	-		0.635	Continuing	Continuing	Continuing
Systems Eng Aircraft Systems	SS/FFP	USAF : WPAFB, OH	0.156	0.000		0.000		0.000		-		0.000	0.000	0.156	-
System Eng Enhanced Visual Acuity	C/CPFF	Various : Various	3.120	0.592	Mar 2017	2.496	May 2018	11.677	Mar 2019	-		11.677	Continuing	Continuing	Continuing
System Eng Enhanced Visual Acuity	WR	Various : Patuxent River, MD	9.348	2.699	Feb 2017	2.539	Feb 2018	2.796	Feb 2019	-		2.796	Continuing	Continuing	Continuing
Systems Eng Physiological Episode Protection	C/CPFF	TBD : TBD	0.000	0.000		1.870	Nov 2017	1.870	Nov 2018	-		1.870	Continuing	Continuing	Continuing
Systems Eng O2 Cart	C/CPFF	NAWCAD : Lakehurst, NJ	0.000	0.000		0.923	Feb 2018	1.940	Feb 2019	-		1.940	Continuing	Continuing	Continuing
Prior year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	34.569	0.000		0.000		0.000		-		0.000	0.000	34.569	-
		Subtotal	113.815	8.701		13.189		20.933		-		20.933	Continuing	Continuing	N/A

Remarks

Electronic Knee Board (EKB) funding realigned to PE 0605215N starting in FY17.
FY18 funding received ($4.208M) in support of Enhanced Emergency Oxygen Supply (EEOS) and Physiological Episode (PE) Protection.
FY17 BTR received ($1.4M) in support of MH-60 Gunner Seat effort under State of the Art Aircrew Systems budget line.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604264N / *Air Crew Systems Development*	Project (Number/Name) 0606 / *Aircrew System Development*	

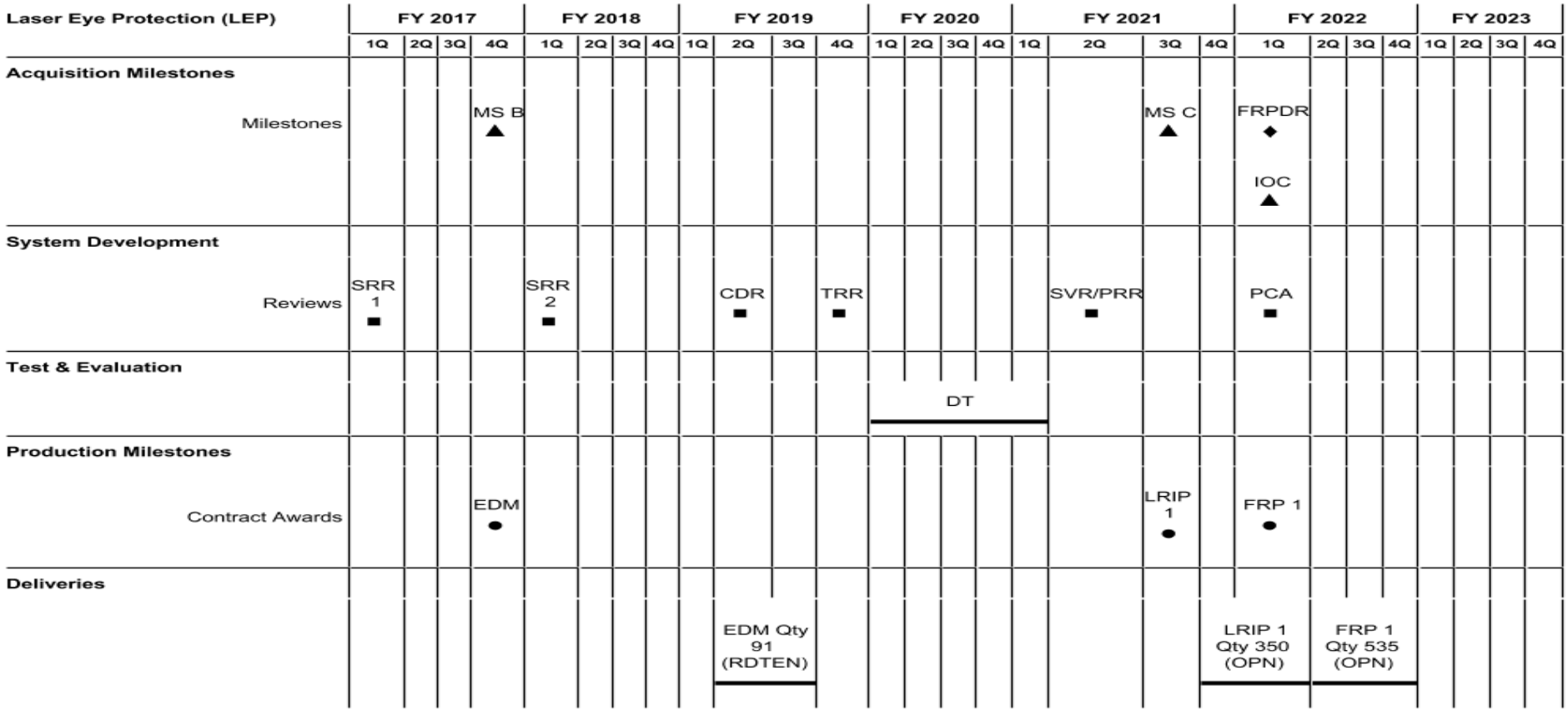
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	Various : Various	1.233	0.045	Dec 2016	0.046	Dec 2017	0.047	Dec 2018	-		0.047	Continuing	Continuing	Continuing
Prior year Mgmt Svcs no longer funded in the FYDP	Various	Various : Various	11.923	0.000		0.000		0.000		-		0.000	0.000	11.923	-
		Subtotal	13.156	0.045		0.046		0.047		-		0.047	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	126.971	8.746		13.235		20.980		-		20.980	Continuing	Continuing	N/A

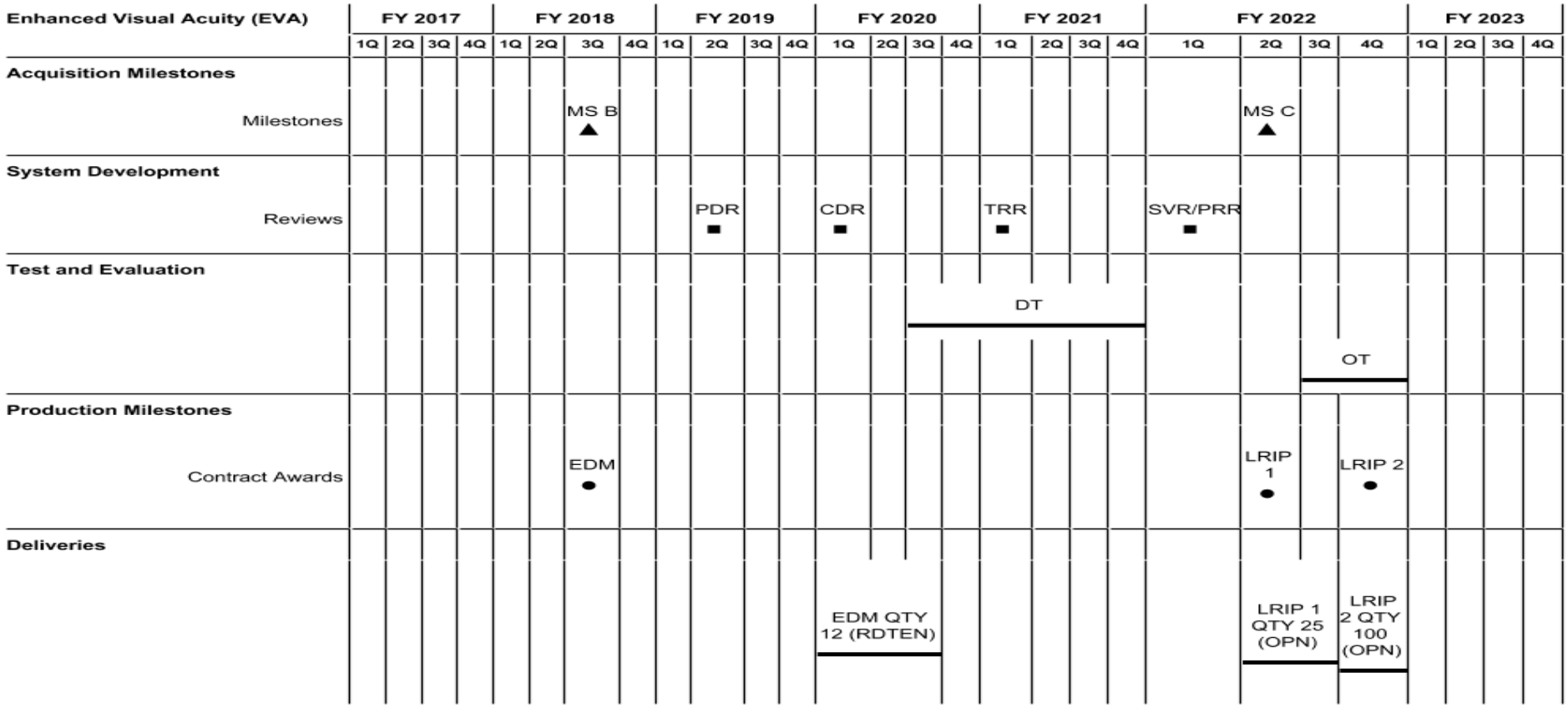
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604264N / *Air Crew Systems Development*	**Project (Number/Name)** 0606 / *Aircrew System Development*



2019DON - 0604264N - 0606

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604264N / *Air Crew Systems Development*	**Project (Number/Name)** 0606 / *Aircrew System Development*



2019DON - 0604264N - 0606 EDM Units will be used for Operational Testing

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604264N / *Air Crew Systems Development*	**Project (Number/Name)** 0606 / *Aircrew System Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Laser Eye Protection (LEP)				
Acquisition Milestones: Milestones: LEP Milestone B	4	2017	4	2017
Acquisition Milestones: Milestones: LEP: Milestone C	3	2021	3	2021
Acquisition Milestones: Milestones: LEP: FRP Decision	1	2022	1	2022
Acquisition Milestones: Milestones: LEP IOC	1	2022	1	2022
System Development: Reviews: SRR 1	1	2017	1	2017
System Development: Reviews: SRR 2	1	2018	1	2018
System Development: Reviews: CDR	2	2019	2	2019
System Development: Reviews: TRR	4	2019	4	2019
System Development: Reviews: SVR/PRR	2	2021	2	2021
System Development: Reviews: PCA	1	2022	1	2022
Test & Evaluation: DT	1	2020	1	2021
Production Milestones: Contract Awards: LEP EDM (RDTEN)	4	2017	4	2017
Production Milestones: Contract Awards: LEP LRIP 1 (OPN)	3	2021	3	2021
Production Milestones: Contract Awards: LEP FRP 1 (OPN)	1	2022	1	2022
Deliveries: LEP EDM Qty 91	2	2019	3	2019
Deliveries: LEP LRIP Qty 350	4	2021	1	2022
Deliveries: LEP FRP 1 Qty 535	2	2022	4	2022
Enhanced Visual Acuity (EVA)				
Acquisition Milestones: Milestones: EVA Milestone B	3	2018	3	2018
Acquisition Milestones: Milestones: EVA Milestone C	2	2022	2	2022
System Development: Reviews: EVA PDR	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604264N / *Air Crew Systems Development*	**Project (Number/Name)** 0606 / *Aircrew System Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: Reviews: EVA CDR	1	2020	1	2020
System Development: Reviews: EVA TRR	1	2021	1	2021
System Development: Reviews: EVA SVR/PRR	1	2022	1	2022
Test and Evaluation: EVA Developmental Testing	3	2020	4	2021
Test and Evaluation: EVA Operational Testing	3	2022	4	2022
Production Milestones: Contract Awards: EDM (RDTEN)	3	2018	3	2018
Production Milestones: Contract Awards: EVA LRIP 1 (OPN)	2	2022	2	2022
Production Milestones: Contract Awards: EVA LRIP 2 (OPN)	4	2022	4	2022
Deliveries: EDM (QTY 12)	1	2020	3	2020
Deliveries: EVA LRIP 1 (QTY 25)	2	2022	3	2022
Deliveries: EVA LRIP 2 (QTY 100)	4	2022	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604269N *I EA-18 Squadrons*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,879.537	100.825	173.488	147.419	-	147.419	159.472	159.966	129.280	108.238	Continuing	Continuing
3063: *EA-18G Development*	1,879.537	100.825	173.488	147.419	-	147.419	159.472	159.966	129.280	108.238	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 378												

A. Mission Description and Budget Item Justification

The EA-18G has replaced the EA-6B aircraft as the primary Electronic Attack platform supporting the Navy and Marine Corps. The EA-18G will be the sole EA aircraft in the inventory. Capabilities of the EA-18G weapon system and ancillary equipment can be upgraded to accommodate and incorporate new or enhanced weapons as well as advances in technology to respond effectively to emerging future threats. E/A-18G "Flight Plan" spiral capability development is critical to the baseline of the EA-18G next generation mission system capability and maintaining tactical relevance in support of Navy Aviation Plan 2030. Development continues for design and integration of avionics systems, integration of Jamming Techniques Optimization improvements, evolutionary software upgrades via the System Configuration Set block builds and related testing. Continued advanced development engineering for improvements in reliability and maintainability are required to ensure maximum benefit is achieved through reduced cost of ownership and to provide enhanced availability.

The FY 2019 funding request continues improvements to the ALQ-218 Airborne Electronic Attack Systems Enhancements (ASE) and Integrated Capability Package (ICP)-3. This funds a combination hardware/software solution to the ALQ-218 receiver to enable low band geo-location, faster geo-location response times, improved location, identification, and probability of intercept by enabling the EA-18G to detect and identify radio frequency emitters with complex waveforms that typically are not able to be detected or identified using traditional methods. ASE provides foundational capabilities needed to support the ICP-3 passive kill chain.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	116.761	173.488	152.520	-	152.520
Current President's Budget	100.825	173.488	147.419	-	147.419
Total Adjustments	-15.936	0.000	-5.101	-	-5.101
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.616	0.000			
• Program Adjustments	0.000	0.000	-3.294	-	-3.294
• Rate/Misc Adjustments	0.000	0.000	-1.807	-	-1.807

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy				Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604269N *I EA-18 Squadrons*		

• Congressional General Reductions Adjustments	-0.003	-	-	-	-
• Congressional Directed Reductions Adjustments	-12.317	-	-	-	-

Change Summary Explanation

Technical: Not Applicable

Schedule: Not Applicable

The FY 2019 funding request was reduced by $0.794M to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*				Project (Number/Name) 3063 / *EA-18G Development*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3063: *EA-18G Development*	1,879.537	100.825	173.488	147.419	-	147.419	159.472	159.966	129.280	108.238	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 378

A. Mission Description and Budget Item Justification

The EA-18G is the replacement aircraft for the EA-6B. The EA-18G development program upgrades the EA-6B's Airborne Electronic Attack capability to detect, identify, locate and suppress hostile emitters; provides enhanced connectivity to National, Theater and Strike assets; and provides organic precision emitter targeting for employment of onboard suppression weapons (High-speed Anti-Radiation Missile family) to fulfill operational requirements. The performance of the aircraft is compatible with the primary strike/fighter aircraft projected to be in the inventory, allowing it to be fully integrated into specific strike packages.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: EA-18G Design and Avionics Integration	40.123	77.725	66.945	0.000	66.945
Articles:	-	-	-	-	-

Description: The EA-18G has the capability to operate autonomously or as a major node in a network-centric operation and is being designed to perform a range of Electronic Warfare/Electronic Attack functions either simultaneously or independently. Funding will be utilized for design and integration of avionics systems into the EA-18G.

FY 2018 Plans:
Continue integration of improvements developed through the Jamming Techniques Optimization teams. Continue and increase engineering, flight hours and test efforts for ALQ-218 Airborne Electronic Attack Systems Enhancements (ASE) upgrade requirements to improve low band geo-location, signal detection, and identification capabilities necessary for complex emitter geo-location and identification. Funds will support a combined hardware/software solution to provide significant capability enhancements to the ALQ-218 which are required to address evolving threats. To incorporate those ALQ-218 ASE upgrades with the System Configuration Sets (SCS) fleet releases on EA-18G, an increase in engineering, system integration, SCS development, Operational Flight Program re-hosting, test planning, materials, lab equipment, and lab/flight testing are being funded.

Increased funding levels added in FY18 to the EA-18G budget are to increase ALQ-218 signal processing capacity and capability by adding the Low-Band Dedicated Receiver (LBDR). Capability enhancements enable

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
better detection and correct identification of modern radars. Capacity improvements provide increased signal processing in current day dense electromagnetic environments. ***FY 2019 Base Plans:*** Continue integration of improvements developed through the Jamming Techniques Optimization teams. Continue and increase engineering, flight hours and test efforts for ALQ-218 Airborne Electronic Attack Systems Enhancements (ASE) upgrade requirements to improve low band geo-location, signal detection, and identification capabilities necessary for complex emitter geo-location and identification. Funds will support a combined hardware/software solution to provide significant capability enhancements to the ALQ-218 which are required to address evolving threats. To incorporate those ALQ-218 ASE upgrades with the System Configuration Sets (SCS) fleet releases on EA-18G, an increase in engineering, system integration, SCS development, Operational Flight Program re-hosting, test planning, materials, lab equipment, and lab/flight testing are being funded. FY19 continues added funding levels to the EA-18G budget to support increased ALQ-218 signal processing capacity and capability by adding the Low-Band Dedicated Receiver (LBDR). Capability enhancements enable better detection and correct identification of modern radars. Capacity improvements provide increased signal processing in current day dense electromagnetic environments. Additional funds added for Transitioning Reactive Electronic Attack Measures (REAM) technology from a ONR future naval capabilities (FNC) science and technology effort to the platform. This technology and hardware upgrade of the Electronic Attack Unit (EAU) will bring Cognitive Electronic Warfare capability to the platform and is the start to EA-18G BLK II modernization. As well as development and integration of special mission pods in support of BLK II modernization. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was reduced by $10.78 million due to the ramp down of ASE and Low-Band Dedicated Receiver (LBDR)design efforts as they transition to integration and DT ramp up.					
Title: EA-18G Software Development	11.065	15.387	15.695	0.000	15.695
Articles:	-	-	-	-	-
Description: Continued capability enhancements to improve the EA-18G Airborne Electronic Attack capabilities are predominantly realized through evolutionary software upgrades. Funding will be utilized to develop improved software capabilities for the EA-18G through System Configuration Set block software updates.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continue System Configuration Set block software development and integration for the EA-18G, specifically System Configuration Set builds H14, H16 and H18. Additional funds added for continuance of Integrated Capability Package-3 requirements. Increase to engineering efforts for integration of active and passive kill chain capabilities and sensors. Multi System Integration algorithm and sensor developmental efforts also increase at test activities for ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, and Live Virtual Construct interoperability efforts. ***FY 2019 Base Plans:*** Continue System Configuration Set block software development and integration for the EA-18G, specifically System Configuration Set builds H14, H16 and H18. Additional funds added for continuance of Integrated Capability Package-3 requirements. Increase to engineering efforts for integration of active and passive kill chain capabilities and sensors. Funding for Multi System Integration algorithm and sensor developmental efforts also increased at test activities for ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, and Live Virtual Construct interoperability efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was increased by $0.308 million due to increased LBDR SW development.					
Title: EA-18G Developmental & Operational Testing	2.100	5.481	5.591	0.000	5.591
Articles:	-	-	-	-	-
Description: Funding will be utilized to support required test phases of the EA-18G. ***FY 2018 Plans:*** Continue operational and integration test of EA-18G avionics upgrades and System Configuration Set block software updates to include Flight Tests conducted in conjunction with various Fleet Exercises (i.e. FLEX-1X). ***FY 2019 Base Plans:*** Continue operational and integration test of EA-18G avionics upgrades and System Configuration Set block software updates to include Flight Tests conducted in conjunction with various Fleet Exercises (i.e. FLEX-1X). ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was increased by $0.110 million due to increase in H16 DT test increases associated with H16 Time Difference Of Arrival(TDOA).					
Title: EA-18G Flight Plan Engineering / System Configuration Set Development and Integration	47.437	74.795	59.088	0.000	59.088
Articles:	-	-	-	-	-
Description: EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Growler next generation mission system capability. Funding will support the development, test and integration efforts required to maintain tactical relevance in support of Navy Aviation Plan 2030. ***FY 2018 Plans:*** Flight Plan Engineering efforts to include EA-18G improvements necessary for Growler relevance and tactical supremacy; Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance EA-18G Cooperative Engagement Capability. Funding supports development (hardware and software), test and integration efforts for Flight Plan requirements such as Distributed Targeting Processor-Networked (DTP-N) to include Aided Target Recognition, Stationary Target Recognition, Maritime Multiple Target Track and Engagement, Multi-Level Security, Strike Accelerator and Advanced Tactical Data Link; Display Improvements for enhanced sensor integration; Precision Approach and Landing Capability (PALC); Flight Path Control (Magic Carpet); Time Difference Of Arrival (TDOA), Network Centric Collaborative Targeting (NCCT), and continued updates to Wingman Compatibility improvements. FY18 includes an increase in funding to support DTP-N requirements. ***FY 2019 Base Plans:*** Continue Flight Plan Engineering efforts to include EA-18G improvements necessary for Growler relevance and tactical supremacy; Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance EA-18G Cooperative Engagement Capability. Funding supports development (hardware and software), test and integration efforts for Flight Plan requirements such as Distributed Targeting Processor-Networked (DTP-N) to include Aided Target Recognition, Stationary Target Recognition, Maritime Multiple Target Track and Engagement, Multi-Level Security, Strike Accelerator and Advanced Tactical Data Link; Display Improvements for enhanced sensor integration; Precision Approach and Landing Capability (PALC); Flight Path Control (Magic Carpet);					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Time Difference Of Arrival (TDOA), Network Centric Collaborative Targeting (NCCT), and continued updates to Wingman Compatibility improvements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was reduced by $15.507 million due to the Distributed Targeting Processor-Networked (DTP-N) effort winding down per program schedule.					
Title: EA-18G Obsolescence Redesign ***Articles:*** ***Description:*** Develop and test design modifications to address obsolescence issues. ***FY 2018 Plans:*** Develop and test design modifications to hardware components and software systems in response to EA-18G weapon system and ancillary equipment obsolescence issues. ***FY 2019 Base Plans:*** Develop and test design modifications to hardware components and software systems in response to EA-18G weapon system and ancillary equipment obsolescence issues. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A	0.100 -	0.100 -	0.100 -	0.000 -	0.100 -
Accomplishments/Planned Programs Subtotals	100.825	173.488	147.419	0.000	147.419

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/05250: *F-18 Series (OSIP 011-10)*	31.077	34.804	46.905	-	46.905	73.526	94.790	103.558	106.107	185.867	781.215
• RDTEN/1662: *F/A-18 Improvement*	62.601	69.759	102.938	-	102.938	72.980	77.428	75.111	78.695	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The program achieved Full Rate Production in November 2009. Contractual studies are underway for Operational Requirement Document core Block II activities and those efforts will be integrated into the overall EA-18G plan/roadmap as resources permit. EA-18G software upgrades are incrementally developed, integrated and fielded. Software development and integration are coordinated efforts between government activities and industry partners to field capability upgrades to the EA-18G fleet.

E. Performance Metrics

Completion of last Full Rate Production Delivery of EA-18G aircraft scheduled for 2nd Quarter FY2019.

Complete incorporation of EA-18G specific upgrades into the System Configuration Set block software builds to meet planned Fleet Release dates.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 3063 / *EA-18G Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering (SCS/Flight Plan)	WR	NAWCAD : Pax River, MD	34.705	1.489	Dec 2016	6.250	Dec 2017	19.260	Dec 2018	-		19.260	Continuing	Continuing	Continuing
Systems Engineering (SCS/Flight Plan)	WR	NAWCWD : China Lake, CA	102.617	5.493	Dec 2016	20.692	Dec 2017	30.373	Dec 2018	-		30.373	Continuing	Continuing	Continuing
Systems Engineering (SCS/Flight Plan)	WR	NAWCWD : Pt. Mugu, CA	82.116	4.039	Dec 2016	24.607	Dec 2017	25.476	Dec 2018	-		25.476	Continuing	Continuing	Continuing
Systems Engineering (SCS/Flight Plan)	WR	FRCSW : North Island, CA	0.000	0.050	Dec 2016	0.000		0.000		-		0.000	0.000	0.050	-
Systems Engineering (SCS/Flight Plan)	WR	NSMA : Various	0.000	0.250	Apr 2017	4.113	Apr 2018	4.755	Apr 2019	-		4.755	Continuing	Continuing	Continuing
Systems Engineering (Flight Plan DTP-N)	C/CPFF	Boeing : St. Louis, MO	0.000	38.049	Mar 2017	24.955	Mar 2018	10.368	Mar 2019	-		10.368	Continuing	Continuing	Continuing
System Engineering (Flight Plan TDOA)	C/IDIQ	Boeing : St. Louis, MO	1.366	0.977	Dec 2016	6.955	Dec 2017	3.833	Dec 2018	-		3.833	Continuing	Continuing	Continuing
System Engineering (Flight Plan TDOA)	C/CPFF	Northrop Grumman : Various	0.000	1.013	Jun 2017	14.966	Dec 2017	7.066	Dec 2018	-		7.066	Continuing	Continuing	Continuing
System Engineering (ALQ-218 ASE)	C/IDIQ	Northrop Grumman : Various	13.274	38.697	Apr 2017	24.066	Apr 2018	7.271	Apr 2019	-		7.271	Continuing	Continuing	Continuing
Systems Engineering (ALQ-218 ASE)	C/CPFF	Boeing : Various	0.000	3.074	Jun 2017	12.647	Apr 2018	4.985	Apr 2019	-		4.985	Continuing	Continuing	Continuing
Systems Engineering (ALQ-218 LBDR)	WR	NAWCWD : Pt. Mugu, CA	0.000	0.000		1.500	Dec 2017	1.300	Dec 2018	-		1.300	Continuing	Continuing	Continuing
Systems Engineering (ALQ-218 LBDR)	WR	NAWCWD : China Lake, CA	0.000	0.000		1.000	Dec 2017	1.020	Dec 2018	-		1.020	Continuing	Continuing	Continuing
Systems Engineering (ALQ-218 LBDR)	C/IDIQ	Northrop Grumman : Various	0.000	0.000		9.825	Dec 2017	6.000	Dec 2018	-		6.000	Continuing	Continuing	Continuing
Systems Engineering (ALQ-218 LBDR)	C/IDIQ	Boeing : Various	0.000	0.000		1.400	Dec 2017	1.400	Dec 2018	-		1.400	Continuing	Continuing	Continuing
Systems Engineering (Joint AoA - AEA NGAD)	WR	NAWCAD : Pax River, MD	0.000	0.915	Mar 2017	0.000		0.000		-		0.000	0.000	0.915	-
Systems Engineering (Joint AoA - AEA NGAD)	WR	NAWCWD : China Lake, CA	0.000	0.085	Mar 2017	0.000		0.000		-		0.000	0.000	0.085	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering (Joint AoA - AEA NGAD)	C/CPIF	NAVSEA : JHU/APL	0.000	0.500	Sep 2017	0.000		0.000		-		0.000	0.000	0.500	0.500
Prior Year Prod Dev no longer funded in FYDP	Various	Various : Various	1,102.553	0.000		0.000		0.000		-		0.000	0.000	1,102.553	-
		Subtotal	1,336.631	94.631		152.976		123.107		-		123.107	Continuing	Continuing	N/A

Remarks

FY18 funding increases are for Integrated Capability Package-3 (ICP-3) Flight Plan/SCS efforts as well as ALQ-218 Airborne Electronic Attack Systems Enhancements (ASE), which includes Low-Band Dedicated Receiver (LBDR). ICP-3 Flight Plan/SCS efforts include systems engineering, improvement, design and integration efforts for Digital Targeting Processor - Networked (DTP-N), Time Difference Of Arrival (TDOA) and Network Centric Collaborative Targeting (NCCT).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Obsolescence Redesign	Various	Various : Various	0.280	0.100	Jun 2017	0.100	Jun 2018	0.100	Jun 2019	-		0.100	Continuing	Continuing	Continuing
Flight Plan Engineering/ SCS Development and Integration	Various	Various : Various	4.239	1.522	Dec 2016	3.637	Dec 2017	4.568	Dec 2018	-		4.568	Continuing	Continuing	Continuing
Flight Plan: ICP-3	Various	Various : Various	0.000	0.000		4.000	Dec 2017	4.320	Dec 2018	-		4.320	0.000	8.320	-
Prior Year Support no longer funded in FYDP	Various	Various : Various	235.789	0.000		0.000		0.000		-		0.000	0.000	235.789	-
		Subtotal	240.308	1.622		7.737		8.988		-		8.988	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration & Operational Testing	WR	Various : Various	116.225	1.500	Jun 2017	3.731	Jun 2018	6.102	Jun 2019	-		6.102	Continuing	Continuing	Continuing
Integration & Operational Testing	WR	COTF : China Lake, CA	0.000	0.600	Dec 2016	6.819	Dec 2017	6.955	Dec 2018	-		6.955	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 3063 / *EA-18G Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year T&E no longer funded in FYDP	Various	Various : Various	108.533	0.000		0.000		0.000		-		0.000	0.000	108.533	-
		Subtotal	224.758	2.100		10.550		13.057		-		13.057	Continuing	Continuing	N/A

Remarks

Increase from FY18 to FY19 due to T&E efforts for future SCS builds which include ICP-3 capabilities.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support (Seaport-CSS)	C/CPFF	Wyle Lab : Pax River, MD	14.571	0.584	Apr 2017	0.185	Apr 2018	0.188	Apr 2019	-		0.188	Continuing	Continuing	Continuing
Government Engineering Support	WR	NAWCAD : Pax River, MD	33.595	0.432	Dec 2016	0.435	Dec 2017	0.443	Dec 2018	-		0.443	Continuing	Continuing	Continuing
Program Management Support	WR	NAWCAD : Pax River, MD	23.508	0.300	Dec 2016	0.337	Dec 2017	0.343	Dec 2018	-		0.343	Continuing	Continuing	Continuing
Flight Plan Engineering / System Configuration Set Development & Integration	WR	NAWCAD : Pax River, MD	1.450	0.750	Dec 2016	0.750	Dec 2017	0.765	Dec 2018	-		0.765	Continuing	Continuing	Continuing
Flight Plan Engineering / System Configuration Set Development & Integration	WR	NAWCWD : China Lake, CA	0.620	0.320	Dec 2016	0.424	Dec 2017	0.433	Dec 2018	-		0.433	Continuing	Continuing	Continuing
Travel	WR	Various : Various	2.755	0.086	Dec 2016	0.094	Dec 2017	0.095	Dec 2018	-		0.095	Continuing	Continuing	Continuing
Prior Year Mgmt Svcs no longer funded in FYDP	Various	Various : Various	1.341	0.000		0.000		0.000		-		0.000	0.000	1.341	-
		Subtotal	77.840	2.472		2.225		2.267		-		2.267	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,879.537	100.825		173.488		147.419		-		147.419	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

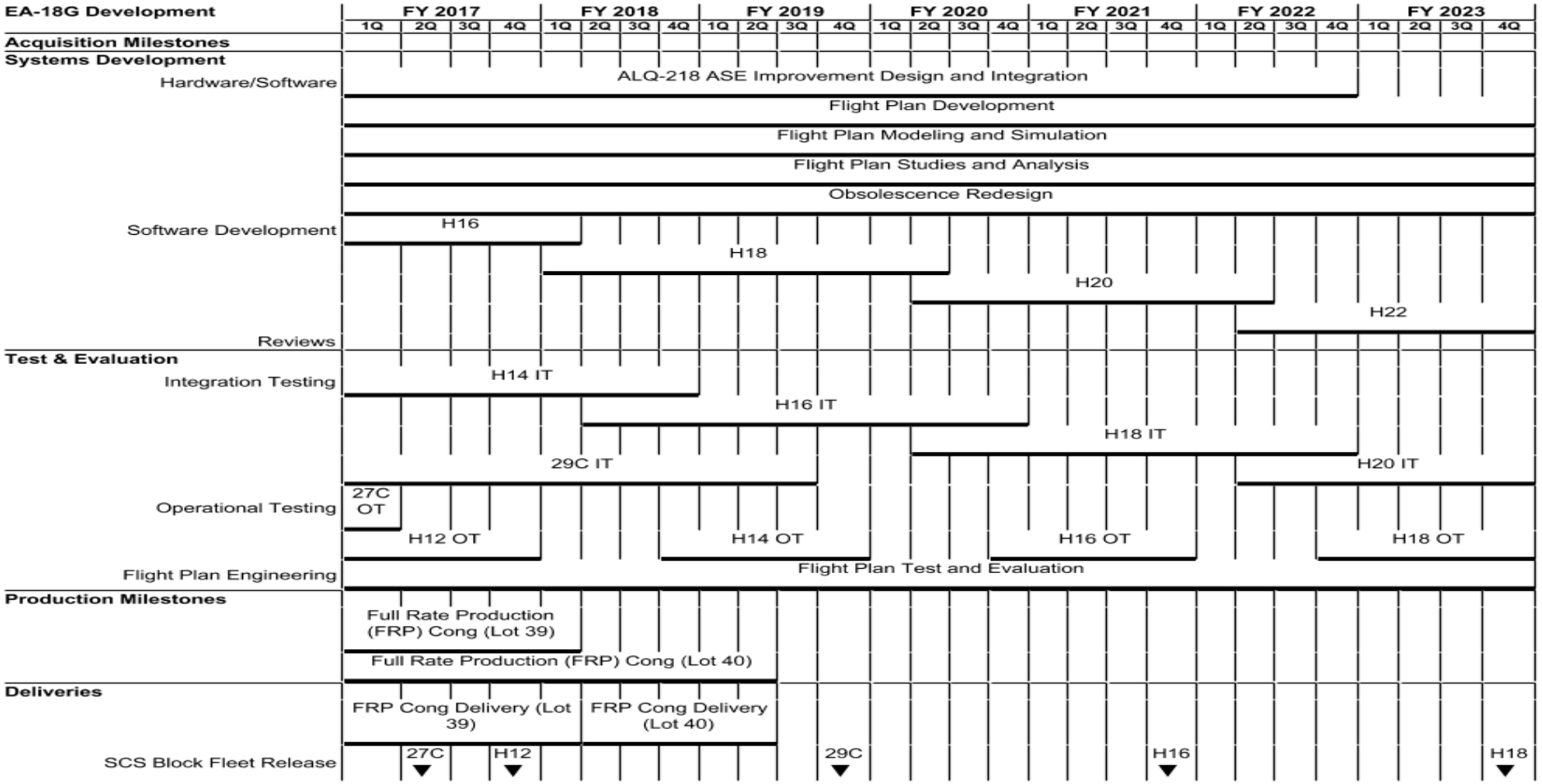
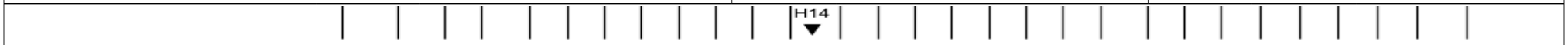


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*



2019PB - 0604269N - 3063

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EA-18G Development				
Systems Development: Hardware/Software: ALQ-218 ASE Improvement Design and Integration	1	2017	4	2022
Systems Development: Hardware/Software: Flight Plan Development	1	2017	4	2023
Systems Development: Hardware/Software: Flight Plan Modeling and Simulation	1	2017	4	2023
Systems Development: Hardware/Software: Flight Plan Studies and Analysis	1	2017	4	2023
Systems Development: Hardware/Software: Obsolescence Redesign Development and Testing	1	2017	4	2023
Systems Development: Software Development: H16 Software Development	1	2017	1	2018
Systems Development: Software Development: H18 Software Development	1	2018	2	2020
Systems Development: Software Development: H20 Software Development	2	2020	2	2022
Systems Development: Software Development: H22 Software Development	2	2022	4	2023
Test & Evaluation: Integration Testing: H14 Integration Testing	1	2017	4	2018
Test & Evaluation: Integration Testing: H16 Integration Testing	2	2018	4	2020
Test & Evaluation: Integration Testing: H18 Integration Testing	2	2020	4	2022
Test & Evaluation: Integration Testing: H20 Integration Testing	2	2022	4	2023
Test & Evaluation: Integration Testing: 29C Integration Testing	1	2017	3	2019
Test & Evaluation: Operational Testing: 27C Operational Testing	1	2017	1	2017
Test & Evaluation: Operational Testing: H12 Operational Testing	1	2017	4	2017
Test & Evaluation: Operational Testing: H16 Operational Testing	4	2020	4	2021
Test & Evaluation: Operational Testing: H14 Operational Testing	4	2018	4	2019
Test & Evaluation: Operational Testing: H18 Operational Testing	4	2022	4	2023
Test & Evaluation: Flight Plan Engineering: Developmental, Integration and Operational Testing	1	2017	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Full Rate Production - Congressional add Lot 39	1	2017	1	2018
Production Milestones: Full Rate Production - Congressional add Lot 40	1	2017	2	2019
Deliveries: FRP Cong Delivery (Lot 39)	1	2017	1	2018
Deliveries: FRP Cong Delivery (Lot 40)	2	2018	2	2019
Deliveries: SCS Block Fleet Release: H12 Fleet Release	4	2017	4	2017
Deliveries: SCS Block Fleet Release: H16 Fleet Release	4	2021	4	2021
Deliveries: SCS Block Fleet Release: H18 Fleet Release	4	2023	4	2023
Deliveries: SCS Block Fleet Release: 27C Fleet Release	2	2017	2	2017
Deliveries: SCS Block Fleet Release: 29C Fleet Release	4	2019	4	2019
Deliveries: SCS Block Fleet Release: H14 Fleet Release	4	2019	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604270N *I Electronic Warfare (EW) Dev*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	965.244	44.894	54.055	89.824	-	89.824	127.108	173.933	127.077	137.294	Continuing	Continuing
0556: *EW Counter Response*	473.791	15.138	16.433	17.040	-	17.040	59.163	99.693	39.703	32.841	Continuing	Continuing
1742: *EW Technical Development and T&E*	2.682	1.525	1.106	1.833	-	1.833	1.764	1.614	1.650	1.684	Continuing	Continuing
2175: *Tactical Air Electronic Warfare*	488.771	7.015	2.097	45.074	-	45.074	44.582	57.252	70.615	77.543	0.000	792.949
3308: *Technology Development*	0.000	0.000	2.286	6.108	-	6.108	6.219	8.476	8.634	8.817	Continuing	Continuing
3309: *Assault Survivability Optimization*	0.000	3.484	0.851	0.836	-	0.836	0.827	0.850	0.867	0.886	Continuing	Continuing
3327: *MAGTF EW Aviation Development*	0.000	16.115	29.643	18.562	-	18.562	13.272	4.849	4.606	14.494	Continuing	Continuing
3371: *MAGTF EW Interoperability Development*	0.000	1.617	1.639	0.371	-	0.371	1.281	1.199	1.002	1.029	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 418

A. Mission Description and Budget Item Justification

This program element includes development of Electronic Warfare (EW) systems for the United States Navy (USN), United States Marine Corps (USMC), and United States Army tactical aircraft, USMC helicopters, surface combatants, data link vulnerability assessments, precision targeting, USN and USMC radio frequency jammers, and development and testing of electronic warfare devices for emerging threats and emergency contingencies. This element also includes development of Aircraft Survivability Equipment (ASE) and Electronic Warfare (EW)/countermeasures solutions for the USN, USMC and Coalition Aircraft to include studies and evaluations of current and future aircraft threats, modeling and simulation for improved countermeasure capabilities, and development and testing to address new and emerging threats.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

PE 0604279N and PE 0604376M consolidated to PE 0604270N beginning in FY 2017.

Project Unit 2175 Tactical Air Electronic Warfare Cost to Complete should read $82.128 Million. Total Cost should read $875.077 Million.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604270N *I Electronic Warfare (EW) Dev*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	92.766	54.055	51.563	-	51.563
Current President's Budget	44.894	54.055	89.824	-	89.824
Total Adjustments	-47.872	0.000	38.261	-	38.261
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.240	0.000			
• SBIR/STTR Transfer	-0.724	0.000			
• Program Adjustments	-44.000	0.000	13.510	-	13.510
• Rate/Misc Adjustments	0.000	0.000	24.751	-	24.751
• Congressional Directed Reductions Adjustments	-6.388	-	-	-	-

Change Summary Explanation

Cost: Not Applicable.
Project Unit 3309 / Assault Survivability Optimization: 0.140M reprogrammed from PE 0604272N PU 3304 to determine applicability of 1x1x8 countermeasures flares on Navy aircraft.

Technical: Not Applicable.

Schedule:
Project Unit 0556 / EW COUNTER RESPONSE: N/A

Project Unit 1742 / EW Technical Development and T&E: N/A

Project Unit 2175 / Tactical Air Electronic Warfare: Acquisition Milestones: ALQ-214 SW Improvement Initial Operational Capability (IOC) was changed to a Fleet Release. ALQ-214 Adaptive Radar Countermeasures (ARC) Contract Award was added in the 2nd Qtr. FY 2019. Dual Band Decoy (DBD) Contract Award was added in the 3rd Qtr. FY 2019. Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Systems Requirements Review was added in 3rd Qtr. FY 2019. ALQ-214 ARC Preliminary Design Review was added in 1st Qtr. FY 2020. ALQ-214 ARC Critical Design Review was added in 2nd Qtr. FY 2020. ALQ-214 ARC Build 1 was added in 3rd Qtr. FY 2020. AlQ-214 ARC Build 2 was added in 1st Qtr. FY 2021. ALQ-214 ARC Build 3 was added in 3rd Qtr. FY 2021. ALQ-214 ARC Build 3.1 was added in 1st Qtr. 2022. ALQ-214 ARC Build 4 was added in 2nd Qtr. FY 2022. DBD Development: DBD Development from 3rd Qtr. FY 2019 through 4th Qtr. FY 2024 was added. DBD Systems Requirements Review was added in 4th Qtr. FY 2019. DBD Preliminary Design Review

was added in 2nd Qtr. FY 2020. DBD Critical Design Review was added in 4th Qtr. FY 2020. Test and Evaluation: ALQ-214 SW Improvement Testing: SWIP Developmental Testing/Integrated Testing DT/IT completion changed from 2nd Qtr. FY 2017 to 3rd Qtr. FY 2018 due to delays in software maturation and progression. ALQ-214 SW Improvement Integrated Test(IT)/Follow-on Test & Evaluation (FOT&E) was removed due to lack of closed-loop threat resources for test. ALQ-214 ARC Testing: ARC Developmental Testing from 4th Qtr. 2020 through 4th Qtr. 2021 was added. ARC Integrated Testing from 1st Qtr. 2022 through 3rd Qtr. 2022 was added. ARC Operational Testing from 1st Qtr. 2023 through 2nd Qtr. 2023 was added. DBD Developmental Testing from 4th Qtr. FY 2021 through 2nd Qtr. FY 2022 was added. DBD Integrated Testing from 3rd Qtr. FY 2022 through 2nd Qtr. FY 2023 was added. DBD Operational Testing from 3rd Qtr. FY 2023 through 4th Qtr. FY 2024 was added. Production Milestones: DBD Low Rate Initial Production was added in 2nd Qtr. FY 2022.

Project Unit 3308 / Technology Development: Milestones: Software Release 17 removed due to zero funding received in FY 2017. Contract Awards: Operational Flight Program (OFP) added in 2nd Qtr. FY 2018 with additional awards in the 2nd Qtr. of each year continuing through 2nd Qtr. 2023. Target Generator added in 2nd Qtr. FY 2018 and 2nd Qtr. FY 2019. Systems Development: Systems Development Reviews: FY 2017 Review removed due to zero funding received in FY 2017. System Development Analysis: FY-17 Analysis removed due to zero funding received in FY 2017. Threat Analysis/Technique Optimization added beginning in the 2nd Qtr. FY 2019 through 4th Qtr. FY 2019 and continuing from 2nd Qtr. through 4th Qtr. of each year through FY 2023. Software Development FY-17 SW/Technique Development removed due to zero funding received in FY 2017. Test and Evaluation: Integrated Evaluation: FY-17 Integrated Evaluation removed due to zero funding received in FY 2017. Threat Simulation and Test Assets: Digital Radio Frequency Memory (DFRM) Target Generator Development added in 2nd Qtr. FY 2018 through 3rd Qtr. FY 2019. DFRM Target Generator Integration and Testing added in 4th Qtr. FY 2019 through 4th Qtr. FY 2020. IDECM Model Development added in 1st Qtr. FY 2021 through 3rd Qtr. FY 2021. FY-22 IDECM Model Lab Integration added in 1st Qtr. FY 2022 through 3rd Qtr. FY 2022 and 1st Qtr. FY 2023 through 3rd Qtr. FY 2023.

Project Unit 3309 / Assault Survivability Optimization: FY 2017 flight test changed from 2nd/3rd Qtr to 3rd/4th Qtr due to aircraft and test range availability. FY17 Test MDF changed from 2nd Qtr to 3rd Qtr to align with flight test. FY 2018 flight test changed from 2nd/3rd Qtr to 4th Qtr due to test range availability. FY18 Test MDF changed from 2nd Qtr to 3rd Qtr to align with flight test. Added Radio Frequency Countermeasure (Chaff) fight test for MH-60 2nd Qtr 2018. Initiated modeling and simulation and engineering and evaluation to determine applicability of 1x1x8 countermeasures on Navy aircraft platforms.

Project Unit 3327 / MAGTF EW Aviation Development: AN/ALQ-231(V)3 UH-1 Jettison Capability, Electronic Warfare Services Architecture, Marine Air Ground Tablet Integration with AN/ALQ-231(V), MAGTF EW Jammer Techniques Development, KC-130 Integration for AN/ALQ-231(V)1 Block 1 Communication Jammer, Electronic Warfare Range Improvements and Upgrades funding and schedules were removed in FY 2017 due to funding realignments. Unmanned Aircraft System Electronic Warfare Payload MS B moved from 1st Qtr. FY 2018 to 4th Qtr. FY 2018 and UAS EW Lot 1 award moved from 3rd Qtr. FY 2020 to 2nd Qtr. FY 2021 to align with updated schedule. UAS EW Lot 1 deliveries moved from beginning in 3rd Qtr. FY 2021 to 2nd Qtr. FY 2022. IOC moved from 3rd Qtr. FY 2021 to 2nd Qtr. FY 2022 to align with the updated delivery schedule. AN/ALQ-231(V)3 production and delivery lots updated to align with current production and delivery schedule, but total quantity remains the same. AN/ALQ-231(V)3 Production-Delivery Lot 9 updated from Qty 10 to Qty 9, Production-Delivery Lot 10 updated from Qty 10 to Qty 22, and Production-Delivery Lots 11 and 12 no longer required. AN/ALQ-231(V)1 BLK X production and delivery lots updated to align with current production and delivery schedule, but total quantity remains the same. AN/ALQ-231(V)1 BLK X Production-Delivery Lot 1 updated from Qty 1 to Qty 2, and Production-Delivery Lot 2 updated from Qty 4 to Qty 3.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604270N *I Electronic Warfare (EW) Dev*

Project Unit 3371 / MAGTF EW Interoperability Development: SPIRAL 2 FIELD EVALUATION MV-22 extended from 4th Qtr 2017 to 4th Qtr 2019 due to delayed testing and updated schedule

Project Units 3308, 3309, 3327, and 3371 were incorporated into PE 0604270N in PB17. PE 0604279N PU 3309 Prior Year amount is $21.566M.

Project Unit 3327 / MAGTF EW Aviation Development: The FY 2019 funding request was reduced by $2.668 million to account for the availability of prior year execution balances.

Project Unit 2175 Tactical Air Electronic Warfare: The FY 2019 funding request was reduced by $1.974 million to account for the availability of prior year execution balances.

The FY 2019 funding request was reduced by $0.684 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 0556 / *EW Counter Response*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0556: *EW Counter Response*	473.791	15.138	16.433	17.040	-	17.040	59.163	99.693	39.703	32.841	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Jammer Techniques Optimization (JATO) organization produces the jamming techniques and Electronic Attack (EA) optimization algorithms that are critical for current and future Airborne Electronic Attack (AEA) systems of the United States Navy (USN) and United States Marine Corps (USMC) to execute the evolving AEA mission. Through Modeling & Simulation (M&S), laboratory testing, and field testing, JATO optimizes parameters for existing EA systems (such as AN/ALQ-99 Tactical Jamming System (TJS) and the AN/ALQ-231(V) Intrepid Tiger II Family of Systems) to best counter existing threats, and applies that knowledge to define the requirements for follow-on AEA systems such as the Next Generation Jammer Mid-Band (NGJ-MB) and Next Generation Jammer Low-Band (NGJ-LB) programs. As commercial and military Radio Frequency (RF) threats evolve and proliferate, the JATO organization provides updated tactics, techniques, and procedures to maximize the potency of USN and USMC AEA in meeting the Combatant Command (COCOM) Commanders' EW priorities, to include Anti-Access/Area Denial (A2AD), Force Protection, Information Operations, and enhanced communications jamming. (Classified discussion available upon request).

JATO's Advanced Techniques Group (ATG) focuses specifically on electronic countermeasures to advanced threat weapon systems and Command, Control, and Communications (C3) networks that are challenging existing EA approaches, and how to best apply advances in geolocation and unknown threat characterization to EA responses. Additional efforts include risk reduction activities to evaluate and minimize EA interference with US weapons systems, and research/technology studies in support of upgrades to existing AEA systems such as the AN/ALQ-99 TJS.

The Electronic Warfare (EW) Advanced Capability Development project focuses on increasing the Department of the Navy's understanding and utilization of rapidly-evolving technologies that operate in the Electromagnetic spectrum. As commercial and military Radio Frequency (RF) threats evolve and proliferate, this project tracks the relevant technology, intelligence, and tactics to maximize the potency of USN and USMC AEA through the rapid insertion of emergent technologies into existing AEA systems.

The Special Mission Pods (SMPs) project will investigate developmental and existing technologies to determine the feasibility of rapidly integrating unique EA and electromagnetic surveillance (ES) capabilities into a platform agnostic capability for the USN. The resultant system(s) will be capable of rapidly adapting, detecting, and engaging evolving electronic warfare targets in cooperation with shared organic, theater, and national EA and ES assets.

AN/ALQ-99 TJS Band 9/10 pods will remain in service after the fielding of NGJ-MB and NGJ-LB. The Batwing Reflector Air to Ground variant for the AN/ALQ-99 Band 9/10 Transmitter will deliver improved EA capability as compared to the baseline AN/ALQ-99 Band 9/10 Transmitter. (Classified discussion available upon request).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JAMMER TECHNIQUES OPTIMIZATION (JATO)	15.138	16.433	16.505	0.000	16.505

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
FY 2018 Plans: The JATO organization will continue engineering development and test support of existing and emerging systems such as the EA-6B, EA-18G, and NGJ to address potential RF and Cyber/EW effects on current and evolving radar/communications threats. JATO will continue to generate techniques, tactics, and procedures to optimize the capabilities of systems such as, but not limited to, the AN/ALQ-99, USQ-113, ALQ-218, ALQ-227, AN/ALQ-231(V), ALE-43; and assist in requirements definitions of emerging AEA systems. JATO continues to lead efforts in support of Overseas Operations and Force Protection issues. (Classified discussion available upon request). Increase in funding from FY 2017 to FY 2018 is required to support additional testing requirements for developmental EW systems, and to provide increased flight and ground testing against adversary systems. Additionally, funds will provide for increased efforts of the Advanced Techniques Group (ATG) to address Cyber/ EW threats.					
FY 2019 Base Plans: The JATO organization will continue engineering development and test support of existing and emerging systems such as the EA-6B, EA-18G, and NGJ to address potential RF and Cyber/EW effects on current and evolving radar/communications threats. JATO will continue to generate tactics, techniques, and procedures to optimize the capabilities of systems such as, but not limited to, the AN/ALQ-99, USQ-113, ALQ-218, ALQ-227, AN/ALQ-231(V), ALE-43, and Unmanned Aerial Systems (UAS) payloads. JATO continues to meet COCOM Commanders' EW priorities including support for Overseas Contingency Operations and Force Protection. (Classified discussion available upon request).					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase in funding from FY 2018 to FY 2019 is required to support planning for increased flight test and ground/ laboratory test efforts expected to commence in FY 2020. Additionally, the increased funding will allow the JATO program to capitalize on investments in Test & Evaluation (T&E) Ranges made via PE 0604759N: Major T&E Investment.					
Title: ELECTRONIC WARFARE (EW) ADVANCED DEVELOPMENT	0.000	0.000	0.535	0.000	0.535
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** This project focuses on increasing the Department of the Navy's understanding and utilization of rapidly-evolving technologies to control the Electromagnetic spectrum. Efforts in FY 2019 include the investigation of rapid technology insertions into systems including, but not limited to, the AN/ALQ-99, AN/ALQ-231(V), The Next Generation Jammer, and Unmanned Aerial Systems (UAS) payloads to address existing capability gaps on COCOM Commanders' Integrated Priority Lists Technology integration analysis to mitigate interoperability issues and ensure maximum lethality is also addressed. (Classified discussion available upon request). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** This project was previously funded under the JAMMER TECHNIQUES OPTMIZATION (JATO) project and the tasking is now being separated in order to provide increased clarity and transparency.					
Accomplishments/Planned Programs Subtotals	15.138	16.433	17.040	0.000	17.040

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0513: *AEA Systems*	50.451	52.960	25.277	-	25.277	46.105	62.778	56.612	58.069	90.195	722.526

Remarks

D. Acquisition Strategy

The JATO organization, comprised of a partnership between the Government and several University Aligned Research Centers, continues to research EW tactics and techniques. The JATO prime delivery order, a cost plus fixed fee contract that covers the period of FY 2017 through FY 2021, was awarded to Johns Hopkins University in 4th Qtr. FY 2017.

The Electronic Warfare (EW) Advanced Capability Development project will investigate developmental and existing technologies from commercial and governmental sources for incorporation into USN and USMC AEA systems. These technologies, once demonstrated to have sufficient maturity, will transition into the applicable acquisition programs. Additionally, the project will pursue technology development and demonstration through rapid acquisition or Speed to Fleet initiatives to the greatest extent possible.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

The Special Mission Pods project will investigate developmental and existing technologies commencing in 2Qtr. FY 2020 to enable United States Navy (USN) electronic warfare technology to maintain relevancy and superiority against rapidly evolving electronic threats. These efforts will result in the integration of new, modified, or upgraded electronic warfare pods for USN aircraft platforms.

The Batwing Reflector Air to Air variant for the AN/ALQ-99 Band 9/10 Transmitter began procurement in FY 2017 as part of a Speed to Fleet initiative. Development of the Batwing Reflector Air to Ground variant for the AN/ALQ-99 Band 9/10 Transmitter flown on the EA-18G platform will commence in 2Qtr. FY 2020 and will capitalize on investments already made on the Batwing Air to Air variant.

E. Performance Metrics

JATO development counters enemy radar systems and communication systems to provide techniques to protect allied forces.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HDW Develop - ICAP III	C/FFP	Various : Various	262.104	0.000		0.000		0.000		-		0.000	0.000	262.104	262.104
Primary HDW Develop - Batwing Reflector Air to Ground Variant	C/CPIF	Various : Various	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering NRL	WR	Naval Research Lab : Maryland	12.047	1.800	Nov 2016	1.635	Nov 2017	1.657	Nov 2018	-		1.657	Continuing	Continuing	Continuing
Systems Engineering NAWCAD	WR	NAWCAD : Patuxent River, MD	24.741	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering NAWCWD	WR	NAWCWD : Point Mugu, CA	86.815	4.376	Nov 2016	4.642	Nov 2017	4.758	Nov 2018	-		4.758	Continuing	Continuing	Continuing
Systems Engineering NAWCWD	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering NSWC	WR	NSWC Det : Crane, IN	10.921	0.625	Nov 2016	0.675	Nov 2017	0.803	Nov 2018	-		0.803	Continuing	Continuing	Continuing
Systems Engineering VAR	WR	Various : Various	14.893	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Development cost no longer Funded in the FYDP	Various	Various : Various	1.043	0.000		0.000		0.000		-		0.000	0.000	1.043	1.043
		Subtotal	412.564	6.801		6.952		7.218		-		7.218	Continuing	Continuing	N/A

Remarks

Growth in excess of inflation indices in FY 2018 is due to increased efforts related to flight testing.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support - Jammer Techniques Optimization (JATO)	SS/CPFF	Johns Hopkins Unv : Maryland	39.529	4.878	Nov 2016	4.838	Nov 2017	5.110	Nov 2018	-		5.110	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Eng & Tech Srvc (Non FFRDC)	Various	Various : Various	18.002	1.029	Nov 2016	1.869	Nov 2017	1.896	Nov 2018	-		1.896	Continuing	Continuing	Continuing
Prior year Support costs no longer funded in the FYDP	Various	Various : Various	2.256	0.000		0.000		0.000		-		0.000	0.000	2.256	-
		Subtotal	59.787	5.907		6.707		7.006		-		7.006	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Jammer Techniques Optimization (JATO) Flight Test	WR	NAWCWD : Point Mugu, CA	0.000	0.600	Nov 2016	2.091	Nov 2017	2.122	Nov 2018	-		2.122	Continuing	Continuing	Continuing
JATO Ground/Lab Test	WR	NAWCWD : Point Mugu, CA	0.000	1.700	Nov 2016	0.553	Nov 2017	0.564	Nov 2018	-		0.564	Continuing	Continuing	Continuing
		Subtotal	0.000	2.300		2.644		2.686		-		2.686	Continuing	Continuing	N/A

Remarks

Jammer Techniques Optimization (JATO) Flight and Ground/Lab Tests broken out separately from Systems Engineering efforts for budget clarity in FY 2017. These items fund tests of JATO techniques, tactics, and procedures (TTPs) against real and simulated adversary systems. Late receipt of FY 2017 funding hindered ability to secure Flight Test ranges; Flight Test funds were used to support Ground/Lab test requirements. FY 2018 includes an additional four JATO Flight Tests over budgeted efforts in FY 2017.

Management Services ($ in Millions)

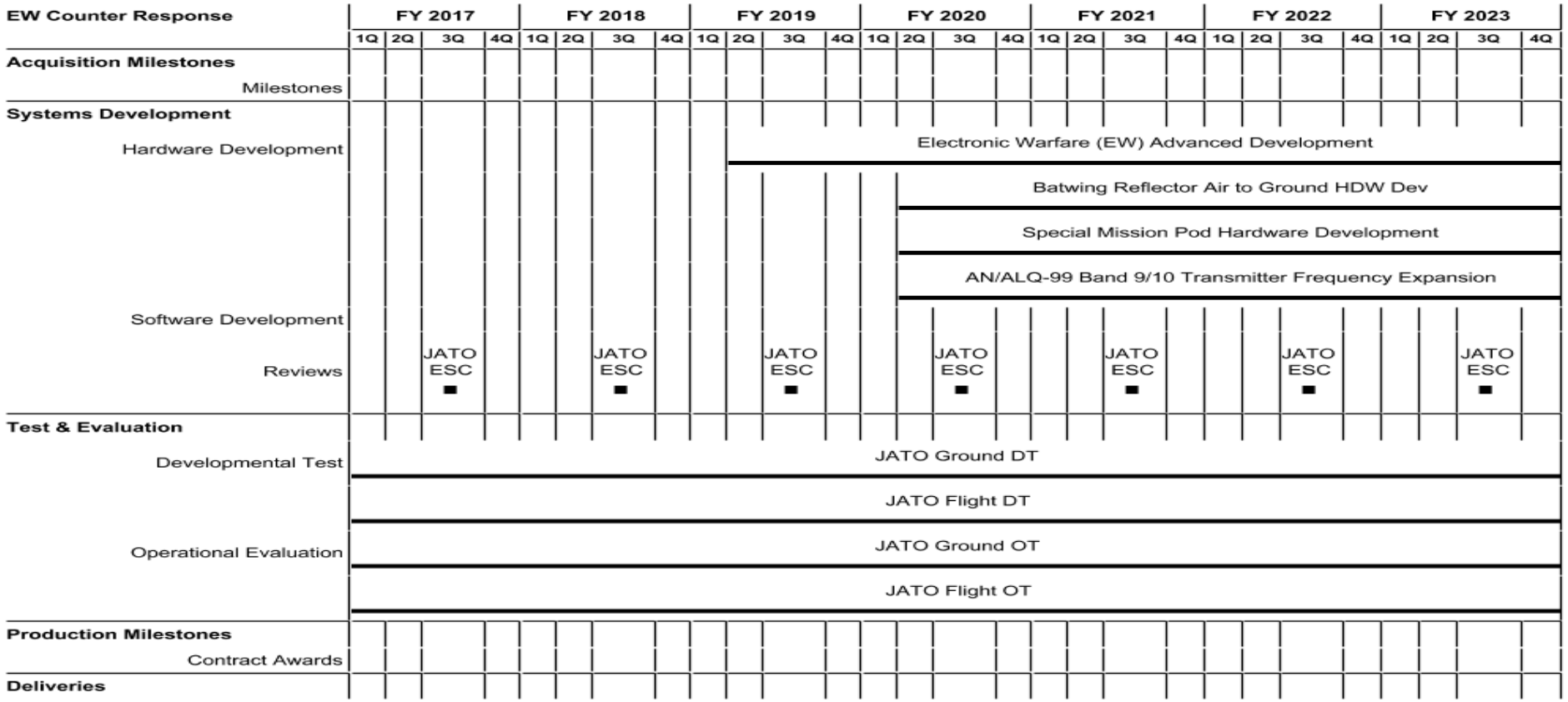
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	Various : Various	1.235	0.030	Oct 2016	0.030	Oct 2017	0.030	Oct 2018	-		0.030	Continuing	Continuing	Continuing
Travel	WR	Various : Various	0.205	0.100	Oct 2016	0.100	Oct 2017	0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
		Subtotal	1.440	0.130		0.130		0.130		-		0.130	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 0556 / *EW Counter Response*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	473.791	15.138		16.433		17.040		-		17.040	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*



2019PB - 0604270N - 0556

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 0556 / *EW Counter Response*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EW Counter Response				
Systems Development: Hardware Development: Electronic Warfare (EW) Advanced Development	2	2019	4	2023
Systems Development: Hardware Development: Batwing Reflector Air to Ground Hardware Development	2	2020	4	2023
Systems Development: Hardware Development: Special Mission Pod Hardware Development	2	2020	4	2023
Systems Development: Hardware Development: AN/ALQ-99 Band 9/10 Transmitter Frequency Expansion	2	2020	4	2023
Systems Development: Reviews: JATO Executive Steering Committee 2017	3	2017	3	2017
Systems Development: Reviews: JATO Executive Steering Committee 2018	3	2018	3	2018
Systems Development: Reviews: JATO Executive Steering Committee 2019	3	2019	3	2019
Systems Development: Reviews: JATO Executive Steering Committee 2020	3	2020	3	2020
Systems Development: Reviews: JATO Executive Steering Committee 2021	3	2021	3	2021
Systems Development: Reviews: JATO Executive Steering Committee 2022	3	2022	3	2022
Systems Development: Reviews: JATO Executive Steering Committee 2023	3	2023	3	2023
Test & Evaluation: Developmental Test: JATO Ground Developmental Test	1	2017	4	2023
Test & Evaluation: Developmental Test: JATO Flight Developmental Test	1	2017	4	2023
Test & Evaluation: Operational Evaluation: JATO Ground Operational Test	1	2017	4	2023
Test & Evaluation: Operational Evaluation: JATO Flight Operational Test	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 1742 / *EW Technical Development and T&E*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1742: *EW Technical Development and T&E*	2.682	1.525	1.106	1.833	-	1.833	1.764	1.614	1.650	1.684	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds efforts that focus on the quick reaction prototyping of tactical information and electronic warfare systems. This program directly addresses various Fleet requirements across multiple platforms (airborne, surface and subsurface), airborne and surface cryptologic operational requirements documents and the joint oversight council missions needs statement to research, assess, and develop information warfare and electronic warfare systems and capabilities. These systems/ capabilities provide information dominance to friendly forces during conflict, which is necessary for successful mission accomplishment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Electronic Warfare Technical Development Studies and Test & Evaluation	1.525	1.106	1.833	0.000	1.833
Articles:	-	-	-	-	-
Description: This program element includes development of Electronic Warfare (EW) systems for the United States Navy (USN), United States Marine Corps (USMC), and United States Army tactical aircraft, USMC helicopters, surface combatants, data link vulnerability assessments, precision targeting, USN and USMC radio frequency jammers, and development and testing of electronic warfare devices for emerging threats and emergency contingencies. This program directly addresses various Navy requirements across multiple platforms (airborne, surface and subsurface), airborne and surface cryptologic operational requirements documents and the joint oversight council missions needs statement to research, assess, and develop information warfare and electronic warfare systems and capabilities. These systems/capabilities provide information dominance to friendly forces during conflict, which is necessary for successful mission accomplishment. ***FY 2018 Plans:*** Complete the study of the vulnerability analysis on emerging/changing threats/targets for EW programs. Assess vulnerabilities in adversary systems and signals with the purpose of developing countermeasures to create Commanders desired effects. Realize vulnerability in order to develop and integrate specific wave forms into Maritime Cryptologic Systems (MCS-21).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 1742 / *EW Technical Development and T&E*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Provide hardware prototyping and testing. Provide support for test plan development, antenna/platform integration, testing, and post-test analyses. ***FY 2019 Base Plans:*** Continue to assess vulnerabilities in adversary systems and signals with the purpose of developing countermeasures to create Commanders desired effects. Continue to realize vulnerability in order to develop and integrate specific wave forms into Maritime Cryptologic Systems (MCS-21). Continue to provide hardware prototyping and testing. Continue to provide support for test plan development, antenna/platform integration, testing, and post-test analyses. Provide Subject Matter Expertise (SME) of Foreign Material Exploitation and reverse engineering efforts to develop and deliver a Cyber capability to EUCOM and CENTCOM AORs. SMEs also conduct high-priority, sole source, signal discovery and technical analysis that supports countermeasure development in EUCOM and PACOM AORs. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in between FY18 and FY19 supports the delivery of Cyber and Electronic Warfare capabilities specifically for highly classified projects. Funds provide Subject Matter Expertise (SME) of Foreign Material Exploitation and reverse engineering efforts to develop and deliver a Cyber capability to EUCOM and CENTCOM AORs. SMEs also conduct high-priority, sole source, signal discovery and technical analysis that supports countermeasure development in EUCOM and PACOM AORs.					
Accomplishments/Planned Programs Subtotals	1.525	1.106	1.833	0.000	1.833

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Development of classified prototypes and special capabilities. The Navy is granted streamlined acquisition authority for the development of classified prototypes and special capabilities under the DASN (C4I).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 1742 / *EW Technical Development and T&E*

E. Performance Metrics

Research, assess and develop EW/IW capabilities. The Navy serves as the Program Management Office of the EW Technical Development and Information Warfare (IW) program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 1742 / *EW Technical Development and T&E*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	C/FP	Navy System Management Activity : JBAB, DC	0.000	0.160	Jan 2017	0.160	Oct 2017	0.160	Oct 2018	-		0.160	Continuing	Continuing	Continuing
Studies & Analysis	Various	Clasified : Various	2.682	1.365	Jan 2017	0.946	Oct 2017	1.673	Oct 2018	-		1.673	0.000	6.666	-
		Subtotal	2.682	1.525		1.106		1.833		-		1.833	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.682	1.525		1.106		1.833		-		1.833	Continuing	Continuing	N/A

Remarks

Increase in between FY18 and FY19 supports the delivery of Cyber and Electronic Warfare capabilities specifically for highly classified projects. Funds provide Subject Matter Expertise (SME) of Foreign Material Exploitation and reverse engineering efforts to develop and deliver a Cyber capability to EUCOM and CENTCOM AORs. SMEs also conduct high-priority, sole source, signal discovery and technical analysis that supports countermeasure development in EUCOM and PACOM AORs.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 1742 / *EW Technical Development and T&E*

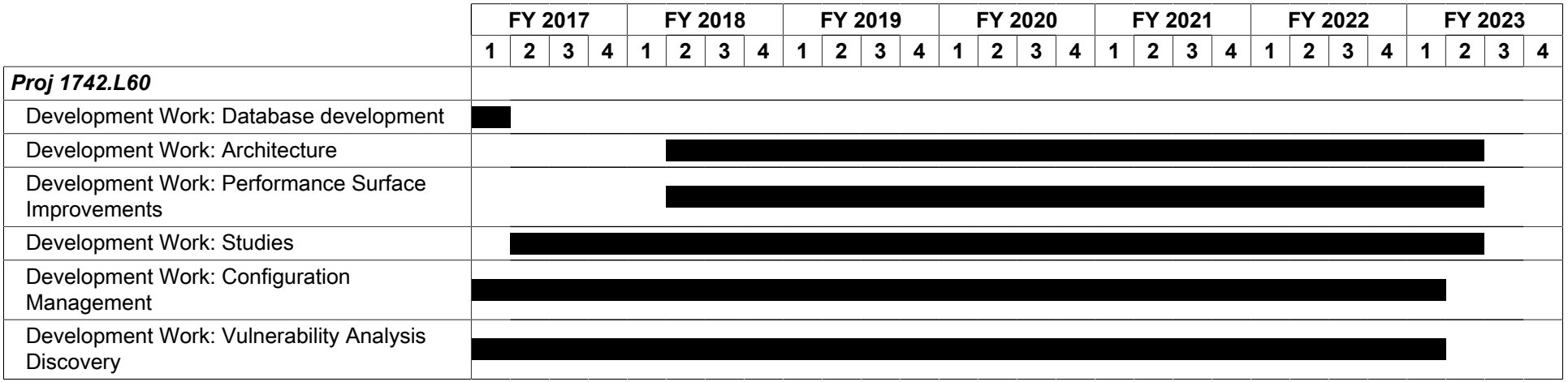


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 1742 / *EW Technical Development and T&E*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1742.L60				
Development Work: Database development	1	2017	1	2017
Development Work: Architecture	2	2018	2	2023
Development Work: Performance Surface Improvements	2	2018	2	2023
Development Work: Studies	2	2017	2	2023
Development Work: Configuration Management	1	2017	1	2023
Development Work: Vulnerability Analysis Discovery	1	2017	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 2175 / *Tactical Air Electronic Warfare*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2175: *Tactical Air Electronic Warfare*	488.771	7.015	2.097	45.074	-	45.074	44.582	57.252	70.615	77.543	0.000	792.949
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 418

A. Mission Description and Budget Item Justification

Integrated Defensive Electronic Countermeasures (IDECM) Block 3 (IB-3/ALE-55) introduced the new Fiber Optic Towed Decoy (FOTD), ALE-55, capability to the IDECM Block 2 Electronic Warfare (EW) suite as a replacement for the ALE-50 decoy. The FOTD, when integrated with the rest of the F/A-18E/F EW suite (i.e., ALQ-214, ALR-67(V)3, ALE-47 and ALE-50), the associated cockpit controls, displays and other avionics significantly improves the survivability of the host aircraft in a radio frequency threat environment. IB-3 MS III (Full-Rate Production Decision) was approved in the 4th Qtr. FY 2011. IB-3 Initial Operational Capability (IOC) was achieved 4th Qtr. FY 2011.

IDECM Block 4 (IB-4) is an Engineering Change Proposal (ECP) to the ALQ-214 to render it suitable for operation on F/A-18C/D aircraft (replacing the ALQ-126B and significantly improving F/A-18C/D survivability) while retaining all IDECM suite functionality when installed on F/A-18E/F aircraft. The IB-4 acquisition and contract strategy includes development of the Common On-Board Jammer for the F/A-18 C/D/E/F aircraft through sole source contract awards for modifications to the ALQ-214. IB-4, ALQ-214 ECP efforts include hardware and software design, development and test, delivery of 17 engineering development models, integration and testing on the host aircraft. The F/A-18 EW suite includes the ALR-67 Radar Warning Receiver (RWR), the ALE-47 Countermeasures Dispensing Set (CMDS), the mission computer and other avionics. In addition to performing the RWR function, the ALR-67 is the EW bus controller. The EW bus is the primary interface between the EW systems (Jammer, RWR, and CMDS). The mission computer is the avionics bus controller, the interface between the EW suite and other avionics. IB-4 production Cut-In occurred 2nd Qtr FY 2012, Initial Operational Capability (IOC) achieved May 2015.

ALQ-214 software improvement will provide the ALQ-214 with digital radio frequency memory deny-delay, technique capability significantly improving F/A-18C/D/E/F survivability. Acquisition and contract strategy includes development, integration and test of the ALQ-214 software improvements through sole-source contract award. Modifications to other F/A-18E/F Block II and Block III aircraft avionics may be required in order to develop and integrate this capability. These other avionics may include, but are not limited to, the ALR-67(V)2, ALR-67(V)3, ALE-47, ALE-50, ALE-55, mission computer and fire control radar.

F/A-18 E/F ALQ-214 Adaptive Radar Countermeasures (ARC) will provide the ALQ-214 with improved RF threat detection algorithms and jamming against modern threat radars. Modifications to other F/A-18E/F Block II and Block III aircraft avionics may be required in order to develop and integrate this capability. These other avionics may include, but are not limited to, the ALR-67(V)2, ALR-67(V)3, ALE-47, ALE-50, ALE-55, mission computer and fire control radar.

The Dual Band Decoy (DBD) will provide expanded Radio Frequency (RF) capability against current and emerging modern RF threat radars, significantly improving the survivability of the F/A-18 E/F. DBD will replace the current ALE-55 FOTD when Initial Operational Capability is achieved in FY 2025. Modifications to other F/A-18E/

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

F Block II and Block III aircraft avionics may be required in order to develop and integrate this capability. These other avionics may include, but are not limited to, the ALR-67(V)2, ALR-67(V)3, ALE-47, ALE-50, ALE-55, mission computer and fire control radar.

Project Unit 2175 Tactical Air Electronic Warfare Cost to Complete should read $82.128 Million. Total Cost should read $875.077 Million.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Tactical Air EW	7.015	2.097	45.074	0.000	45.074
Articles:	-	-	-	-	-
FY 2018 Plans: ALQ-214 Software Improvement will complete and field in FY 2018					
FY 2019 Base Plans: IDECM ARC Development, Integration and Test will begin in FY 2019 and continue into FY 2023. Dual Band Decoy (DBD) Development, Integration and Test will begin in FY 2019 and continue through FY 2023.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase of $42.977M due to the Integration of IDECM ARC Development and Dual Band Decoy (DBD) Development. ARC Integration and Test will begin in FY 2019 and continue through FY 2023. DBD Integration and Test will begin in FY 2019 and continue through FY 2023.					
Accomplishments/Planned Programs Subtotals	7.015	2.097	45.074	0.000	45.074

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0576 004-12: *Common On-Board Jammer*	54.568	49.976	46.854	-	46.854	47.039	48.003	48.952	49.911	90.409	789.230
• PANMC/0182: *Airborne Expendable CM*	20.480	23.534	23.712	-	23.712	24.227	24.632	44.745	46.344	Continuing	Continuing

Remarks

Airborne Expendable Countermeasures funding only includes the Active Jammer ALE-55 Fiber Optic Towed Decoy (FOTD) and associated other support. Per the Acquisition Decision Memorandum dated 18 August 2017, PMA 272 was directed by ASN (RD&A) to remove IDECM Block 2/3 from reporting.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

D. Acquisition Strategy

IB-4 Engineering Change Proposal (ECP) and Software Improvement (SWIP) development contracts were awarded sole-source to Harris in 2009 and 2012 respectively. Harris is the original developer/manufacturer and current sustainer of the ALQ-214. Annual IB-4 production awards are planned through 2025.

ARC development contract is planned as a sole source to Harris beginning in 2019 and continuing into 2023. DBD development contract is planned as a competition, though urgency of need due to emerging threats may necessitate an alternate approach. This development contract is planned for award in 2019 and continuing through 2023.

E. Performance Metrics

IDECM Block 4: ALQ-214 FRP 14-16 contract awarded 4th Qtr. FY 2017. FRP-15 option contract planned for 2nd Qtr. FY 2018. ALQ-214 FRP 14-16 is a Sole Source Firm Fixed Price (SS/FFP) contract with a base plus 2 options to Harris.

ALQ-214 Software Improvement: Successfully achieve Fleet Release in 3rd Qtr. FY 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 2175 / *Tactical Air Electronic Warfare*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft Integration - IDECM Boeing	Various	Various : Various	7.519	0.000		0.000		0.000		-		0.000	0.000	7.519	7.519
Systems Eng - IDECM	SS/CPFF	Various : Various	64.169	0.000		0.000		0.000		-		0.000	0.000	64.169	64.169
Adaptive Radar Countermeasures (ARC) Development	SS/CPFF	Harris : Clifton, NJ	0.000	0.000		0.000		8.487	Dec 2018	-		8.487	67.166	75.653	75.653
Dual Band Decoy Development	TBD	TBD : TBD	0.000	0.000		0.000		26.076	May 2019	-		26.076	88.202	114.278	114.278
Prior Year Prod Dev costs no longer funded in FYDP	Various	Various : Various	236.024	0.000		0.000		0.000		-		0.000	0.000	236.024	-
		Subtotal	307.712	0.000		0.000		34.563		-		34.563	155.368	497.643	N/A

Remarks

ALQ-214 Adaptive Radar Countermeasures (ARC) Development, Integration and Test will begin in FY 2019 and continue into FY 2023. Dual Band Dual Band Decoy Development, Integration and Test will begin in FY 2019 and continue through FY 2023.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Log Supt - IDECM	WR	NAWCAD : Pax River, MD	0.309	0.000		0.114	Nov 2017	0.115	Nov 2018	-		0.115	0.841	1.379	-
Integrated Log Supt - IDECM	SS/CPFF	WYLE : Pax River, MD	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	0.050
Software Dev-ALQ - 214 SW Dev	SS/CPFF	Harris : Clifton, NJ	26.887	0.988	Aug 2017	0.000		0.000		-		0.000	0.000	27.875	27.875
Engineering Support	WR	Various : Various	2.068	0.250	Dec 2016	1.334	Nov 2017	1.119	Nov 2018	-		1.119	8.155	12.926	-
Engineering Support	WR	NAWCWD : China Lake, CA	0.971	0.000		0.000		0.000		-		0.000	0.000	0.971	-
Engineering Support	WR	NAWCWD : Point Mugu, CA	4.026	0.868	Feb 2017	0.000		0.000		-		0.000	0.000	4.894	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies and Analysis SW Dev	SS/CR	Johns Hopkins : Baltimore, MD	1.473	0.100	Mar 2017	0.000		0.000		-		0.000	0.000	1.573	1.573
Engineering Support ARC	WR	Various : Various	0.000	0.000		0.000		2.551	Nov 2018	-		2.551	21.879	24.430	-
Engineering Support Dual Band Decoy	WR	Various : Various	0.000	0.000		0.000		5.724	Nov 2018	-		5.724	48.547	54.271	-
Prior Year Support costs no longer funded in FYDP	Various	Various : Various	10.307	0.000		0.000		0.000		-		0.000	0.000	10.307	-
		Subtotal	46.091	2.206		1.448		9.509		-		9.509	79.422	138.676	N/A

Remarks

Software Dev - ALQ-214 SW Dev. Software Development challenges required additional funding to complete the effort.
ALQ-214 ARC Development, Integration and Test will begin in FY 2019 and continue into FY 2023.
Dual Band Decoy Development, Integration and Test will begin in FY 2019 and continue through FY 2023.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev Test & Eval Supt ALQ-214 SW Imp	WR	Various : Various	0.420	0.000		0.000		0.000		-		0.000	0.000	0.420	-
Integrated Test & Eval ALQ-214 SW Imp	WR	NAWCWD : China Lake, CA	0.952	0.000		0.000		0.000		-		0.000	0.000	0.952	-
Dev Test & Eval Supt ALQ-214 SW Imp	WR	NAWCWD : China Lake, CA	9.573	2.962	Feb 2017	0.000		0.000		-		0.000	0.000	12.535	-
Dev Test & Eval Supt ALQ-214 SW IMP	WR	NAWCWD : Point Mugu, CA	0.854	1.356	Feb 2017	0.000		0.000		-		0.000	0.000	2.210	-
Oper Test & Eval IDECM	WR	NAWCWD : China Lake, CA	2.737	0.000		0.000		0.000		-		0.000	0.000	2.737	-
Eng Test & Eval IDECM	WR	Various : Various	2.611	0.046	Dec 2016	0.434	Nov 2017	0.438	Nov 2018	-		0.438	3.189	6.718	-
Eng & Tech Srvcs (Non-FFRDC)	SS/CPFF	Various : Various	2.043	0.410	Dec 2016	0.153	Dec 2017	0.000		-		0.000	0.500	3.106	3.106
Dev Test & Eval Supt ARC	WR	Various : Various	0.000	0.000		0.000		0.250	Dec 2018	-		0.250	7.379	7.629	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 2175 / *Tactical Air Electronic Warfare*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Test & Eval ARC	WR	Various : Various	0.000	0.000		0.000		0.250	Dec 2018	-		0.250	6.465	6.715	-
Oper Test & Eval ARC	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	3.286	3.286	-
Oper Test & Eval ARC (VX-9)	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	13.143	13.143	-
Dev Test & Eval Supt Dual Band Decoy	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	25.662	25.662	-
Integrated Test & Eval Dual Band Decoy	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	12.904	12.904	-
Oper Test & Eval Dual Band Decoy	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	11.300	11.300	-
Oper Test & Eval DBD (VX-9)	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	13.000	13.000	-
Prior Year T&E costs no longer funded in FYDP	WR	Various : Various	26.007	0.000		0.000		0.000		-		0.000	0.000	26.007	-
		Subtotal	45.197	4.774		0.587		0.938		-		0.938	96.828	148.324	N/A

Remarks

Additional Developmental Test & Evaluation for SWIP support will continue at both China Lake and Point Mugu in FY 2017 and FY 2018.
ALQ-214 ARC Development, Integration and Test will begin in FY 2019 and continue into FY 2023.
Dual Band Decoy Development, Integration and Test will begin in FY 2019 and continue through FY 2023.

Management Services ($ in Millions)

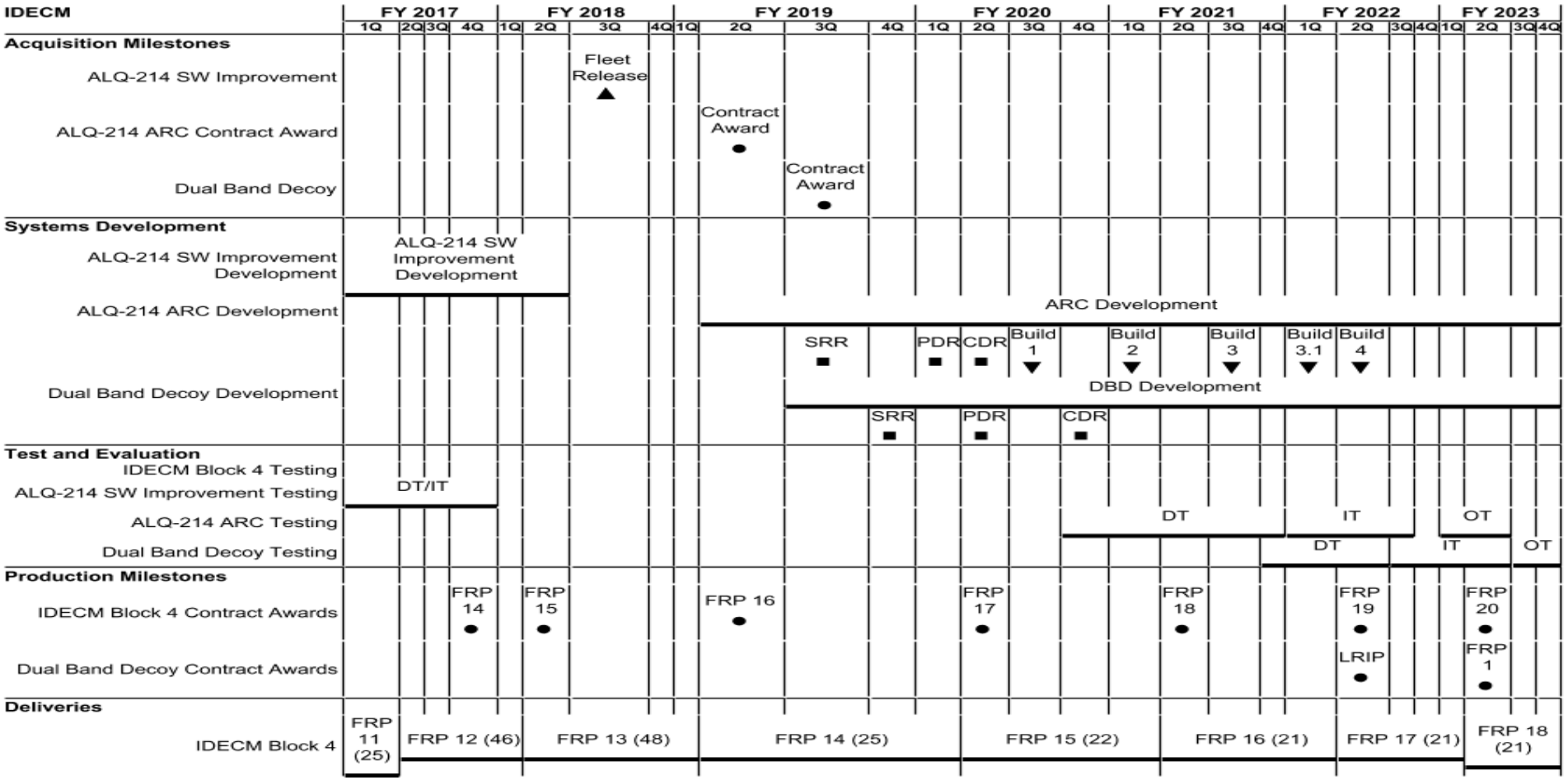
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	NAWCAD : Pax River, MD	0.836	0.035	Oct 2016	0.062	Oct 2017	0.064	Oct 2018	-		0.064	0.502	1.499	-
Prior Year Mgmt costs no longer funded in FYDP	Various	Various : Various	88.935	0.000		0.000		0.000		-		0.000	0.000	88.935	-
		Subtotal	89.771	0.035		0.062		0.064		-		0.064	0.502	90.434	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 2175 / *Tactical Air Electronic Warfare*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	488.771	7.015		2.097		45.074		-		45.074	332.120	875.077	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*



2019PB - 0604270N - 2175 IDECM Block 4 is an ECP to Block 2

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
IDECM				
Acquisition Milestones: ALQ-214 SW Improvement: ALQ-214 SW Improvement Fleet Release	3	2018	3	2018
Acquisition Milestones: ALQ-214 ARC Contract Award: ALQ-214 ARC Contract Award	2	2019	2	2019
Acquisition Milestones: Dual Band Decoy: Dual Band Decoy Contract Award	3	2019	3	2019
Systems Development: ALQ-214 SW Improvement Development: ALQ-214 SW Improvement Development	1	2017	2	2018
Systems Development: ALQ-214 ARC Development: ARC Development	2	2019	4	2023
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Systems Requirements Review	3	2019	3	2019
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Preliminary Design Review	1	2020	1	2020
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Critical Design Review	2	2020	2	2020
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Build 1	3	2020	3	2020
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Build 2	1	2021	1	2021
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Build 3	3	2021	3	2021
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Build 3.1	1	2022	1	2022
Systems Development: ALQ-214 ARC Development: ALQ-214 ARC Build 4	2	2022	2	2022
Systems Development: Dual Band Decoy Development: DBD Development	3	2019	4	2023
Systems Development: Dual Band Decoy Development: DBD Systems Requirements Review	4	2019	4	2019
Systems Development: Dual Band Decoy Development: DBD Preliminary Design Review	2	2020	2	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Dual Band Decoy Development: DBD Critical Design Review	4	2020	4	2020
Test and Evaluation: ALQ-214 SW Improvement Testing: ALQ-214 SW Improvement Development Testing (DT)/Integrated Testing (IT)	1	2017	4	2017
Test and Evaluation: ALQ-214 ARC Testing: ALQ-214 ARC Developmental Testing	4	2020	4	2021
Test and Evaluation: ALQ-214 ARC Testing: ALQ-214 ARC Integrated Testing	1	2022	3	2022
Test and Evaluation: ALQ-214 ARC Testing: ALQ-214 ARC Operational Testing	1	2023	2	2023
Test and Evaluation: Dual Band Decoy Testing: DBD Developmental Testing	4	2021	2	2022
Test and Evaluation: Dual Band Decoy Testing: DBD Integrated Testing	3	2022	2	2023
Test and Evaluation: Dual Band Decoy Testing: DBD Operational Testing	3	2023	4	2023
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 14	4	2017	4	2017
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 15	2	2018	2	2018
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 16	2	2019	2	2019
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 17	2	2020	2	2020
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 18	2	2021	2	2021
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 19	2	2022	2	2022
Production Milestones: IDECM Block 4 Contract Awards: IDECM Block 4 Full-Rate Production (FRP) 20	2	2023	2	2023
Production Milestones: Dual Band Decoy Contract Awards: DBD Low Rate Initial Production	2	2022	2	2022
Production Milestones: Dual Band Decoy Contract Awards: DBD Full Rate Production One	2	2023	2	2023
Deliveries: IDECM Block 4: IDECM Block 4 FRP 11 Deliveries (25)	1	2017	1	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 2175 / *Tactical Air Electronic Warfare*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: IDECM Block 4: IDECM Block 4 FRP 12 Deliveries (46)	2	2017	1	2018
Deliveries: IDECM Block 4: IDECM Block 4 FRP 13 Deliveries (48)	2	2018	1	2019
Deliveries: IDECM Block 4: IDECM Block 4 FRP 14 Deliveries (25)	2	2019	1	2020
Deliveries: IDECM Block 4: IDECM Block 4 FRP 15 Deliveries (22)	2	2020	1	2021
Deliveries: IDECM Block 4: IDECM Block 4 FRP 16 Deliveries (21)	2	2021	1	2022
Deliveries: IDECM Block 4: IDECM Block 4 FRP 17 Deliveries (21)	2	2022	1	2023
Deliveries: IDECM Block 4: IDECM Block 4 FRP 18 Deliveries (21)	2	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3308 / *Technology Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3308: *Technology Development*	0.000	0.000	2.286	6.108	-	6.108	6.219	8.476	8.634	8.817	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

PE 0604279N consolidated to PE 0604270N beginning in FY 2017.

A. Mission Description and Budget Item Justification

Project Unit 3308 / Technology Development funds efforts that focus on the quick reaction prototyping and fielding of Tactical Electronic Warfare (EW)/countermeasures solutions for increased survivability providing friendly forces the self-protection necessary for successful mission accomplishment. Significant investments have been made in the modular hardware and reprogrammable software resident in Aircraft Survivability Equipment (ASE)/capability which is fielded today. Technology Development leverages these investments, addressing the effectiveness of ASE systems through technology maturation/insertion, countermeasure/jammer/receiver algorithm development, threat data file and model updates as modern threats continue to evolve. These updated data files and algorithms can be deployed within hours of release by squadron maintenance personnel to aircraft while still on the ramp or flight deck. This program directly addresses the operational requirement of Strike survivability platforms for optimization of EW/countermeasure solutions across the Department of Navy.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Technology Development	0.000	2.286	6.108	0.000	6.108
Articles:	-	-	-	-	-
FY 2018 Plans: Continue EW vulnerability studies/analysis, product development and test conducted for strike aircraft.					
FY 2019 Base Plans: Perform EW vulnerability studies/analysis, product development and test conducted for strike aircraft. Develop, model and test advanced electronic countermeasure algorithms for strike aircraft to defend against modern threats both inside and outside the currently protected RF spectrum.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase of $3.822 Million due to emerging threats outside currently protected RF spectrum. This requires additional algorithms development and testing.					
Accomplishments/Planned Programs Subtotals	0.000	2.286	6.108	0.000	6.108

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Electronic Warfare/vulnerability studies/analysis, product development and test conducted for strike aircraft across the Future Years Defense Program (FYDP).

E. Performance Metrics

Electronic Warfare (EW) vulnerability studies/analysis, product development and test conducted for strike aircraft across the FYDP. Updated Threat Models and Algorithms are released in EW Suite Updates and posted to Naval Data Distribution System (NDDS). Once available on NDDS, Fleet Maintainers download and install the EW Suite to all applicable aircraft.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3308 / *Technology Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Dev - ALQ-214 SW Dev	WR	NAWCWD : Point Mugu, CA	0.000	0.000		0.700	Nov 2017	2.931	Nov 2018	-		2.931	Continuing	Continuing	Continuing
Software Dev - ALQ-214 SW Dev	WR	Various : Various	0.000	0.000		0.328	Nov 2017	1.050	Nov 2018	-		1.050	Continuing	Continuing	Continuing
Software Dev - ALQ-214 SW Dev	C/CPFF	Johns Hopkins : Baltimore, MD	0.000	0.000		0.000		0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		1.028		4.231		-		4.231	Continuing	Continuing	N/A

Remarks

FY 2017 Technology Development unjustified new start. Zero funding received.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Evaluation	WR	NAWCWD : Point Mugu, CA	0.000	0.000		0.933	Nov 2017	1.477	Nov 2018	-		1.477	Continuing	Continuing	Continuing
Engineering & Evaluation	WR	Various : Various	0.000	0.000		0.325	Nov 2017	0.400	Nov 2018	-		0.400	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		1.258		1.877		-		1.877	Continuing	Continuing	N/A

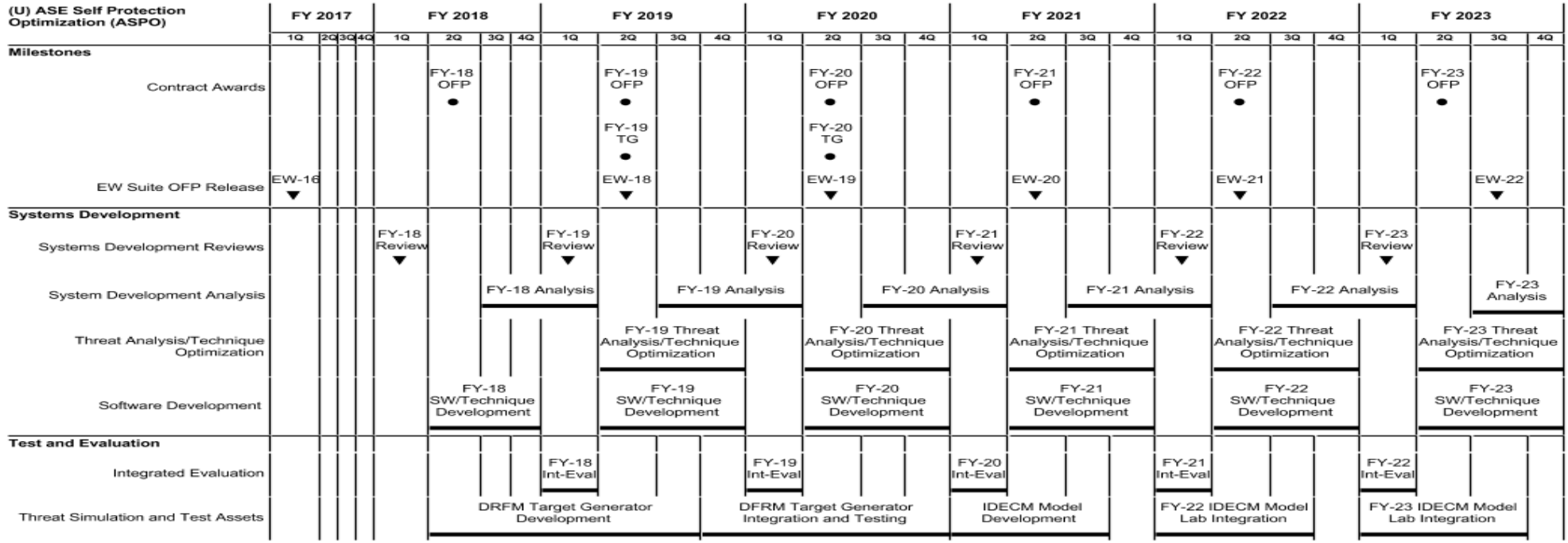
Remarks

FY 2017 Technology Development unjustified new start. Zero funding received.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		2.286		6.108		-		6.108	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*



2019PB - 0604270N - 3308

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
(U) ASE Self Protection Optimization (ASPO)				
Milestones: Contract Awards: FY-18 Operational Flight Program	2	2018	2	2018
Milestones: Contract Awards: FY-19 Operational Flight Program	2	2019	2	2019
Milestones: Contract Awards: FY-20 Operational Flight Program	2	2020	2	2020
Milestones: Contract Awards: FY-21 Operational Flight Program	2	2021	2	2021
Milestones: Contract Awards: FY-22 Operational Flight Program	2	2022	2	2022
Milestones: Contract Awards: FY-23 Operational Flight Program	2	2023	2	2023
Milestones: Contract Awards: FY-19 Target Generator	2	2019	2	2019
Milestones: Contract Awards: FY-20 Target Generator	2	2020	2	2020
Milestones: EW Suite OFP Release: Release-16	1	2017	1	2017
Milestones: EW Suite OFP Release: Release-18	2	2019	2	2019
Milestones: EW Suite OFP Release: Release-19	2	2020	2	2020
Milestones: EW Suite OFP Release: Release-20	2	2021	2	2021
Milestones: EW Suite OFP Release: Release-21	2	2022	2	2022
Milestones: EW Suite OFP Release: Release-22	3	2023	3	2023
Systems Development: Systems Development Reviews: FY-18 Review	1	2018	1	2018
Systems Development: Systems Development Reviews: FY-19 Review	1	2019	1	2019
Systems Development: Systems Development Reviews: FY-20 Review	1	2020	1	2020
Systems Development: Systems Development Reviews: FY-21 Review	1	2021	1	2021
Systems Development: Systems Development Reviews: FY-22 Review	1	2022	1	2022
Systems Development: Systems Development Reviews: FY-23 Review	1	2023	1	2023
Systems Development: System Development Analysis: FY-18 Analysis	3	2018	1	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: System Development Analysis: FY-19 Analysis	3	2019	1	2020
Systems Development: System Development Analysis: FY-20 Analysis	3	2020	1	2021
Systems Development: System Development Analysis: FY-21 Analysis	3	2021	1	2022
Systems Development: System Development Analysis: FY-22 Analysis	3	2022	1	2023
Systems Development: System Development Analysis: FY-23 Analysis	3	2023	4	2023
Systems Development: Threat Analysis/Technique Optimization: FY-19 Threat Analysis/Technique Optimization	2	2019	4	2019
Systems Development: Threat Analysis/Technique Optimization: FY-20 Threat Analysis/Technique Optimization	2	2020	4	2020
Systems Development: Threat Analysis/Technique Optimization: FY-21 Threat Analysis/Technique Optimization	2	2021	4	2021
Systems Development: Threat Analysis/Technique Optimization: FY-22 Threat Analysis/Technique Optimization	2	2022	4	2022
Systems Development: Threat Analysis/Technique Optimization: FY-23 Threat Analysis/Technique Optimization	2	2023	4	2023
Systems Development: Software Development: FY-18 SW/Technique Development	2	2018	4	2018
Systems Development: Software Development: FY-19 SW/Technique Development	2	2019	4	2019
Systems Development: Software Development: FY-20 SW/Technique Development	2	2020	4	2020
Systems Development: Software Development: FY-21 SW/Technique Development	2	2021	4	2021
Systems Development: Software Development: FY-22 SW/Technique Development	2	2022	4	2022
Systems Development: Software Development: FY-23 SW/Technique Development	2	2023	4	2023
Test and Evaluation: Integrated Evaluation: FY-18 Integrated Evaluation	1	2019	1	2019
Test and Evaluation: Integrated Evaluation: FY-19 Integrated Evaluation	1	2020	1	2020
Test and Evaluation: Integrated Evaluation: FY-20 Integrated Evaluation	1	2021	1	2021
Test and Evaluation: Integrated Evaluation: FY-21 Integrated Evaluation	1	2022	1	2022
Test and Evaluation: Integrated Evaluation: FY-22 Integrated Evaluation	1	2023	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3308 / *Technology Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test and Evaluation: Threat Simulation and Test Assets: Digital Radio Frequency Memory (DFRM) Target Generator Development	2	2018	3	2019
Test and Evaluation: Threat Simulation and Test Assets: DFRM Target Generator Integration and Testing	4	2019	4	2020
Test and Evaluation: Threat Simulation and Test Assets: IDECM Model Development	1	2021	3	2021
Test and Evaluation: Threat Simulation and Test Assets: FY-22 IDECM Model Lab Integration	1	2022	3	2022
Test and Evaluation: Threat Simulation and Test Assets: FY-23 IDECM Model Lab Integration	1	2023	3	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3309 / *Assault Survivability Optimization*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3309: *Assault Survivability Optimization*	0.000	3.484	0.851	0.836	-	0.836	0.827	0.850	0.867	0.886	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

PE 0604279N consolidated to PE 0604270N beginning in FY 2017. PE 0604279N PU 3309 All Prior Years is $21.566M.

A. Mission Description and Budget Item Justification

Program was established to fill aircraft survivability gaps against current and future threat systems. This project addresses the Air Expendable Countermeasures (AECM) requirement maintaining a portfolio of countermeasures capable of defeating current and advancing surface-to-air and air-to-air threat missile systems to include the development, testing, and rapid fielding of advanced countermeasures and enhanced employment techniques needed to support operations. Countermeasure dispensing techniques are developed using capability advancements tied to Aircraft Survivability Equipment (ASE) investments already made by sharing sensor data available in the ASE Suite. Improved countermeasure dispense techniques are rapidly delivered to operational Fleet aircraft thru Mission Data File updates via established software update processes. Also, new expendable countermeasure technology developed in industry, by other DoD Components and through other R&D programs can be transitioned to AECM Program of Record meet the required operational platform survivability without further investment in ASE systems. Resources will be applied to the following areas:

1) Studies and evaluations to optimize employment of current countermeasures and ASE capabilities.
2) Development and demonstration of advanced expendable countermeasures and countermeasure techniques.
3) Testing and evaluation of advanced countermeasures.
4) Development of system software enhancements and integration for the testing and deployment of advanced countermeasure techniques.
5) Development of and upgrades to modeling tools and specialized equipment required to conduct evaluation of advanced countermeasures against proliferating threats.

Advanced countermeasures procured in FY 2016 (PE 0604279N) will support flight test for optimized countermeasures tniques in FY 2017.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Assault Survivability Optimization	3.484	0.851	0.836	0.000	0.836
Articles:	480	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue development and testing of advanced countermeasure techniques and upgrade specialized evaluation equipment for advancing threat systems. Perform modeling and simulation and effectiveness flight testing for MH-60R. ***FY 2019 Base Plans:*** Continue development and testing of advanced countermeasure techniques and upgrade specialized evaluation equipment for advancing threat systems. Perform modeling and simulation and effectiveness flight testing. Aircraft selected for optimization flight testing will be prioritized through coordination with Marine Aviation Weapons and Tactics Squadron (MAWTS). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2018 to FY 2019 decrease based on program funding profile established during FY 2015 budget cycle.					
Accomplishments/Planned Programs Subtotals	3.484	0.851	0.836	0.000	0.836

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Acquisition strategy is to leverage improvements in air expendable countermeasures technology and integration of existing Aircraft Survivability Equipment (ASE) sensor data to enhance platform survivability on United States Navy and United States Marine Corps platforms through more effective dispense techniques, investing in enhancements in modeling and simulation tools to better evaluate countermeasure effectiveness, upgrading test and evaluation equipment to incorporate current and future threats for effectiveness tests and developing and demonstrating advanced concept countermeasures for future threats. Advanced countermeasures procured in FY16 will support flight test for optimized/advanced countermeasure techniques in FY17. New advanced countermeasures are then transitioned to the Procurement of Ammunition Navy and Marine Corps appropriation for procurement and fielding. New optimized and advanced countermeasure techniques are delivered to government software support activities for fleet release to increase aircraft/aircrew survivability.

E. Performance Metrics

Maintain AECM ORD: #512-88-89 dated 28 May 1999 requirement to provide operationally effective mixture of countermeasures that can be employed to degrade and/or neutralize the effectiveness of current and projected Electro Optic (EO), Infrared (IR), Radio Frequency (RF) and Ultra-violet (UV) threat missile systems. Continued development of optimized countermeasure techniques and advance countermeasures by on-going analysis and test flight efforts related to aircraft platform survivability

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

based on threat development and proliferation. Testing of countermeasure techniques developed for improved survivability is supported by Statement of Functionality for Aircraft Survivability Equipment Smart Dispense, dated 19 January 2012. Project Unit 3309 efforts will continue due to threat proliferation, continued advances in countermeasures technology and fielding of integrated ASE capability advancements within the EO, IR, RF and UV spectrums. Project will include efforts to satisfy Department of Navy aircraft self-protection against Man-Portable Air Defense Systems (MANPADs), including accelerated proliferation of threat addressed in JUONS #SO-0010.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3309 / *Assault Survivability Optimization*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Expendable Countermeasure Technique Modeling and Simulation	WR	NSWC Crane : Crane, IN	0.000	0.773	Oct 2016	0.397	Oct 2017	0.404	Oct 2018	-		0.404	Continuing	Continuing	Continuing
Radio Frequency Countermeasures Modeling and Simulation	WR	NSWC Crane : Crane, IN	0.000	0.519	Oct 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Radio Frequency Countermeasures Modeling and Simulation	C/CPFF	Booz Allen Hamiliton : McClean, VA	0.000	0.114	Mar 2017	0.000		0.000		-		0.000	0.000	0.114	0.114
Radio Frequency Countermeasures Modeling and Simulation	C/CPFF	Georgia Tech Research Institute : Atlanta, GA	0.000	0.080	Jun 2017	0.000		0.000		-		0.000	0.000	0.080	0.079
1x1x8 Expendable Countermeasure Technique Modeling and Simulation	WR	NSWC Crane : Crane, IN	0.000	0.070	Sep 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	1.556		0.397		0.404		-		0.404	Continuing	Continuing	N/A

Remarks

Modeling and simulation funding supports the development of advanced countermeasure techniques prior to flight test. Initiated modeling and simulation to determine applicability of 1x1x8 countermeasures on MH-60. PE 0604279N PU 3309 Product Development All Prior Years is $9.886M

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Mission Data File Software Development	WR	FRCSE : Jacksonville, FL	0.000	0.240	Nov 2016	0.070	Jan 2018	0.071	Dec 2018	-		0.071	Continuing	Continuing	Continuing
		Subtotal	0.000	0.240		0.070		0.071		-		0.071	Continuing	Continuing	N/A

Remarks

Software development funding supports the creation of Mission Data Files (MDF) and enhanced operational flight program algorithms for flight effectiveness testing. PE 0604279N PU 3309 Support All Prior Years is $4.032M

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental T&E Flight Tests	WR	Various : Various	0.000	0.679	Apr 2017	0.272	Jun 2018	0.271	Mar 2019	-		0.271	Continuing	Continuing	Continuing
Advanced Countermeasures for Flight Tests	MIPR	Alloy Services Company Inc : Chester Township, PA	0.000	0.185	Mar 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Seeker Test Van Advanced Threat Capability	MIPR	Green Mountain Research : Huntsville, AL	0.000	0.261	Jan 2017	0.000		0.000		-		0.000	0.000	0.261	0.261
Engineering, Evaluation and Testing for Advanced Countermeasures	WR	NSWC Crane : Crane, IN	0.000	0.252	Jan 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1x1x8 Engineering and Evaluaion	WR	NSWC Crane : Crane, IN	0.000	0.070	Sep 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
1x1x8 Engineering and Evaluaion	C/CPFF	Georgia Tech Research Institute : Atlanta, GA	0.000	0.139	Jan 2018	0.012	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	1.586		0.284		0.271		-		0.271	Continuing	Continuing	N/A

Remarks

Advanced expendable countermeasures procured in FY 2017 will support flight effectiveness testing /optimization flight tests in FY 2018. Developmental T&E flight test following modeling and simulation evaluation in FY 2018 will optimize expendable countermeasure effectiveness for MH-60R aircraft using 480 test articles procured in FY 2017. Developmental T&E flight test following modeling and simulation evaluation in FY 2019 will optimize expendable countermeasure effectiveness for aircraft using countermeasures received via non-combat expenditure allocation. Aircraft will be identified via coordination with Marine Aviation Weapons and Tactics Squadron (MAWTS). Initiated engineering and evaluation to determine applicability of 1x1x8 countermeasures on Navy aircraft platforms. PE 0604279N PU 3309 Test and Evaluation All Prior Years is $7.548M

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management	WR	FRCSE : Jacksonville, FL	0.000	0.102	Oct 2016	0.100	Oct 2017	0.090	Oct 2018	-		0.090	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.000	0.102		0.100		0.090		-		0.090	Continuing	Continuing	N/A

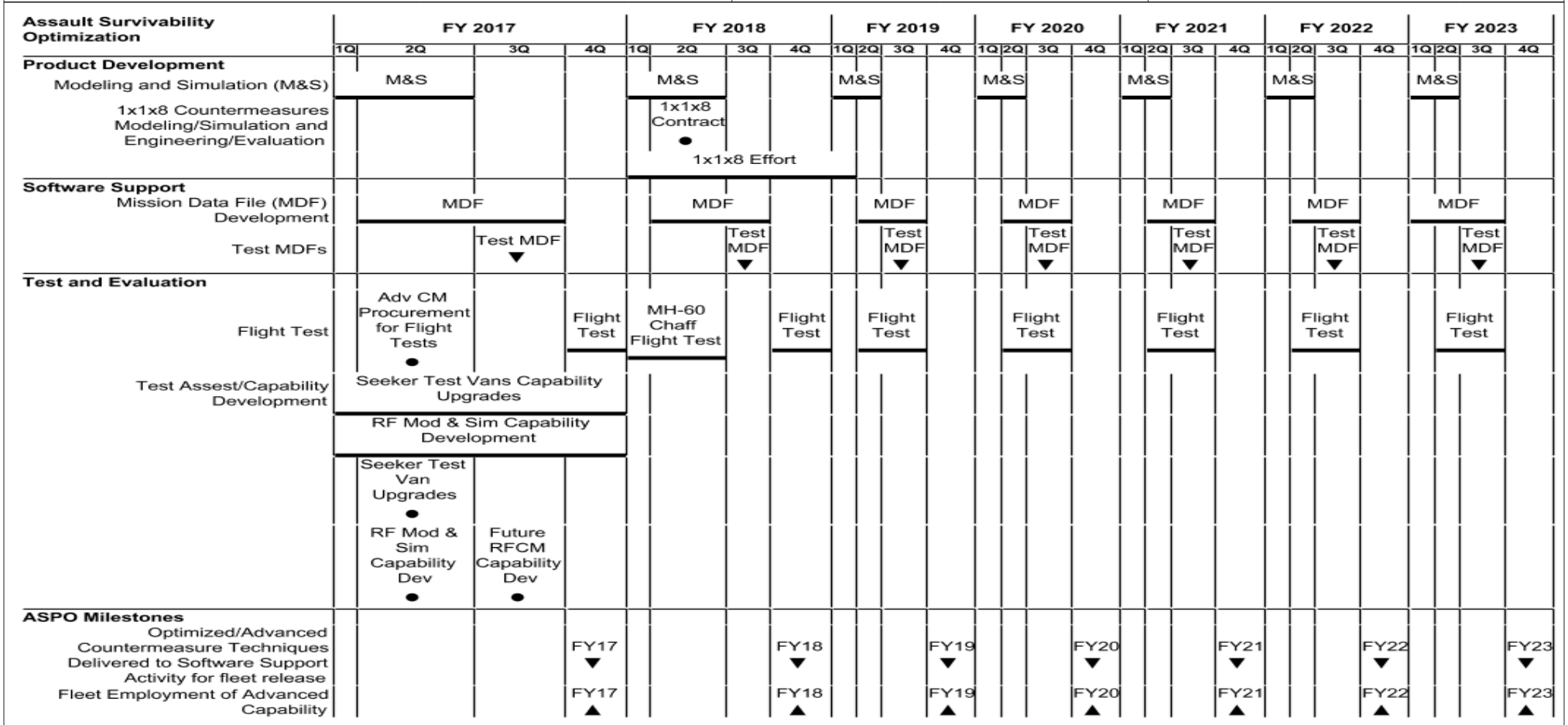
Remarks

Project management required to coordinate increased development activities. PE 0604279N PU 3309 Management Services All Prior Years is $0.100M

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	3.484		0.851		0.836		-		0.836	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*



2019PB - 0604270N - 3309 Project 3309 moved from PE 0604279N to PE 0604270N in FY 2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Assault Survivability Optimization				
Product Development: Modeling and Simulation (M&S): FY17 Modeling and Simulation	1	2017	2	2017
Product Development: Modeling and Simulation (M&S): FY18 Modeling and Simulation	1	2018	2	2018
Product Development: Modeling and Simulation (M&S): FY19 Modeling and Simulation	1	2019	2	2019
Product Development: Modeling and Simulation (M&S): FY20 Modeling and Simulation	1	2020	2	2020
Product Development: Modeling and Simulation (M&S): FY21 Modeling and Simulation	1	2021	2	2021
Product Development: Modeling and Simulation (M&S): FY22 Modeling and Simulation	1	2022	2	2022
Product Development: Modeling and Simulation (M&S): FY23 Modeling and Simulation	1	2023	2	2023
Product Development: 1x1x8 Countermeasures Modeling/Simulation and Engineering/ Evaluation: 1x1x8 Countermeasures Modeling/Simulation and Engineering/Evaluation Contract Award	2	2018	2	2018
Product Development: 1x1x8 Countermeasures Modeling/Simulation and Engineering/ Evaluation: 1x1x8 Countermeasures Modeling/Simulation and Engineering/Evaluation	1	2018	1	2019
Software Support: Mission Data File (MDF) Development: FY17 Mission Data Files Development	2	2017	3	2017
Software Support: Mission Data File (MDF) Development: FY18 Mission Data Files Development	2	2018	3	2018
Software Support: Mission Data File (MDF) Development: FY19 Mission Data Files Development	2	2019	3	2019
Software Support: Mission Data File (MDF) Development: FY20 Mission Data Files Development	2	2020	3	2020
Software Support: Mission Data File (MDF) Development: FY21 Mission Data Files Development	2	2021	3	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Software Support: Mission Data File (MDF) Development: FY22 Mission Data Files Development	2	2022	3	2022
Software Support: Mission Data File (MDF) Development: FY23 Mission Data Files Development	1	2023	3	2023
Software Support: Test MDFs: FY17 Test Mission Data Files	3	2017	3	2017
Software Support: Test MDFs: FY18 Test Mission Data Files	3	2018	3	2018
Software Support: Test MDFs: FY19 Test Mission Data Files	3	2019	3	2019
Software Support: Test MDFs: FY20 Test Mission Data Files	3	2020	3	2020
Software Support: Test MDFs: FY21 Test Mission Data Files	3	2021	3	2021
Software Support: Test MDFs: FY22 Test Mission Data Files	3	2022	3	2022
Software Support: Test MDFs: FY23 Test Mission Data Files	3	2023	3	2023
Test and Evaluation: Flight Test: Advanced Countermeasure Procurement for Flight Tests	2	2017	2	2017
Test and Evaluation: Flight Test: FY17 Flight Test	4	2017	4	2017
Test and Evaluation: Flight Test: FY18 Flight Test	4	2018	4	2018
Test and Evaluation: Flight Test: Advanced Chaff Flight Test	1	2018	2	2018
Test and Evaluation: Flight Test: FY19 Flight Test	2	2019	3	2019
Test and Evaluation: Flight Test: FY20 Flight Test	2	2020	3	2020
Test and Evaluation: Flight Test: FY21 Flight Test	2	2021	3	2021
Test and Evaluation: Flight Test: FY22 Flight Test	2	2022	3	2022
Test and Evaluation: Flight Test: FY23 Flight Test	2	2023	3	2023
Test and Evaluation: Test Assest/Capability Development: Seeker Test Vans Capability Upgrades	1	2017	4	2017
Test and Evaluation: Test Assest/Capability Development: RF Mod & Sim Capability Development	1	2017	4	2017
Test and Evaluation: Test Assest/Capability Development: FY17 Seeker Test Van Upgrade Contract Award	2	2017	2	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test and Evaluation: Test Assest/Capability Development: RF Mod & Sim Capability Development Contract Award, Booz Allen Hamilton	2	2017	2	2017
Test and Evaluation: Test Assest/Capability Development: Future RFCM capabilities development Contract Award, Georgia Tech Research Institute	3	2017	3	2017
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY17 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2017	4	2017
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY18 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2018	4	2018
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY19 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2019	4	2019
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 20 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2020	4	2020
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 21 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2021	4	2021
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 22 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2022	4	2022
ASPO Milestones: Optimized/Advanced Countermeasure Techniques Delivered to Software Support Activity for fleet release: FY 23 Optimized/Advanced CM Techniques Delivered to SSA for fleet release	4	2023	4	2023
ASPO Milestones: Fleet Employment of Advanced Capability: FY17 Fleet Employment of Advanced Capability	4	2017	4	2017
ASPO Milestones: Fleet Employment of Advanced Capability: FY18 Fleet Employment of Advanced Capability	4	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3309 / *Assault Survivability Optimization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ASPO Milestones: Fleet Employment of Advanced Capability: FY19 Fleet Employment of Advanced Capability	4	2019	4	2019
ASPO Milestones: Fleet Employment of Advanced Capability: FY20 Fleet Employment of Advanced Capability	4	2020	4	2020
ASPO Milestones: Fleet Employment of Advanced Capability: FY21 Fleet Employment of Advanced Capability	4	2021	4	2021
ASPO Milestones: Fleet Employment of Advanced Capability: FY22 Fleet Employment of Advanced Capability	4	2022	4	2022
ASPO Milestones: Fleet Employment of Advanced Capability: FY23 Fleet Employment of Advanced Capability	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3327 / *MAGTF EW Aviation Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3327: *MAGTF EW Aviation Development*	0.000	16.115	29.643	18.562	-	18.562	13.272	4.849	4.606	14.494	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

PE 0604376M was consolidated to PE 0604270N beginning in FY 2017.

A. Mission Description and Budget Item Justification

This project unit supports the United States Marine Corps (USMC) development of Marine Air Ground Task Force (MAGTF) Electronic Warfare (EW) and the various elements of its distributed System of Systems (SoS) that support the Commandant of the Marine Corps' Strategy and Vision 2025 and Joint Vision 2025. The SoS will address MAGTF EW sufficiency gaps in the areas of Electronic Attack (EA), EW Support (ES), and Electronic Protection with a multitude of payloads designed for carriage on a variety of organic MAGTF air and ground assets. Payload development plans follow an adaptable, modular and open architecture philosophy to combat the increasing capability gap and enable future growth at a reduced operational and sustainment cost. A key element to this capability is the AN/ALQ-231 Intrepid Tiger II program.

The AN/ALQ-231(V)1 pod is the Fixed-Wing variant of the Intrepid Tiger II pod flown on the AV-8B and F/A-18A-D platforms, with plans for future integration on MV-22, C-130, and CH-53K platforms. The AN/ALQ-231(V)2 will be the variant of the Intrepid Tiger II pod flown on unmanned aerial vehicle (UAV) platforms once integration is complete. The AN/ALQ-231(V)3 is the Rotary-Wing variant of the Intrepid Tiger II pod flown on the UH-1Y platform, with plans for future integration on AH-1 platforms. Beginning in FY18, MAGTF EW will also commence efforts to develop an EW Payload for USMC Unmanned Aircraft System (UAS) platforms capable of conducting, supporting, and coordinating Electro-Magnetic Spectrum (EMS) operations in the form of EA and ES against Irregular Warfare threats. Additionally, this payload will be scalable and adaptable for emerging threats and will be interoperable with the USMC's Electronic Warfare Services Architecture (EWSA). This new capability will be integrated for MAGTF tactical coordination of cyberspace and EW operations via the Cyber Electronic Warfare Coordination Cell (CEWCC). Host platforms include, but are not limited to, the RQ-21A.

The FY 2019 funding request was reduced by $2.668 million to account for the availability of prior year execution balances.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Intrepid Tiger II (AN/ALQ-231)	16.115	21.143	9.797	0.000	9.797
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continuing efforts include develop and test of Intrepid Tiger II based solutions to radar threats in support of the AN/ALQ-231(V)1 BLK X Radar Jammer payload for use on the MV-22, AV-8B, and F/A-18C/D platforms, with compatibility for follow-on integration on C-130 and CH-53K. Updates to major components of the AN/ALQ-231 to address this new threat set commenced in FY 2017. FY 2018 efforts will include competitive prototyping and lab and ground developmental testing of evaluated technologies leading to the down-select of a single Engineering Development Model (EDM) functional design for Critical Design Review (CDR) for both a modular pod shell and a cabin rack-mounted solution. Following CDR, efforts will focus on integrated developmental testing of the cabin rack-mounted solution for the MV-22. The program will continue software development efforts that commenced in FY 2017. Additionally, development of the EWSA in support of increased Intrepid Tiger II targets and missions continues in FY 2018. ***FY 2019 Base Plans:*** The program will continue efforts to develop, mature, and test Intrepid Tiger II based solutions to radar threats in support of the penetrating jammer mission with plans to release variants of the AN/ALQ-231(V)1 BLK X Radar Jammer for use on the MV-22, AV-8B, and F/A-18C/D platforms, as well as for future use on the C-130 and CH-53K. FY 2019 efforts will include the continued maturation of BLK X EDM design for both a modular pod shell and a cabin rack-mounted solution and the correction of developmental test deficiencies. In addition, integrated developmental testing of the rack-mounted solution for the MV-22 will be completed and Operational Testing (OT) will commence. The program will also finalize BLK X software development efforts to support OT. Additionally, development of the EWSA in support of evolving Intrepid Tiger II target sets and missions shall continue in FY 2019. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 2018 to FY 2019 due to ramp down of AN/ALQ-231(V)1 BLK X Radar Jammer hardware development as the program continues developmental testing and begins operational test in 2QFY19.					
Title: Unmanned Aircraft System (UAS) Electronic Warfare (EW) Payload	0.000	6.000	6.214	0.000	6.214
Articles:	-	-	-	-	-
FY 2018 Plans: Efforts commencing to develop an EW Payload for USMC UAS platforms. Platforms include, but are not limited to, the RQ-21A. This project will result in an EW payload capable of conducting, supporting, and coordinating EMS operations in the form of electronic attack and electronic surveillance against Irregular Warfare threats.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
This payload will be scalable and adaptable for emerging threats and will be interoperable with the USMC's EWSA. This new capability will be integrated for MAGTF tactical coordination of cyberspace and EW operations via the Cyber CEWCC. ***FY 2019 Base Plans:*** Efforts will continue to develop and test an EW Payload for USMC UAS platforms. Platforms include, but are not limited to, the RQ-21A. This project will result in an EW payload capable of conducting, supporting, and coordinating EMS operations in the form of electronic attack and electronic surveillance against Irregular Warfare threats. This payload will be scalable and adaptable for emerging threats and will be interoperable with the USMC's EWSA. This capability will be integrated for MAGTF tactical coordination of cyberspace and EW operations via the Cyber CEWCC. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY 2018 to FY 2019 due to UAS EW payload hardware and software development and Ground Control Station software update beginning 4QFY19.					
Title: MAGTF EW Jammer Techniques Development	0.000	2.500	2.551	0.000	2.551
Articles:	-	-	-	-	-
FY 2018 Plans: FY 2018 funding increases the Marine Corps' cyberspace and Electronic Warfare expertise via the development of new and updated jammer techniques. These techniques will be designed to exploit the interrelated cyberspace domain and the electromagnetic spectrum (EMS) through the development, validation, and delivery of MAGTF EW-specific Tactics, Techniques, and Procedures (TTPs) and testing of MAGTF EW systems against existing and emerging threats. Additional efforts include the acquisition of simulators to better emulate threshold and objective threats for MAGTF EW systems. ***FY 2019 Base Plans:*** FY 2019 will continue efforts to significantly increase the Marine Corps' cyberspace and Electronic Warfare expertise via the development of new and updated jammer techniques. These techniques will be designed to exploit the interrelated cyberspace domain and the electromagnetic spectrum (EMS) through the development, validation, and delivery of MAGTF EW-specific Tactics, Techniques, and Procedures (TTPs) and testing					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
of MAGTF EW systems against existing and emerging threats. Additional efforts include the acquisition of simulators to better emulate threshold and objective threats for MAGTF EW systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY 2018 to FY 2019 due to inflation rate adjustments in MAGTF EW Jammer Techniques Development.					
Accomplishments/Planned Programs Subtotals	16.115	29.643	18.562	0.000	18.562

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0587: *MAGTF EW For Aviation*	20.544	10.111	11.590	-	11.590	41.230	30.959	33.656	24.428	129.667	398.662

Remarks

D. Acquisition Strategy

This project unit is part of USMC led efforts to ensure Marine Corps requirements are included in the budget process for the Future Year Defense Program and beyond. These efforts include AN/ALQ-231 Intrepid Tiger II(V)1, Intrepid Tiger II(V)2, Intrepid Tiger II(V)3, Collaborative Electronic Warfare (EW)/EW Battle Management, EW Payload, and EW Service Architecture. These programs are the Marine Corps' initial steps to create systems to distribute EW capability across the battle space.

E. Performance Metrics

Continuation of research into Engineering Change Proposals (ECPs) for capability upgrades for AN/ALQ-231(V)1 and AN/ALQ-231(V)3 Intrepid Tiger II pods. Commencement of research to develop an EW payload for USMC Unmanned Aircraft Systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Intrepid Tiger BLK X Hardware Development	WR	NAWCWD : Point Mugu, CA	0.000	4.525	Jan 2017	10.000	Dec 2017	0.965	Nov 2018	-		0.965	Continuing	Continuing	Continuing
UAS EW Payload Hardware Development	WR	NAWCWD : Point Mugu, CA	0.000	0.000		2.548	Mar 2018	1.712	Nov 2018	-		1.712	Continuing	Continuing	Continuing
UAS EW Payload Software Development	WR	NAWCWD : Point Mugu, CA	0.000	0.000		1.323	Mar 2018	1.932	Nov 2018	-		1.932	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.539	Oct 2016	1.805	Dec 2017	0.858	Nov 2018	-		0.858	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : Point Mugu, CA	0.000	9.227	Jan 2017	9.449	Dec 2017	7.003	Nov 2018	-		7.003	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Crane, IN	0.000	0.000		0.050	Feb 2018	0.052	Nov 2018	-		0.052	Continuing	Continuing	Continuing
Systems Engineering	WR	NRL : Washington, DC	0.000	0.000		0.250	Feb 2018	0.255	Nov 2018	-		0.255	Continuing	Continuing	Continuing
		Subtotal	0.000	14.291		25.425		12.777		-		12.777	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support - Jammer Techniques Development	SS/CPFF	Johns Hopkins University : Maryland	0.000	0.000		0.500	Feb 2018	0.511	Dec 2018	-		0.511	0.000	1.011	1.011
Development Support	Various	Various : Various	0.000	0.000		0.617	Feb 2018	0.634	Nov 2018	-		0.634	Continuing	Continuing	Continuing
Eng & Tech Services	Various	Various : Various	0.000	0.374	Nov 2016	0.330	Feb 2018	0.337	Nov 2018	-		0.337	Continuing	Continuing	Continuing
		Subtotal	0.000	0.374		1.447		1.482		-		1.482	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Intrepid Tiger BLK X Flight Testing	WR	NAWCAD : Patuxent River, MD	0.000	0.612	Jan 2017	0.000		0.159	Nov 2018	-		0.159	Continuing	Continuing	Continuing
Intrepid Tiger BLK X Flight Testing	WR	NAWCWD : China Lake, CA	0.000	0.000		1.235	Feb 2018	3.040	Nov 2018	-		3.040	Continuing	Continuing	Continuing
Intrepid Tiger BLK X Flight Testing	WR	NAWCWD : Point Mugu, CA	0.000	0.000		1.500	Dec 2017	1.068	Nov 2018	-		1.068	Continuing	Continuing	Continuing
Intrepid Tiger BLK X Testing	WR	NAWCWD : Point Mugu, CA	0.000	0.803	Jan 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	1.415		2.735		4.267		-		4.267	Continuing	Continuing	N/A

Remarks

Growth in Test & Evaluation between FY 2018 and FY 2019 is due to continued AN/ALQ-231(V)1 BLK X DT and beginning OT.

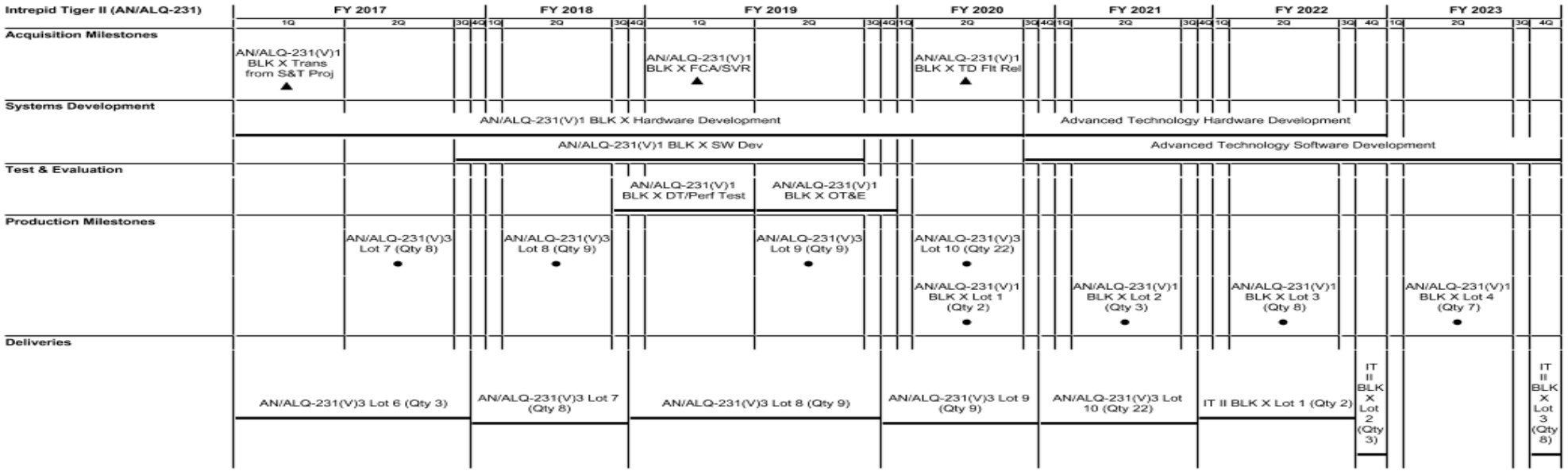
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	Various : Various	0.000	0.035	Oct 2016	0.036	Feb 2018	0.036	Oct 2018	-		0.036	Continuing	Continuing	Continuing
		Subtotal	0.000	0.035		0.036		0.036		-		0.036	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	16.115		29.643		18.562		-		18.562	Continuing	Continuing	N/A

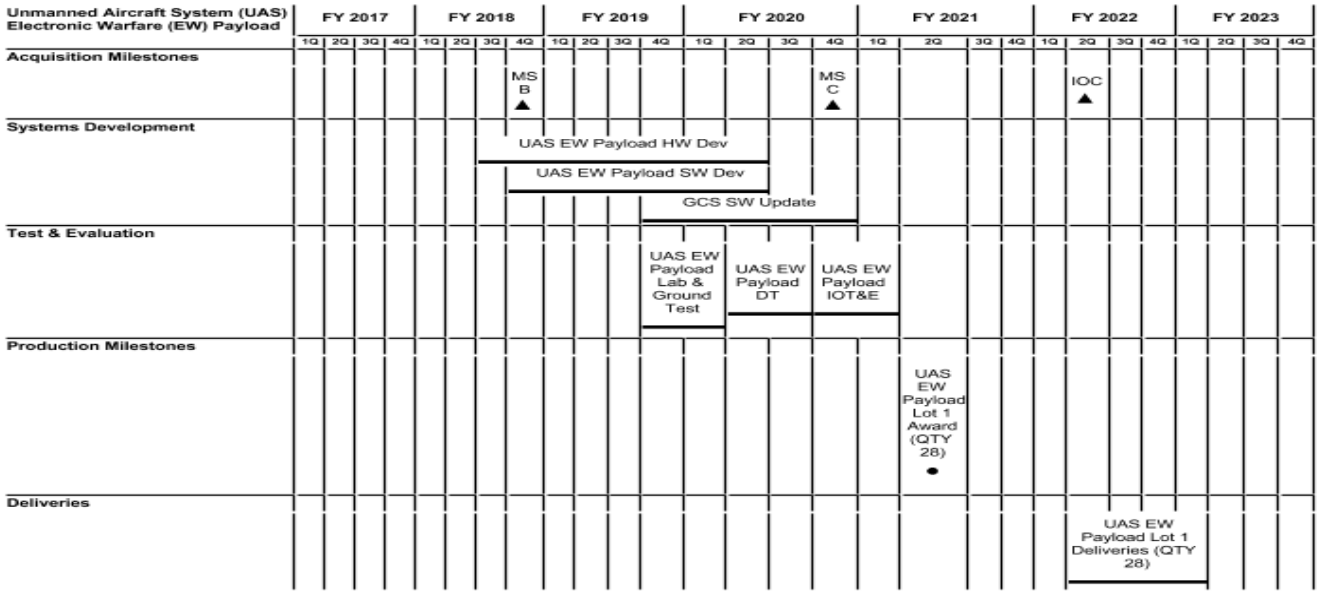
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*



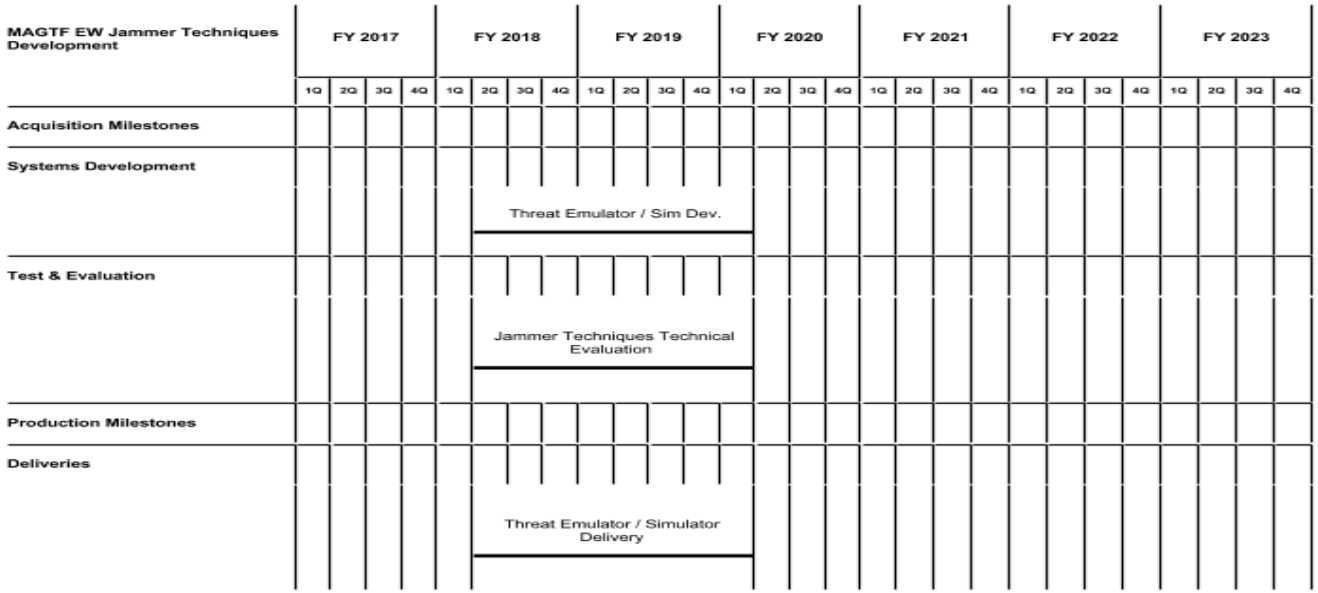
2019PB - 0604270N - 3327 AN/ALQ-231(V)1 BLK X abbreviated to IT II BLK X due to space constraints

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*



2019PB - 0604270N - 3327

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*



2019PB - 0604270N - 3327

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Intrepid Tiger II (AN/ALQ-231)				
Acquisition Milestones: AN/ALQ-231(V)1 BLK X Transition from S&T project	1	2017	1	2017
Acquisition Milestones: AN/ALQ-231(V)1 BLK X Functional Configuration Audit / System Verification Review	1	2019	1	2019
Acquisition Milestones: AN/ALQ-231(V)1 BLK X TD Fleet Release	2	2020	2	2020
Systems Development: AN/ALQ-231(V)1 BLK X Hardware Development	1	2017	2	2020
Systems Development: Advanced Technology Hardware Development	3	2020	4	2022
Systems Development: AN/ALQ-231(V)1 BLK X Software Development	3	2017	2	2019
Systems Development: Advanced Technology Software Development	3	2020	4	2023
Test & Evaluation: AN/ALQ-231(V)1 BLK X Developmental/Performance Test	3	2018	1	2019
Test & Evaluation: AN/ALQ-231(V)1 BLK X OT&E	2	2019	4	2019
Production Milestones: AN/ALQ-231(V)3 Production Lot 7 (Qty 8)	2	2017	2	2017
Production Milestones: AN/ALQ-231(V)3 Production Lot 8 (Qty 9)	2	2018	2	2018
Production Milestones: AN/ALQ-231(V)3 Production Lot 9 (Qty 9)	2	2019	2	2019
Production Milestones: AN/ALQ-231(V)3 Production Lot 10 (Qty 22)	2	2020	2	2020
Production Milestones: AN/ALQ-231(V)1 BLK X Production Lot 1 (2 units)	2	2020	2	2020
Production Milestones: AN/ALQ-231(V)1 BLK X Production Lot 2 (3 units)	2	2021	2	2021
Production Milestones: AN/ALQ-231(V)1 BLK X Production Lot 3 (8 units)	2	2022	2	2022
Production Milestones: AN/ALQ-231(V)1 BLK X Production Lot 4 (7 units)	2	2023	2	2023
Deliveries: AN/ALQ-231(V)3 Lot 6 Deliveries (Qty 3)	1	2017	3	2017
Deliveries: AN/ALQ-231(V)3 Lot 7 Deliveries (Qty 8)	4	2017	3	2018
Deliveries: AN/ALQ-231(V)3 Lot 8 Deliveries (Qty 9)	4	2018	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3327 / *MAGTF EW Aviation Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: AN/ALQ-231(V)3 Lot 9 Deliveries (Qty 9)	4	2019	3	2020
Deliveries: AN/ALQ-231(V)3 Lot 10 Deliveries (Qty 22)	4	2020	3	2021
Deliveries: AN/ALQ-231(V)1 BLK X Lot 1 Deliveries (Qty 2)	4	2021	3	2022
Deliveries: AN/ALQ-231(V)1 BLK X Lot 2 Deliveries (Qty 3)	4	2022	4	2022
Deliveries: AN/ALQ-231(V)1 BLK X Lot 3 Deliveries (Qty 8)	4	2023	4	2023
Unmanned Aircraft System (UAS) Electronic Warfare (EW) Payload				
Acquisition Milestones: UAS EW Payload MS B	4	2018	4	2018
Acquisition Milestones: UAS EW Payload MS C	4	2020	4	2020
Acquisition Milestones: UAS EW Payload IOC	2	2022	2	2022
Systems Development: UAS EW Payload Hardware Development	3	2018	2	2020
Systems Development: UAS EW Payload Software Development	4	2018	2	2020
Systems Development: Ground Control Station Software Update	4	2019	4	2020
Test & Evaluation: UAS EW Payload Lab & Ground Test	4	2019	1	2020
Test & Evaluation: UAS EW Payload Development Test	2	2020	3	2020
Test & Evaluation: UAS EW Payload IOT&E	4	2020	1	2021
Production Milestones: UAS EW Payload Lot 1 Award (QTY 28)	2	2021	2	2021
Deliveries: UAS EW Payload Lot 1 Deliveries (QTY 28)	2	2022	1	2023
MAGTF EW Jammer Techniques Development				
Systems Development: Threat Emulator / Simulator Development	2	2018	1	2020
Test & Evaluation: Jammer Techniques Technical Evaluation	2	2018	1	2020
Deliveries: Threat Emulator / Simulator Delivery	2	2018	1	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604270N / *Electronic Warfare (EW) Dev*	Project (Number/Name) 3371 / *MAGTF EW Interoperability Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3371: *MAGTF EW Interoperability Development*	0.000	1.617	1.639	0.371	-	0.371	1.281	1.199	1.002	1.029	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

PU 3371 was created in FY 2015 to administratively highlight specific work that was being done in Program Element (PE) 0604376M, Project Unit (PU) 3327. This PU has been moved to PE 0604270N in FY 2017 and continues efforts previously funded under PU 3327.

A. Mission Description and Budget Item Justification

This project unit supports the United States Marine Corps air-ground interoperability by providing a variety of capabilities through multiple functions of the Software Reprogrammable Payload (SRP) when installed aboard SRP-capable aircraft. The spiral development plans allow adaptable, scalable, and open architecture philosophy to reduce stove-pipe solutions but enable future growth at a reduced operational and sustainment cost.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Software Reprogrammable Payload	1.617	1.639	0.371	0.000	0.371
Articles:	-	-	-	-	-
FY 2018 Plans: Continue the development of the reduced form factor SRP for the identified platforms that cannot support the Spiral 2 form factor and field evaluation of the Spiral 2.					
FY 2019 Base Plans: Continue the development of the reduced form factor SRP for the identified platforms that cannot support the Spiral 2 form factor and field evaluation of the Spiral 2.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The FY 2019 funding request was reduced by $1.268 million to account for the availability of prior year execution balances.					
Accomplishments/Planned Programs Subtotals	1.617	1.639	0.371	0.000	0.371

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3371 / *MAGTF EW Interoperability Development*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This project unit is part of United States Marine Corps led efforts to ensure Marine Corps requirements are included in the budget process for the Future Year Defense Program and beyond. This effort is for the Software Reprogrammable Payload. This program is part of the Marine Corps initial steps to create a common interoperable system to distribute multiple data types across the battle-space through spiral development.

E. Performance Metrics

Successful completion of the Spiral 2 development and demonstration onboard MV-22 test platform.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3371 / *MAGTF EW Interoperability Development*

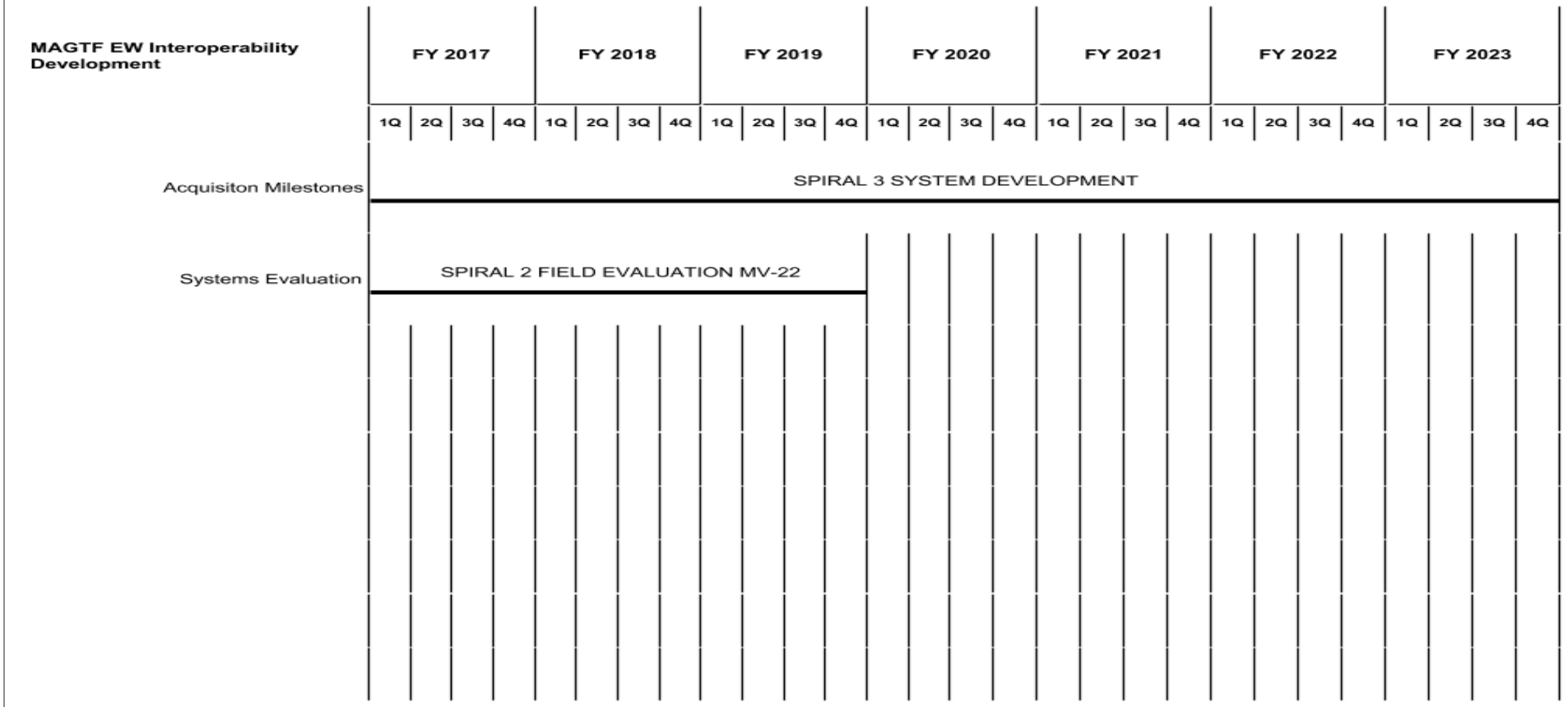
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.408	Nov 2016	0.706	Nov 2017	0.371	Nov 2018	-		0.371	Continuing	Continuing	Continuing
Systems Engineering	WR	NRL : Washington, DC	0.000	0.344	Nov 2016	0.165	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	Assurance Technology Corp : Carlisle, MA	0.000	0.665	Dec 2016	0.519	Dec 2017	0.000		-		0.000	0.000	1.184	1.184
Systems Engineering	C/CPFF	DCS : Alexandria, VA	0.000	0.200	Dec 2016	0.249	Dec 2017	0.000		-		0.000	0.000	0.449	0.449
		Subtotal	0.000	1.617		1.639		0.371		-		0.371	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.617		1.639		0.371		-		0.371	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3371 / *MAGTF EW Interoperability Development*



2019PB - 0604270N - 3371

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604270N / *Electronic Warfare (EW) Dev*	**Project (Number/Name)** 3371 / *MAGTF EW Interoperability Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MAGTF EW Interoperability Development				
Acquisiton Milestones: SPIRAL 3 SYSTEM DEVELOPMENT	1	2017	4	2023
Systems Evaluation: SPIRAL 2 FIELD EVALUATION MV-22	1	2017	4	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604273M *I (U)Executive Helo Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	0.000	245.064	-	245.064	187.670	83.881	39.100	24.874	Continuing	Continuing
3300: *Presidential Helicopter VH-92A*	0.000	0.000	0.000	245.064	-	245.064	165.219	59.924	14.719	0.000	0.000	484.926
3390: *VH-92A Improvements*	0.000	0.000	0.000	0.000	-	0.000	22.451	23.957	24.381	24.874	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 429												

Note

Funds increase from FY 2018 to FY 2019 due to transfer of effort from PE 0604273N beginning in FY 2019.

A. Mission Description and Budget Item Justification

The VH-92A is the replacement helicopter for the VH-3D and the VH-60N, the aircraft currently used by Marine Helicopter Squadron One (HMX-1) to transport the President, Vice President, and other distinguished officials as directed by the White House Military Office. The VH-3D and VH-60N are approaching the end of their service lives. Funding for the VH-92A program supports Engineering and Manufacturing Development Phase activities, including: integration of systems; production, qualification, and support of test articles; development of logistics products; and demonstration of system integration, interoperability, safety, and utility.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	245.064	-	245.064
Total Adjustments	0.000	0.000	245.064	-	245.064
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	247.090	-	247.090
• Rate/Misc Adjustments	0.000	0.000	-2.026	-	-2.026

Change Summary Explanation

Funds increase from FY 2018 to FY 2019 due to transfer of effort from PE 0604273N beginning in FY 2019.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604273M *I (U)Executive Helo Development*

Technical: Not applicable.

Schedule:
1. The program is planning to meet the Full Rate Production (FRP) entrance criteria earlier than originally stated in the Acquisition Program Baseline (3Q FY2021), therefore the FRP milestone has moved from 3Q FY2021 to 1Q FY2021.
2. The Contractor Logistics Support completion and commencement of Interim Contractor Support has moved from 2Q FY 2021 to 1Q FY 2021 to align with the completion of the EMD contract.
3. To better align with Milestone C and contract delivery dates, Low Rate Initial Production (LRIP) Lot 1 contract award moved from 3Q FY 2019 to 2Q FY 2019 and LRIP Lot 1 delivery schedule moved from 2Q FY 2021 to 3Q FY 2021.
4. Engineering Development Model (EDM) 2 aircraft delivery shifted from 4Q FY 2018 to 1Q FY 2019 and commencement of SDTA deliveries shifted from 1Q FY 2019 to 2Q FY 2019 to align with contract delivery dates.
5. Initial Operational Test and Evaluation (IOT&E) commencement shifted right two months within 1Q FY 2020 from October to December due to align with SDTA aircraft deliveries.
6. LFT&E Report shifted from 4Q FY 2020 to 1Q FY 2021 commensurate with completion of LFT&E in 4Q FY 2018.
7. IOT&E Report completion shifted from 3Q FY 2020 to 4Q FY 2020 to align with the revised completion timeframe of IOT&E.

Systems Engineering: Not applicable.

Logistics: Not applicable.

Contracting: Not applicable.

Deliveries:
One (1) Engineering Development Model (EDM) aircraft
Four (4) System Demonstration Test Articles (SDTA) aircraft
Twelve (12) Low Rate Initial Production (LRIP) aircraft
Five (5) Full Rate Production (FRP) aircraft

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604273M / *(U)Executive Helo Development*	Project (Number/Name) 3300 / *Presidential Helicopter VH-92A*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3300: *Presidential Helicopter VH-92A*	0.000	0.000	0.000	245.064	-	245.064	165.219	59.924	14.719	0.000	0.000	484.926
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 429

Note

Funds increase from FY 2018 to FY 2019 due to transfer of effort from PE 0604273N beginning in FY 2019. For Program Elements 0604273M and 0604273N combined, the total Project Unit 3300 VH-92A Presidential Helicopter Program RDTEN Total Cost is $2,406.2 million.

A. Mission Description and Budget Item Justification

Marine Helicopter Squadron One (HMX-1) is required to provide safe and timely transportation for the President and Vice President of the United States, heads of state and others as directed by the White House Military Office. Currently two Type, Model, Series aircraft are used by HMX-1 for the Presidential support mission - the VH-3D and the VH-60N. The VH-92A will replace the VH-3D and VH-60N. Funding supports Engineering and Manufacturing Development Phase (EMD) activities including integration of systems, production, qualification, and support of test articles, logistics products development, demonstration of system integration, interoperability, safety and utility. Two Engineering Development Model (EDM) and four System Demonstration Test Article (SDTA) aircraft will be delivered during EMD. The EDM and SDTA aircraft will be used for Developmental Test & Evaluation for verification of Performance Based Specifications (PBS), airworthiness certification and Supportability Verification. The SDTA aircraft will be used for Initial Operational Test and Evaluation (IOT&E) and will be refurbished for Initial Operational Capability (IOC).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	0.000	0.000	197.599	0.000	197.599
Articles:	-	-	-	-	-
FY 2018 Plans: FY 2018 Product Development efforts are funded in PE 0604273N.					
FY 2019 Base Plans: Continue engineering support for MCS and hardware/software maturation. Deliver completed second EDM and first two SDTA aircraft and continue modification of remaining two SDTA aircraft to the VH-92A configuration. Continue Contractor Logistics Support (CLS) at NAWCAD Patuxent River to support government led Integrated Test. Continue providing GFE to prime contractor. Execute EMD Phase activities, including: integration of systems; production, qualification, and support of test articles; development of logistics products; and					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273M / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
demonstration of system integration, interoperability, safety, and utility. Conduct Milestone C and award LRIP contract. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Project Unit 3300 was previously funded under PE0604273N, causing the appearance of an increase from FY 2018 to FY 2019. Funding actually decreases from $394.903 million in FY 2018 to $197.599 million in FY 2019 as the modifications of the EDM and SDTA aircraft ramp down.					
Title: Support ***Articles:*** ***FY 2018 Plans:*** FY 2018 Support efforts are funded in PE 0604273N. ***FY 2019 Base Plans:*** Continue support of ALE product standup in order to support Integrated Test in FY 2019. Continue preparation of Milestone C supportability products. Continue to support procurement and delivery of CSE. Continue procurement of support equipment products. Perform Support Equipment (SE) evaluations. Continue the development and generation of task analyses and maintenance summaries. Continue Level of Repair Analyses and implementation of I-level test and check capability and repair capability. Continue all IETM development/ verification. Perform supportability test and evaluation, to include maintenance demonstrations. Support programmatic and technical reviews. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Project Unit 3300 was previously funded under PE 0604273N, causing the appearance of an increase from FY 2018 to FY 2019. Funding actually decreases from $28.540 million in FY 2018 to $20.364 million in FY 2019 due to EMD efforts beginning to ramp down.	0.000 -	0.000 -	20.364 -	0.000 -	20.364 -
Title: Test and Evaluation ***Articles:*** ***FY 2018 Plans:***	0.000 -	0.000 -	19.620 -	0.000 -	19.620 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273M / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Test and Evaluation efforts are funded in PE 0604273N. ***FY 2019 Base Plans:*** Continue Government Integrated testing, cyber-testing and evaluation, PBS compliance verification, support equipment evaluations/assessments, instrumentation development/support and Integrated Test support at the Presidential Helicopter Support Facility. Produce test reports (Integrated Test, Operational Test, LFT&E) to support IOT&E. Conduct operational assessment and training of Operational Test Team personnel in preparation for IOT&E. Continue to mature SIL and conduct software/hardware regression testing and validation/ verification. Initiate planning for Follow-On Test and Evaluation (FOT&E) to include shipboard compatibility testing and evaluation of continued development of the VH-92A System. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Project Unit 3300 was previously funded under PE 0604273N, causing the appearance of an increase from FY 2018 to FY 2019. Funding decreases from $21.139 million in FY 2018 to $19.620 million in FY 2019 due to EMD efforts beginning to ramp down.					
Title: Program Management	0.000	0.000	7.481	0.000	7.481
Articles:	-	-	-	-	-
FY 2018 Plans: FY 2018 Program Management efforts are funded in PE 0604273N. ***FY 2019 Base Plans:*** Perform project management tasks to support Milestone C preparation, technical reviews, risk-reduction activities, contractor deliverables, configuration management, training, physical security, and information assurance/cyber security. Perform planned SRA and EAC update. Conduct Milestone C and award LRIP contract. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273M / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Project Unit 3300 was previously funded under PE 0604273N. There is a slight increase from $7.356 million in FY 2018 to $7.481 million in FY 2019, which is due to inflation.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	245.064	0.000	245.064

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN-4/04550: *VH-92A Executive Helo*	0.000	0.000	649.015	-	649.015	658.273	713.178	0.000	0.000	0.000	2,020.466
• RDTEN/0604273N: *Executive Helo Development*	327.770	451.938	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,921.289
• APN-6/0605: *Spares and Repair Parts*	0.000	0.000	80.939	-	80.939	87.983	73.907	0.000	0.000	0.000	242.829

Remarks

D. Acquisition Strategy

The VH-92A program is integrating mature subsystems into an existing commercial helicopter under a Fixed Price Incentive Firm (FPIF) contract. The program is procuring two (2) Engineering Development Model aircraft, four (4) System Demonstration Test Article aircraft, twelve (12) Low Rate Initial Production aircraft and five (5) Full Rate Production aircraft.

E. Performance Metrics

Program performance metrics are contained in the Acquisition Program Baseline (APB) that was approved by the Milestone Decision Authority (USD(AT&L)) on 17 Apr 2014. The program's Milestone (MS) B Acquisition Decision Memorandum was signed on 17 Apr 2014. The VH-92A contract for the Engineering and Manufacturing Development phase and priced options for production was awarded on 7 May 2014. The VH-92A Program successfully completed the System Preliminary Design Review on 21 August 2015. The program conducted the Critical Design Review (CDR) in FY 2016. The program plans to conduct the Test Readiness Review, the Flight Readiness Review, and the Production Readiness Review in FY 2018. Milestone C approval is anticipated 2Q FY 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273M / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Dev - VH-92A EMD Contract	C/FPIF	Sikorsky Aircraft Corporation : Stratford, CT	0.000	0.000		0.000		139.681	Oct 2018	-		139.681	110.497	250.178	250.178
Primary HW Dev - Advanced Capabilities	Various	NSMA : Arlington, VA	0.000	0.000		0.000		26.758	Feb 2019	-		26.758	33.157	59.915	-
Primary HW Dev - VH-92A MCS Design	WR	NAWCAD : St. Inigoes, MD	0.000	0.000		0.000		5.555	Nov 2018	-		5.555	9.383	14.938	-
Primary HW Dev - VH-92A GFE	Various	Various : Various	0.000	0.000		0.000		9.170	Nov 2018	-		9.170	0.000	9.170	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		13.918	Nov 2018	-		13.918	21.215	35.133	-
Training	WR	NAWCTSD : Orlando, FL	0.000	0.000		0.000		2.517	Nov 2018	-		2.517	5.560	8.077	-
Prior year Hdw Dev cost no longer funded in the FYDP	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		197.599		-		197.599	179.812	377.411	N/A

Remarks

FUNDING PROFILE: The Target Value of the Primary Hardware Development EMD contract has been updated to include the contract CLINS for the Firm Fixed Price Test Spares and the Delivery Incentives. This Target Value reflects the total value of the EMD contract for PE 0604273M. The total value of the EMD contract is $1,560.633 million to include $1,310.455 million funded by PE 0604273N.
FINANCIAL PERFORMANCE: The VH-92A EMD is a Fixed Price Incentive contract with Performance Based Payments. The VH-92A program will lag OSD traditional expenditure benchmarks. The program must obligate 100 percent of the funding required by the contractor for incurred costs, termination liability, and profit. However, the program is limited to paying the contractor only 90 percent of the performance based costs and profit. Mandatory funding obligations and payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program health.

ACRONYMS:
EMD = Engineering & Manufacturing Development
MCS = Mission Communications System
GFE = Government Furnished Equipment

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273M / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		7.873	Nov 2018	-		7.873	11.334	19.207	-
Integrated Logistics Support	WR	FRC : Cherry Point, NC	0.000	0.000		0.000		8.284	Nov 2018	-		8.284	8.814	17.098	-
Integrated Logistics Support	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		1.505	Nov 2018	-		1.505	1.772	3.277	-
Integrated Logistics Support	WR	SPAWAR : San Diego, CA	0.000	0.000		0.000		0.698	Nov 2018	-		0.698	0.504	1.202	-
Integrated Logistics Support	Various	NAVAIR : Patuxent River, MD	0.000	0.000		0.000		2.004	Sep 2019	-		2.004	1.935	3.939	-
Prior year support cost no longer funded in the FYDP	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		20.364		-		20.364	24.359	44.723	N/A

Remarks

FUNDING PROFILE:
Integrated Logistics Support (NAWCAD Patuxent River) - ILS acquisition and management of the VH-92A aircraft. Evaluate contractor development of ILS efforts, Supportability Test & Evaluation, Intermediate & Depot level repair capability development.
Integrated Logistics Support (FRC Cherry Point) - VH-92A maintenance planning, reliability centered maintenance (RCM), logistics support analysis efforts, level of repair analysis and IETMS development.
Integrated Logistics Support (NAWCAD Lakehurst) - SE planning and analysis to include procurement of CSE, development of support equipment requirements data (SERDs) and logistics support products for SE and SE test and evaluation. Funds previously planned in the Integrated Logistics Support- CSE line in President's Budget FY 2018 has been moved to this line due to updated procurement strategies.
Integrated Logistics Support (SPAWAR San Diego) - Architecture development and software integration to include certification and accreditation of the VH-92A ALE.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		12.300	Nov 2018	-		12.300	20.283	32.583	-
Development Test & Evaluation	WR	NAWCWD : Point Mugu, CA	0.000	0.000		0.000		0.014	Nov 2018	-		0.014	0.042	0.056	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604273M / *(U)Executive Helo Development*	Project (Number/Name) 3300 / *Presidential Helicopter VH-92A*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	MIPR	JITC : Ft. Huachuca, AZ	0.000	0.000		0.000		0.048	Oct 2018	-		0.048	0.043	0.091	-
Live Fire Test & Evaluation	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		2.115	Nov 2018	-		2.115	1.724	3.839	-
Operational Test & Evaluation	WR	COTF : Norfolk, VA	0.000	0.000		0.000		1.143	May 2019	-		1.143	1.093	2.236	-
Integrated Test & Evaluation	C/FFP	TBD : Patuxent River, MD	0.000	0.000		0.000		4.000	Oct 2018	-		4.000	0.000	4.000	4.000
		Subtotal	0.000	0.000		0.000		19.620		-		19.620	23.185	42.805	N/A

Remarks

Development Test & Evaluation (NAWCAD Patuxent River) - Support for developmental test & evaluation, contractor test (CT), government led Integrated Test, Operational Assessment (OA), system integration lab, T&E instrumentation design, procurement, calibration, and tooling.
Development Test & Evaluation (NAWCWD Point Mugu) - Cyber Security T&E.
Development Test & Evaluation (JITC) - Joint Interoperability Test Certification.
Live Fire Test & Evaluation (NAWCWD China Lake) - LFT&E test planning/documentation and conduct of LFT&E test events.
Operational Test & Evaluation (COTF) - Technical and engineering support in support of Operational Test and Integrated Test and evaluation of the VH-92A aircraft. Support efforts include documentation review, test planning, operational test design, test analysis and reporting and test operations.
Integrated Test & Evaluation (TBD: Patuxent River) - Lease of a training asset in support of test pilot proficiency training.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		4.962	Nov 2018	-		4.962	8.208	13.170	-
Program Management Support	Various	NAVAIR : Patuxent River, MD	0.000	0.000		0.000		2.312	Dec 2018	-		2.312	3.916	6.228	-
Transportation	Various	NAVAIR : Patuxent River, MD	0.000	0.000		0.000		0.050	Oct 2018	-		0.050	0.075	0.125	-
Travel	Various	NAVAIR : Patuxent River, MD	0.000	0.000		0.000		0.157	Oct 2018	-		0.157	0.307	0.464	-
		Subtotal	0.000	0.000		0.000		7.481		-		7.481	12.506	19.987	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604273M / *(U)Executive Helo Development*	Project (Number/Name) 3300 / *Presidential Helicopter VH-92A*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		245.064		-		245.064	239.862	484.926	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273M / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

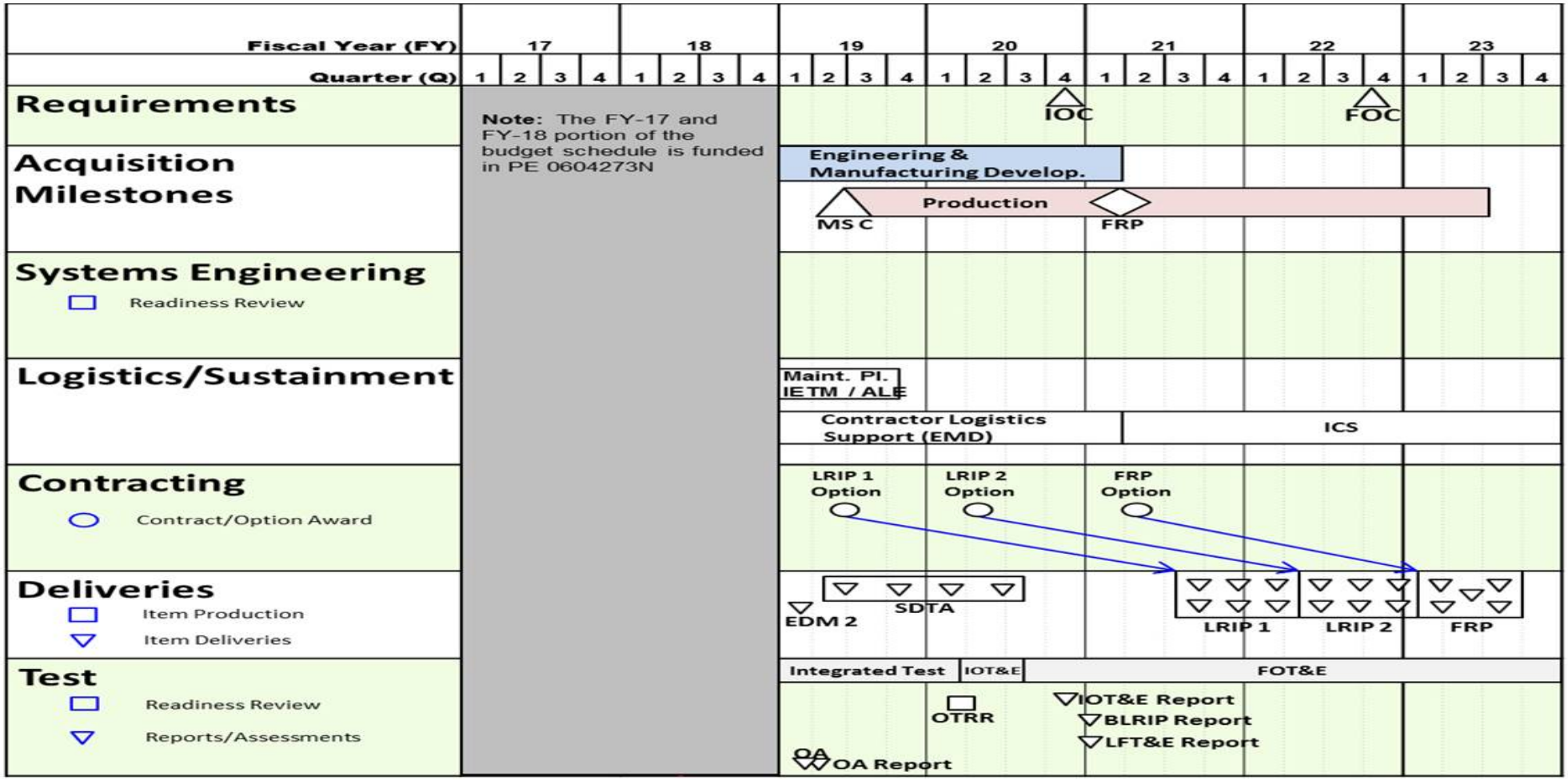


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273M / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Presidential Helicopter VH-92A				
Requirements: Initial Operational Capability	4	2020	4	2020
Requirements: Full Operational Capability	4	2022	4	2022
Acquisition Milestones: Engineering & Manufacturing Development	1	2019	1	2021
Acquisition Milestones: Production	2	2019	3	2023
Acquisition Milestones: MS C	2	2019	2	2019
Acquisition Milestones: Full Rate Production Decision	1	2021	1	2021
Logistics/Sustainment: Maintenance Planning / IETM / ALE	1	2019	4	2019
Logistics/Sustainment: Contractor Logistics Support (EMD)	1	2019	1	2021
Logistics/Sustainment: Interim Contractor Support	1	2021	4	2023
Contracting: LRIP Lot 1 APN	2	2019	2	2019
Contracting: LRIP Lot 2 APN	2	2020	2	2020
Contracting: FRP APN	2	2021	2	2021
Deliveries: EDM 2	1	2019	1	2019
Deliveries: System Demonstration Test Article (SDTA) Aircraft 1	2	2019	2	2019
Deliveries: System Demonstration Test Article (SDTA) Aircraft 2	4	2019	4	2019
Deliveries: System Demonstration Test Article (SDTA) Aircraft 3	1	2020	1	2020
Deliveries: System Demonstration Test Article (SDTA) Aircraft 4	2	2020	2	2020
Deliveries: Low Rate Initial Production - Lot 1 (APN)	3	2021	2	2022
Deliveries: Low Rate Initial Production - Lot 2 (APN)	2	2022	1	2023
Deliveries: Full Rate Production (APN)	1	2023	3	2023
Test: Developmental Test - Integrated Test	1	2019	1	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273M / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test: Live Fire Test & Evaluation Report	1	2021	1	2021
Test: Operational Assessment	1	2019	1	2019
Test: Operational Assessment Report	2	2019	2	2019
Test: Operational Test Readiness Review	1	2020	1	2020
Test: Initial Operational Test & Evaluation	1	2020	3	2020
Test: Initial Operational Test & Evaluation Report	4	2020	4	2020
Test: Follow-on Test & Evaluation	3	2020	4	2023
Test: Beyond Low Rate Initial Production Report	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604273M / *(U)Executive Helo Development*	Project (Number/Name) 3390 / *VH-92A Improvements*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3390: *VH-92A Improvements*	0.000	0.000	0.000	0.000	-	0.000	22.451	23.957	24.381	24.874	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

VH-92A Product Improvement addresses pre-planned product improvement requirements written into the VXX Capabilities Development Document approved by Joint Requirements Oversight Committee in Jan 2013. The VH-92A Improvement project provides near and long term improvements to the fleet, focusing on documented deficiencies related to mission systems, maintainability and reliability and obsolescence issues. The project addresses development associated with Mission Communications System upgrades (both software and hardware), enhancements to Wideband Line of Sight, enhanced visual system, and cockpit upgrades.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604273N *I (U)Executive Helo Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,141.581	327.770	451.938	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,921.289
3300: *Presidential Helicopter VH-92A*	1,141.581	327.770	451.938	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,921.289

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 429

Note

Funds decrease from FY 2018 to FY 2019 due to transfer of effort to new PE 0604273M beginning in FY 2019.

A. Mission Description and Budget Item Justification

The VH-92A is the replacement helicopter for the VH-3D and the VH-60N, the aircraft currently used by Marine Helicopter Squadron One (HMX-1) to transport the President, Vice President, and other distinguished officials as directed by the White House Military Office. The VH-3D and VH-60N are approaching the end of their service lives. Funding for the VH-92A program supports Engineering and Manufacturing Development Phase activities, including: integration of systems; production, qualification, and support of test articles; development of logistics products; and demonstration of system integration, interoperability, safety, and utility.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	338.357	451.938	248.962	-	248.962
Current President's Budget	327.770	451.938	0.000	-	0.000
Total Adjustments	-10.587	0.000	-248.962	-	-248.962
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.232	0.000			
• SBIR/STTR Transfer	-10.344	0.000			
• Program Adjustments	0.000	0.000	-247.090	-	-247.090
• Rate/Misc Adjustments	-0.001	0.000	-1.872	-	-1.872
• Congressional General Reductions Adjustments	-0.010	-	-	-	-

Change Summary Explanation

Funds decrease from FY 2018 to FY 2019 due to transfer of effort to new PE 0604273M beginning in FY 2019.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604273N *I (U)Executive Helo Development*

Technical: Not applicable.

Schedule:
1. Live Fire Test and Evaluation completion shifted from 2Q FY 2018 to 4Q FY 2018 due to reschedule of fuel bladder drop test, certifications, and test fixture availability.

Systems Engineering: Not applicable.

Logistics: Not applicable.

Contracting: Not applicable.

Deliveries:
One (1) Engineering Development Model (EDM) aircraft

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604273N / *(U)Executive Helo Development*	Project (Number/Name) 3300 / *Presidential Helicopter VH-92A*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3300: *Presidential Helicopter VH-92A*	1,141.581	327.770	451.938	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,921.289
Quantity of RDT&E Articles	4	2	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 429

Note

Funding for Project Unit 3300 for FY 2019 through Cost to Complete has been realigned to Program Element 0604273M. For Program Elements 0604273N and 0604273M combined, the total Project Unit 3300 VH-92A Presidential Helicopter Program RDTE,N cost is $2,406.715 million.

A. Mission Description and Budget Item Justification

Marine Helicopter Squadron One (HMX-1) is required to provide safe and timely transportation for the President and Vice President of the United States, heads of state and others as directed by the White House Military Office. Currently two Type, Model, Series aircraft are used by HMX-1 for the Presidential support mission - the VH-3D and the VH-60N. The VH-92A will replace the VH-3D and VH-60N. Funding supports Engineering and Manufacturing Development Phase (EMD) activities including integration of systems, production, qualification, and support of test articles, logistics products development, demonstration of system integration, interoperability, safety and utility. Two Engineering Development Model (EDM) and four System Demonstration Test Article (SDTA) aircraft will be delivered during EMD. The EDM and SDTA aircraft will be used for Developmental Test & Evaluation for verification of Performance Based Specifications (PBS), airworthiness certification and Supportability Verification. The SDTA aircraft will be used for Initial Operational Test and Evaluation (IOT&E) and will be refurbished for Initial Operational Capability (IOC).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	284.136	394.903	0.000	0.000	0.000
Articles:	2	-	-	-	-
FY 2018 Plans: Continue CT for FAA airworthiness certification. Conduct Production Readiness Review (PRR). Continue engineering support for MCS and hardware/software maturation. Finalize modification and delivery of the first EDM aircraft. Continue modification of the second EDM and SDTA aircraft to the VH-92A configuration. Commence government led Integrated Test. Complete Ready-for-Training (RFT) to include the Maintenance Training Device (MTD), Flight Training Device (FTD), Systems Emulation Maintenance Trainer (SEMT) and courseware. Commence Contractor Logistics Support (CLS) at NAWCAD Patuxent River to support government led Integrated Test. Continue providing GFE to prime contractor. Execute EMD Phase activities, including:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
integration of systems; production, qualification, and support of test articles; development of logistics products; and demonstration of system integration, interoperability, safety, and utility. ***FY 2019 Base Plans:*** FY 2019 Product Development efforts are funded in PE 0604273M. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding for Project Unit 3300 in FY 2019 has been realigned to PE 0604273M.					
Title: Support ***Articles:*** ***FY 2018 Plans:*** Continue support of ALE product standup in order to support Integrated Test in FY 2018. Support Test Readiness Review (TRR) and Production Readiness Review (PRR). Begin development of Milestone C supportability products. Continue to support development and delivery of CSE. Develop support equipment products. Perform Support Equipment (SE) evaluations. Continue the development and generation of task analyses and maintenance summaries. Conduct Level of Repair Analyses and begin development and procurement of required I-level test and check capability and repair capability. Continue all IETM development/ verification. Perform supportability test and evaluation, to include maintenance demonstrations. Support programmatic and technical reviews. ***FY 2019 Base Plans:*** FY 2019 Support efforts are funded in PE 0604273M. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding for Project Unit 3300 in FY 2019 has been realigned to PE 0604273M.	24.318 -	28.540 -	0.000 -	0.000 -	0.000 -
Title: Test and Evaluation ***Articles:*** ***FY 2018 Plans:***	13.253 -	21.139 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct TRR/FRR events. Continue Performance Based Specification (PBS) compliance verification, support equipment evaluations/assessments, instrumentation development/support and commence Integrated Test at the Presidential Helicopter Support Facility. Continue LFT&E as required. Transition from contractor led to government led Integrated Test. Conduct government led Integrated Test phase to include overall aircraft mission suitability testing, cyber security T&E, certification, and training systems assessments. Conduct Operational Assessment Maturity Review (OAMR) and prepare for Operational Assessment. Produce test reports (Integrated Test and LFT&E) to support Milestone C. Continue to mature SIL and conduct software/ hardware regression testing and validation/verification. ***FY 2019 Base Plans:*** FY 2019 Test and Evaluation efforts are funded in PE 0604273M. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding for Project Unit 3300 in FY 2019 has been realigned to PE 0604273M.					
Title: Program Management	6.063	7.356	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct Production Readiness Review (PRR) and Test Readiness Review (TRR). Perform project management tasks to support Milestone C preparation, technical reviews, risk-reduction activities, contractor deliverables, configuration management, training, physical security, and information assurance/cybersecurity. Perform planned SRA and EAC update. ***FY 2019 Base Plans:*** FY 2019 Program Management efforts are funded in PE 0604273M. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding for Project Unit 3300 in FY 2019 has been realigned to PE 0604273M.					
Accomplishments/Planned Programs Subtotals	327.770	451.938	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN-4/04550: *VH-92A Executive Helo*	0.000	0.000	649.015	-	649.015	658.273	713.178	0.000	0.000	0.000	2,020.466
• APN-6/0605: *Spares and Repair Parts*	0.000	0.000	80.939	-	80.939	87.983	73.907	0.000	0.000	0.000	242.829
• RDTEN/0604273M: *Executive Helo Development*	0.000	0.000	245.064	-	245.064	187.670	83.881	39.100	24.874	Continuing	Continuing

Remarks

D. Acquisition Strategy

The VH-92A program is integrating mature subsystems into an existing commercial helicopter under a Fixed Price Incentive Firm (FPIF) contract. The program is procuring two (2) Engineering Development Model aircraft, four (4) System Demonstration Test Article aircraft, twelve (12) Low Rate Initial Production aircraft and five (5) Full Rate Production aircraft.

E. Performance Metrics

Program performance metrics are contained in the Acquisition Program Baseline (APB) that was approved by the Milestone Decision Authority (USD(AT&L)) on 17 Apr 2014. The program's Milestone (MS) B Acquisition Decision Memorandum was signed on 17 Apr 2014. The VH-92A contract for the Engineering and Manufacturing Development phase and priced options for production was awarded on 7 May 2014. The VH-92A Program successfully completed the System Preliminary Design Review on 21 August 2015. The program conducted the Critical Design Review (CDR) in FY 2016. The program plans to conduct the Test Readiness Review, the Flight Readiness Review, and the Production Readiness Review in FY 2018. Milestone C approval is anticipated 2Q FY 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Dev - VH-92A EMD Contract	C/FPIF	Sikorsky Aircraft Corporation : Stratford, CT	744.928	228.859	Oct 2016	336.668	Oct 2017	0.000		-		0.000	0.000	1,310.455	1,310.455
Primary HW Dev - Advanced Capabilities	Various	NSMA : Arlington, VA	99.537	20.289	Feb 2017	25.422	Feb 2018	0.000		-		0.000	0.000	145.248	-
Primary HW Dev - VH-92A MCS Design	WR	NAWCAD : St. Inigoes, MD	51.081	9.819	Nov 2016	6.064	Nov 2017	0.000		-		0.000	0.000	66.964	-
Primary HW Dev - Wideband Line of Sight	MIPR	US Army : APG, MD	10.110	0.154	Aug 2017	0.000		0.000		-		0.000	0.000	10.264	-
Primary HW Dev - VH-92A GFE	Various	Various : Various	4.707	4.263	Nov 2016	6.885	Nov 2017	0.000		-		0.000	0.000	15.855	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	60.954	17.815	Nov 2016	17.344	Nov 2017	0.000		-		0.000	0.000	96.113	-
Training	WR	NAWCTSD : Orlando, FL	2.790	2.937	Nov 2016	2.520	Nov 2017	0.000		-		0.000	0.000	8.247	-
Prior year Hdw Dev cost no longer funded in the FYDP	Various	Various : Various	14.855	0.000		0.000		0.000		-		0.000	0.000	14.855	-
		Subtotal	988.962	284.136		394.903		0.000		-		0.000	0.000	1,668.001	N/A

Remarks

FUNDING PROFILE: The Target Value of the Primary Hardware Development EMD contract has been updated to include the contract CLINS for the Firm Fixed Price Test Spares and the Delivery Incentives. This Target Value reflects the total value of the EMD contract for PE 0604273N. The total value of the EMD contract is $1,560.633 million to include $250.178 million funded by PE 0604273M.

FINANCIAL PERFORMANCE: The VH-92A EMD is a Fixed Price Incentive contract with Performance Based Payments. The VH-92A program will lag OSD traditional expenditure benchmarks. The program must obligate 100 percent of the funding required by the contractor for incurred costs, termination liability, and profit. However, the program is limited to paying the contractor only 90 percent of the performance based costs and profit. Mandatory funding obligations and payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program health.

ACRONYMS:
EMD = Engineering & Manufacturing Development
MCS = Mission Communications System
GFE = Government Furnished Equipment

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	24.005	10.875	Nov 2016	10.434	Nov 2017	0.000		-		0.000	0.000	45.314	-
Integrated Logistics Support	WR	FRC : Cherry Point, NC	10.333	9.809	Nov 2016	11.659	Nov 2017	0.000		-		0.000	0.000	31.801	-
Integrated Logistics Support	WR	NAWCAD : Lakehurst, NJ	6.182	1.249	Nov 2016	2.392	Nov 2017	0.000		-		0.000	0.000	9.823	-
Integrated Logistics Support	WR	SPAWAR : San Diego, CA	1.599	2.075	Nov 2016	2.084	Nov 2017	0.000		-		0.000	0.000	5.758	-
Integrated Logistics Support	Various	NAVAIR : Patuxent River, MD	0.000	0.310	Aug 2017	1.971	Aug 2018	0.000		-		0.000	0.000	2.281	-
Prior year support cost no longer funded in the FYDP	Various	Various : Various	5.589	0.000		0.000		0.000		-		0.000	0.000	5.589	-
		Subtotal	47.708	24.318		28.540		0.000		-		0.000	0.000	100.566	N/A

Remarks

FUNDING PROFILE: The increase in FY 2018 is for the Automated Logistics Environment (ALE) product standup in support of Integrated Test. FY 2018 funds are required for maintenance planning and reliability centered maintenance planning, Common Support Equipment (CSE) development and delivery, Support Equipment (SE) evaluations, Interactive Electronic Technical Manual (IETM) development/verification, and Level of Repair analysis. The change in Integrated Logistics Support (ILS) at NAVAIR is due to the realignment of support contracts from NAWCAD Patuxent River to NAVAIR Headquarters.

Integrated Logistics Support (NAWCAD Patuxent River) - ILS acquisition and management of the VH-92A aircraft. Evaluate contractor development of ILS efforts, Supportability Test & Evaluation, Intermediate & Depot level repair capability development.
Integrated Logistics Support (FRC Cherry Point) - VH-92A maintenance planning, reliability centered maintenance (RCM), logistics support analysis efforts, level of repair analysis and IETMS development.
Integrated Logistics Support (NAWCAD Lakehurst) - SE planning and analysis to include procurement of CSE, development of support equipment requirements data (SERDs) and logistics support products for SE and SE test and evaluation. Funds previously planned in the Integrated Logistics Support- CSE line in President's Budget FY 2018 has been moved to this line due to updated procurement strategies.
Integrated Logistics Support (SPAWAR San Diego) - Architecture development and software integration to include certification and accreditation of the VH-92A ALE.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NAWCAD : Patuxent River, MD	13.566	7.017	Nov 2016	14.113	Nov 2017	0.000		-		0.000	0.000	34.696	-
Development Test & Evaluation	WR	NAWCWD : Point Mugu, CA	0.094	0.015	Nov 2016	0.014	Nov 2017	0.000		-		0.000	0.000	0.123	-
Development Test & Evaluation	MIPR	JITC : Ft. Huachuca, AZ	0.057	0.020	Oct 2016	0.045	Oct 2017	0.000		-		0.000	0.000	0.122	-
Live Fire Test & Evaluation	WR	NAWCWD : China Lake, CA	7.790	4.982	Nov 2016	1.725	Nov 2017	0.000		-		0.000	0.000	14.497	-
Operational Test & Evaluation	WR	COTF : Norfolk, VA	1.745	1.219	May 2017	1.242	May 2018	0.000		-		0.000	0.000	4.206	-
Integrated Test & Evaluation	C/FFP	TBD : Patuxent River, MD	0.000	0.000		4.000	Feb 2018	0.000		-		0.000	0.000	4.000	4.000
		Subtotal	23.252	13.253		21.139		0.000		-		0.000	0.000	57.644	N/A

Remarks

Development Test & Evaluation (NAWCAD Patuxent River) - Support for developmental test & evaluation, contractor test (CT), government led Integrated Test, Operational Assessment (OA), system integration lab, T&E instrumentation design, procurement, calibration, and tooling.
Development Test & Evaluation (NAWCWD Point Mugu) - Cyber Security T&E.
Development Test & Evaluation (JITC) - Joint Interoperability Test Certification.
Live Fire Test & Evaluation (NAWCWD China Lake) - LFT&E test planning/documentation and conduct of LFT&E test events.
Operational Test & Evaluation (COTF) - Technical and engineering support in support of Operational Test and Integrated Test and evaluation of the VH-92A aircraft. Support efforts include documentation review, test planning, operational test design, test analysis and reporting and test operations.
Integrated Test & Evaluation (TBD: Patuxent River) - Lease of a training asset in support of test pilot proficiency training.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	53.926	5.962	Nov 2016	4.862	Nov 2017	0.000		-		0.000	0.000	64.750	-
Program Management Support	Various	NAVAIR : Patuxent River, MD	0.000	0.000		2.312	Dec 2017	0.000		-		0.000	0.000	2.312	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Transportation	Various	NAVAIR : Patuxent River, MD	0.285	0.025	Oct 2016	0.025	Oct 2017	0.000		-		0.000	0.000	0.335	-
Travel	Various	NAVAIR : Patuxent River, MD	0.349	0.076	Oct 2016	0.157	Oct 2017	0.000		-		0.000	0.000	0.582	-
Prior year Mgmt Svcs cost no longer funded in the FYDP	Various	Various : Various	27.099	0.000		0.000		0.000		-		0.000	0.000	27.099	-
		Subtotal	81.659	6.063		7.356		0.000		-		0.000	0.000	95.078	N/A

Remarks

FUNDING PROFILE: The change in Program Management Support at NAVAIR is due to the realignment of support contracts from NAWCAD Patuxent River to NAVAIR Headquarters.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,141.581	327.770		451.938		0.000		-		0.000	0.000	1,921.289	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

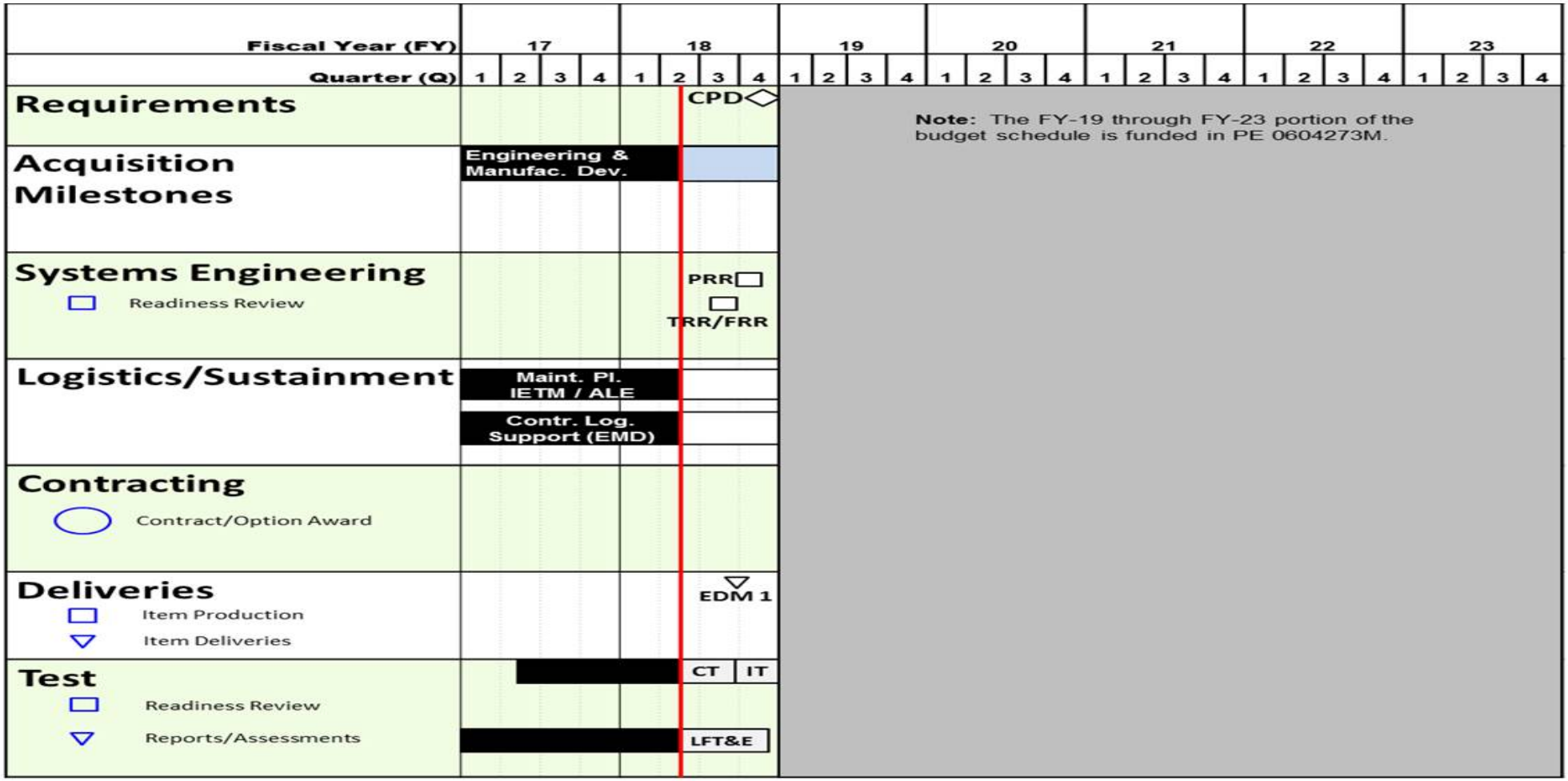


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604273N / *(U)Executive Helo Development*	**Project (Number/Name)** 3300 / *Presidential Helicopter VH-92A*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Presidential Helicopter VH-92A				
Requirements: Capabilities Production Document	4	2018	4	2018
Acquisition Milestones: Engineering & Manufacturing Development	1	2017	4	2018
Systems Engineering: Test Readiness Review/Flight Readiness Review (TRR/FRR)	3	2018	3	2018
Systems Engineering: Production Readiness Review	4	2018	4	2018
Logistics/Sustainment: Maintenance Planning / IETM / ALE	1	2017	4	2018
Logistics/Sustainment: Contractor Logistics Support (EMD)	1	2017	4	2018
Deliveries: EDM 1	3	2018	3	2018
Test: Developmental Test - Contractor Test	2	2017	3	2018
Test: Developmental Test - Integrated Test	3	2018	4	2018
Test: Live Fire Test & Evaluation	1	2017	4	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604274N *I Next Generation Jammer (NGJ)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,255.215	559.017	632.936	459.529	-	459.529	568.662	408.105	160.999	0.000	0.000	4,044.463
0557: *Next Generation Jammer*	1,255.215	559.017	632.936	459.529	-	459.529	568.662	408.105	160.999	0.000	0.000	4,044.463
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** P445												

A. Mission Description and Budget Item Justification

The Next Generation Jammer (NGJ) is the next step in the evolution of Airborne Electronic Attack (AEA) and is a critical capability necessary to address current, emerging, and evolving Electronic Warfare gaps, ensure kill chain wholeness against growing threat capabilities and capacity, keep pace with enemy threat weapon systems' advancements, and support the continuous expansion of the AEA mission areas that exceed the capability of currently fielded systems. NGJ will utilize enhanced techniques and tactics to deliver significantly improved radar and communications jamming effectiveness as well as other classified capabilities. Utilizing an Open Systems Architecture that supports software and hardware updates to rapidly counter emergent and evolving threats, NGJ is a key enabler and force multiplier for operations across the spectrum of missions defined in the Defense Strategic Guidance, including strike warfare, projecting power despite anti-access/area denial challenges, and counterinsurgency/irregular warfare. NGJ will also address the shortfalls in scalability, flexibility, supportability, interoperability, availability, and capability of the existing AN/ALQ-99 Tactical Jamming System.

This Program Element (PE 0604274N) supports the AN/ALQ-249 Next Generation Jammer - Mid Band (NGJ-MB) (formerly known as Next Generation Jammer Increment 1) program. NGJ-MB will address AEA capability and sufficiency gaps against enemy threats operating in the middle frequency bands of the electromagnetic spectrum. NGJ-MB will provide the ability to effectively engage enemy threats from increased stand-off distances, employ increased capacity (number of jamming assignments) against enemy targets, and support agile employment by operators. The NGJ-MB system will be integrated on the EA-18G tactical aircraft and replace the aging AN/ALQ-99 Tactical Jamming System Mid-Band pods.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	577.822	632.936	539.770	-	539.770
Current President's Budget	559.017	632.936	459.529	-	459.529
Total Adjustments	-18.805	0.000	-80.241	-	-80.241
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-18.805	0.000			
• Program Adjustments	0.000	0.000	-74.630	-	-74.630

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy				Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	R-1 Program Element (Number/Name) PE 0604274N *I Next Generation Jammer (NGJ)*			

• Rate/Misc Adjustments	0.000	0.000	-5.611	-	-5.611

Change Summary Explanation

Technical: Not applicable.

Schedule: A system CDR was held 3rd Qtr. FY 2017, which revealed deficiencies in modeling, assumptions, and methodologies used in the design of the pod structure. These deficiencies are driving a redesign of the pod structure, but subsystem design, development, manufacturing, integration, and test are continuing independent of the pod structure redesign effort. The following changes have been made: Milestone C moved from 4th Qtr. FY 2019 to 4th Qtr. FY 2020. Initial Operational Capability moved from 4th Qtr. FY 2021 to 4th Qtr. FY 2022. Full Rate Production Decision Review moved from 1st Qtr. FY 2022 to 1st Qtr. FY 2023. Engineering & Manufacturing Development end moved from 3rd Qtr. FY 2021 to 3rd Qtr. FY 2022. Engineering Development Model Deliveries start moved from 1st Qtr. FY 2019 to 3rd Qtr. FY 2019. Integrated Testing broken out to Aeromechanical Testing (IT-B1), Mission Systems Testing (IT-B2), Mission Systems Testing (IT-C1) for clarity. Operational Test Readiness Review moved from 2nd Qtr. 2021 to 2nd Qtr. 2022. Initial Operational Test & Evaluation moved from 2nd through 3rd Qtrs. FY 2021 to 2nd through 3rd Qtrs. FY 2022. AERO Flight Readiness Review moved from 4th Qtr. FY 2018 to 1st Qtr. FY 2020. Production Readiness Review moved from 2nd Qtr. FY 2019 to 2nd Qtr. FY 2020. System Verification Review moved from 3rd Qtr. FY 2019 to 3rd Qtr. FY 2020. System Demonstration Test Article RDTEN Contract Award moved from 2nd Qtr. FY 2019 to 4th Qtr. FY 2019. Low Rate Initial Production 1 APN-5 Contract Award moved from 4th Qtr. FY 2019 to 4th Qtr. FY 2020. Low Rate Initial Production 2 APN-5 Contract Award moved from 2nd Qtr. FY 2020 to 2nd Qtr. FY 2021. Low Rate Initial Production 3 APN-5 Contract Award moved from 2nd Qtr. FY 2021 to 2nd Qtr. FY 2022. Full Rate Production 1 APN-5 Contract Award moved from 2nd Qtr. FY 2022 to 2nd Qtr. FY 2023. System Demonstration Test Article RDTEN Deliveries moved from 3rd Qtr. FY 2020 through 1st Qtr. FY 2021 to 2nd Qtr. FY 2021 through 2nd Qtr. FY 2022. Low Rate Initial Production 1 Deliveries moved from 2nd through 4th Qtrs. FY 2021 to 3rd Qtr. FY 2022 through 2nd Qtr. FY 2023. Low Rate Initial Production 2 Deliveries moved from 3rd Qtr. FY 2021 through 4th Qtr. FY 2022 to 3rd Qtr. FY 2023. Low Rate Initial Production 3 Deliveries start moved from 4th Qtr. FY 2022 to 4th Qtr. FY 2023.

The FY 2019 funding request was reduced by $1.330M to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604274N / *Next Generation Jammer (NGJ)*	Project (Number/Name) 0557 / *Next Generation Jammer*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0557: *Next Generation Jammer*	1,255.215	559.017	632.936	459.529	-	459.529	568.662	408.105	160.999	0.000	0.000	4,044.463
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P445

A. Mission Description and Budget Item Justification

This Program Element (PE 0604274N) supports the NGJ-MB program. NGJ-MB will address AEA capability and sufficiency gaps against enemy threats operating in the middle frequency bands of the electromagnetic spectrum. NGJ-MB will provide the ability to effective engage enemy threats from increased stand-off distances, employ increased capacity (number of jamming assignments) against enemy targets, and support agile employment by operators. The NGJ-MB system will be integrated on the EA-18G tactical aircraft and replace the aging AN/ALQ-99 Tactical Jamming System Mid-Band pods.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Next Generation Jammer Mid-Band Primary Hardware Development	408.094	360.287	228.453	0.000	228.453
Articles:	-	-	-	-	-
FY 2018 Plans: Ongoing assembly and integration of the initial EDM and Aeromechanical Pods to support ground and chamber testing. The April 2017 NGJ-MB Critical Design Review (CDR) revealed deficiencies in modeling, assumptions, and methodologies that are driving a redesign of the pod structure in FY 2018. All subsystem design, development, manufacturing, integration and tests are continuing independent of the structure redesign effort.					
FY 2019 Base Plans: Deliver aeromechanical test shapes (Pods) to support store safe separation (jettison) developmental testing. Delivery of initial EDM pods to support ground chamber testing and mission systems developmental flight testing. Contract award for 7 System Demonstration Test Article Pod shipsets in 4th Qtr. FY 2019 which will be used for final developmental test efforts and operational test.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease of Next Generation Jammer Mid-Band Primary Hardware Development from FY 2018 to FY 2019 is due to the funding of the Ground Power and Cooling Modification and the Pod Power Generator Test in FY					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
2018. FY 2018 also includes funding required for the resolution of Next Generation Jammer Mid-Band pod structure challenges.					
Title: Next Generation Jammer Mid-Band Systems Engineering	39.757	52.796	56.164	0.000	56.164
Articles:	-	-	-	-	-
FY 2018 Plans: Perform Systems Engineering efforts to support the design review for the structural redesign and implementation. System engineering efforts will also support Systems Integration Lab testing at government and contractor facilities as well as establishing verification requirements for developmental flight test activities.					
FY 2019 Base Plans: Perform Systems Engineering efforts, which will support the Mission Systems TRR and FRR 2nd Qtr. FY 2019. Systems Engineering efforts will also be focused on the Production Readiness Review 2nd Qtr. FY 2020 and the System Verification Review 3rd Qtr. FY 2020. System engineering efforts will continue to support Systems Integration Lab testing at government and contractor facilities and developmental ground and flight test activities.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase of Next Generation Jammer Mid-Band Systems Engineering from FY 2018 to FY 2019 is due to the commencement of Systems Engineering - Trainer in FY 2019 and escalation of other Systems Engineering efforts.					
Title: Next Generation Jammer Mid-Band Aircraft Integration	77.997	148.841	103.087	0.000	103.087
Articles:	-	-	-	-	-
FY 2018 Plans: Continue working on three SCS software builds in various stages, finish the System Integration phase of Build #1, finish the Design phase and start the System Integration phase of Build #2, and conduct the Design phase and the System Integration phases of Build #3. Installation of the first modification kits into the initial aircraft to be used for testing MGJ-MB. Finalize and deliver wind tunnel reports for the performance aeromechanical high speed wind tunnel test, stores separation wind tunnel test, and the high lift, low speed wind tunnel test.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Completion of SCS software H16 Build 2 integration activities, Build Readiness Review (BRR) for H16 Build 3 and subsequent integration, and follow on software support to meet Initial Operational Capability (IOC). Continued SIL testing and NGJ-MB A-kit installs into the developmental test and evaluation aircraft. Commence delivery and installation of A-kits to Operational Test and Evaluation aircraft. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of Next Generation Jammer Mid-Band Aircraft Integration from FY 2018 to FY 2019 is due to completion of the System Integration phase of Build #1 and the completion of the design phase of Build #2.					
Title: Next Generation Jammer Mid-Band Test and Evaluation	30.128	67.359	68.102	0.000	68.102
Articles:	-	-	-	-	-
FY 2018 Plans: Complete High Speed Stability and Control, High and Low Speed Performance, and Loads/Stores wind tunnel test reports. Plan, conduct and report Ram Air Turbine Generator (RATG) performance testing and NGJ-MB pod static loads testing. Complete Regression Ground Vibration Testing (RGVT) analysis. Plan, conduct and report on Cantilever Ground Vibration Testing (GVT). Calibrate sensors for stores load testing. Instrument an F/A-18E/F to support store loads testing. Instrument an F/A-18E/F for flying qualities and stability and control testing. Plan captive carriage flight test for weapons separation testing. Modify and instrument EA-1 and EA-2 for NGJ to support regression flight testing. Plan and initiate AN/ALQ-99 and NGJ-MB regression flight testing. Instrument three EA-18G aircraft to support mission systems ground and flight test. Finalize NGJ-MB Mission Systems Test Planning for installed system performance characterization that includes System Performance Specification verification, EA-18G Airborne Electronic Attack systems integration, regression interoperability, software integration and functionality, Electromagnetic Environmental Effects, assignment control, frequency and spatial coverage, beam capacity, beam switching, beam stabilization, Effective Isotropic Radiated Power (EIRP), antenna patterns, receive functionality, technique generation and management, Crew Vehicle Interface, aircrew workload, safety, mission planning, cybersecurity, reliability, maintainability, ground support equipment, and environmental qualifications. ***FY 2019 Base Plans:*** Complete NGJ-MB Airworthiness and Mission Systems Test Planning. Perform loads pod calibration. Modify and instrument a F/A-18E/F to support store loads testing. Modify F/A-18E/F aircraft to support Flying Qualities, Stability and Control, Performance, and Carrier Suitability flight testing. Instrument aircraft to support captive					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
carriage and jettison/adjacent stores flight testing. Execute initial ground testing to include Electromagnetic Environmental Effects, frequency and spatial coverage, beam stabilization and EIRP in the Air Combat Environment Test and Evaluation (ACETEF) Facility. Execute initial ground testing to include Basic Jamming Technique characterization in the High-Power Electronic Attack Technique Radiation (HEATR) Facility. Execute initial ground testing to include Reliability Growth Testing in the Electronic Attack Test and Evaluation System (EATES) Facility. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of funding from FY 2018 to FY 2019 reflects increased activity required to prepare for test events scheduled for FY 2020.					
Title: Next Generation Jammer Mid-Band Support & Management Services	3.041	3.653	3.723	0.000	3.723
Articles:	-	-	-	-	-
FY 2018 Plans: Provide Support and Management Services associated with the NGJ-MB Program. ***FY 2019 Base Plans:*** Provide Support and Management Services associated with the NGJ-MB Program. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of Next Generation Jammer Mid-Band Support & Management Services from FY 2018 to FY 2019 is due to escalation of efforts.					
Accomplishments/Planned Programs Subtotals	559.017	632.936	459.529	0.000	459.529

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0591: *Next Generation Jammer*	0.000	0.000	0.952	-	0.952	232.243	212.353	348.848	530.083	3,365.589	4,690.068

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The NGJ-MB program is designated an Acquisition Category 1C Major Defense Acquisition Program (MDAP), MDAP program number 445. The activity will focus on Engineering and Manufacturing Development (EMD) phase completing the design of the pod and building fifteen (15) EDM pods for developmental test.

E. Performance Metrics

The EMD phase completes the pod design. A system CDR was held 3rd Qtr. FY 2017, which revealed deficiencies in modeling, assumptions, and methodologies used in the design of the pod structure. These deficiencies are driving a redesign of the pod structure, but subsystem design, development, manufacturing, integration, and test are continuing independent of the pod structure redesign effort. First flight of an aeromechanical developmental test shape is scheduled for 1st Qtr. FY 2020. First radiating flight of an EDM Pod is scheduled for 2nd Qtr. FY 2020.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604274N / *Next Generation Jammer (NGJ)*	Project (Number/Name) 0557 / *Next Generation Jammer*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - Engineering and Manufacturing Development	C/CPIF	Raytheon : El Segundo, CA	178.425	408.094	Nov 2016	360.286	Oct 2017	228.452	Oct 2018	-		228.452	604.403	1,779.660	1,779.660
Aircraft Integration - EMD	C/CPIF	Boeing : St. Louis, MO	7.191	19.801	Dec 2016	45.757	Dec 2017	29.634	Dec 2018	-		29.634	44.824	147.207	147.207
Software/Aircraft Integration	WR	NAWCWD : China Lake, CA	21.639	9.712	Dec 2016	7.504	Nov 2017	8.071	Nov 2018	-		8.071	22.899	69.825	-
Software Integration-Systems Integration Lab	SS/FFP	Northrop Grumman : Bethpage. NY	15.353	0.000		1.955	Feb 2018	1.387	Feb 2019	-		1.387	1.604	20.299	20.299
Software Integration - SOR	C/CPIF	Boeing : St. Louis, MO	25.699	1.130	Dec 2016	3.897	Oct 2017	2.967	Oct 2018	-		2.967	1.472	35.165	35.165
Software Integration - Blk Update	WR	NAWCWD : Pt. Mugu, CA	30.409	13.354	Nov 2016	24.474	Nov 2017	19.188	Nov 2018	-		19.188	30.691	118.116	-
Software Integration H-16	C/CPIF	Boeing : St Louis, MO	10.524	20.500	Dec 2016	48.225	Oct 2017	10.351	Oct 2018	-		10.351	7.971	97.571	97.571
Software Integration H-16	SS/FFP	Northrup Grumman : Bethpage, NY	6.700	11.926	Dec 2016	16.059	Dec 2017	11.476	Dec 2018	-		11.476	16.701	62.862	62.862
Software Integration H-16	WR	NAWCWD : China Lake	0.286	1.574	Dec 2016	0.971	Nov 2017	20.014	Nov 2018	-		20.014	4.517	27.362	-
Systems Engineering - Trainer	Various	TBD : TBD	0.000	0.000		0.000	Nov 2017	3.194	Nov 2018	-		3.194	3.284	6.478	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	99.006	16.308	Nov 2016	21.662	Nov 2017	22.095	Nov 2018	-		22.095	34.032	193.103	-
Systems Engineering	WR	NAWCWD : Pt. Mugu, CA	47.003	10.371	Nov 2016	9.694	Nov 2017	9.887	Nov 2018	-		9.887	21.678	98.633	-
Systems Engineering	WR	NSWC Crane : Crane, IN	32.104	4.291	Oct 2016	4.377	Nov 2017	4.464	Nov 2018	-		4.464	6.414	51.650	-
Systems Engineering	WR	NSWC Dahlgren : Dahlgren, VA	4.151	0.102	Oct 2016	0.104	Nov 2017	0.106	Nov 2018	-		0.106	0.332	4.795	-
Systems Engineering	SS/CPFF	Johns Hopkins University Applied	39.067	4.833	Feb 2017	9.460	Feb 2018	9.649	Feb 2019	-		9.649	21.886	84.895	84.895

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Physics Lab : Laurel, MD													
Systems Engineering	WR	Naval Research Laboratory : Washington, DC	4.626	0.642	Nov 2016	0.655	Nov 2017	0.668	Nov 2018	-		0.668	1.440	8.031	-
Systems Engineering	Various	Various : Various	10.054	0.315	Nov 2016	0.218	Nov 2017	0.017	Nov 2018	-		0.017	0.052	10.656	-
Systems Engineering	SS/FFP	NSMA : Arlington, VA	1.288	2.896	Feb 2017	6.626	Feb 2018	6.082	Feb 2019	-		6.082	5.167	22.059	22.059
Prior Year Prod Dev no longer funded in FYDP	Various	Various : Various	655.820	0.000		0.000		0.000		-		0.000	0.000	655.820	-
		Subtotal	1,189.345	525.849		561.924		387.702		-		387.702	829.367	3,494.187	N/A

Remarks

Engineering Manufacturing Development (EMD) Aircraft Integration award and increase from FY 2017 to FY 2018 due to phasing of Aircraft Integration efforts.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Eng & Tech Srvc (Non FFRDC)	Various	Various : Various	28.343	2.801	Dec 2016	3.367	Dec 2017	3.434	Dec 2018	-		3.434	7.076	45.021	45.021
Prior Year Support no longer funded in FYDP	Various	Various : Various	5.382	0.000		0.000		0.000		-		0.000	0.000	5.382	-
		Subtotal	33.725	2.801		3.367		3.434		-		3.434	7.076	50.403	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development T & E	WR	NAWCAD : Patuxent River, MD	21.545	20.182	Nov 2016	49.706	Nov 2017	42.807	Nov 2018	-		42.807	219.382	353.622	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development T & E	Various	Boeing : St Louis, MO	1.000	3.500	Dec 2016	12.250	Oct 2017	16.448	Oct 2018	-		16.448	37.685	70.883	70.883
Development T & E	Various	Boeing : St Louis MO	0.000	0.000		3.750	Dec 2017	7.658	Dec 2018	-		7.658	25.414	36.822	36.822
Development T & E - Wind Tunnel	WR	Various : AEDC	1.500	2.511	Nov 2016	0.000		0.000		-		0.000	0.000	4.011	-
Development T & E - Wind Tunnel	WR	Various : NASA AMES	0.913	3.480	Apr 2017	0.000		0.000		-		0.000	0.000	4.393	-
Test OT	Various	Various : Various	0.275	0.454	Mar 2017	1.653	Mar 2018	1.189	Mar 2019	-		1.189	17.959	21.530	-
Prior year T&E no longer funded in the FYDP	Various	Various : Various	6.121	0.000		0.000		0.000		-		0.000	0.000	6.121	-
		Subtotal	31.354	30.127		67.359		68.102		-		68.102	300.440	497.382	N/A

Remarks

Increase of Test & Evaluation funding from FY 2017 to FY 2018 and FY 2018 to FY 2019 is due to phasing of Next Generation Jammer-Mid Band (NGJ-MB) test program.

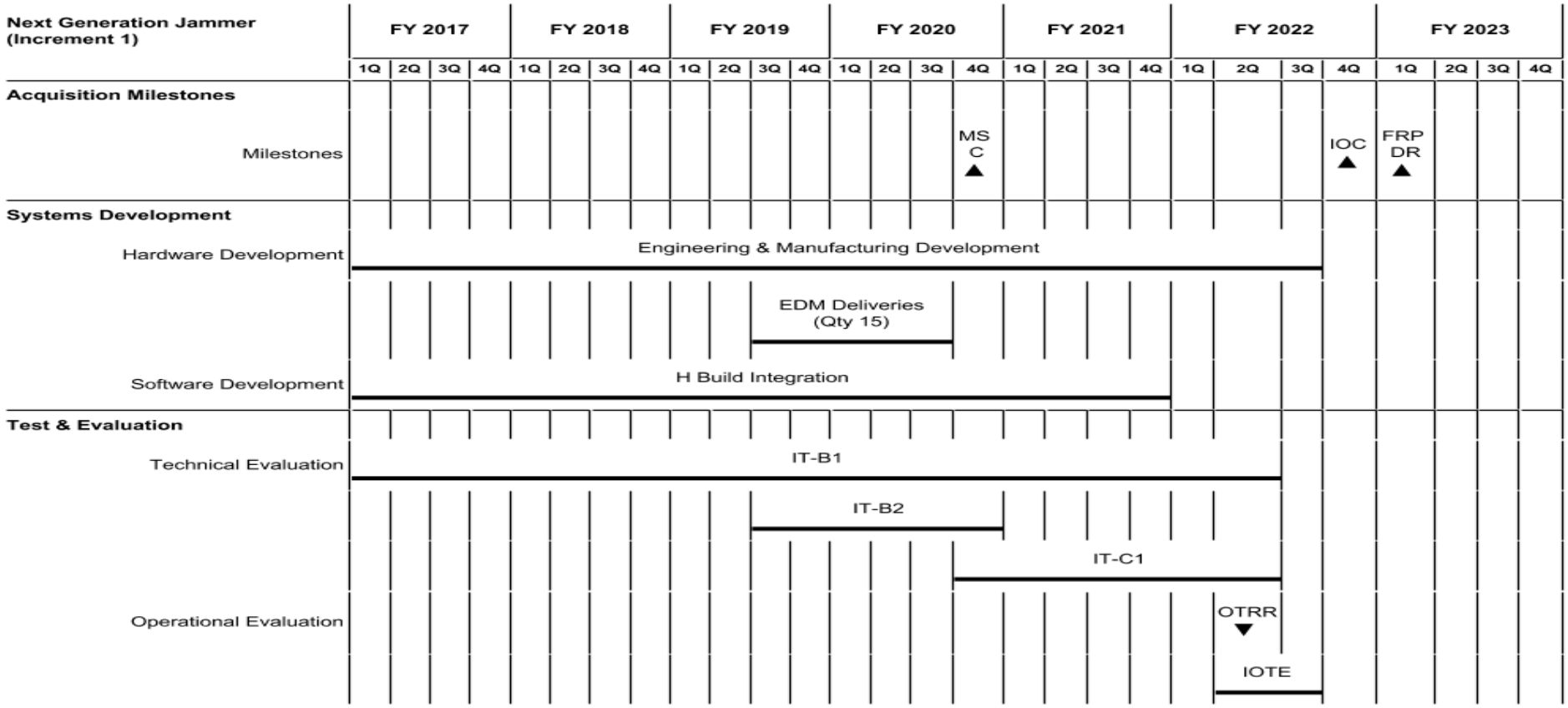
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	Various : Various	0.784	0.240	Oct 2016	0.286	Oct 2017	0.291	Oct 2018	-		0.291	0.883	2.484	-
Prior years Mgmt Svcs no longer funded in the FYDP	WR	Various : Various	0.007	0.000		0.000		0.000		-		0.000	0.000	0.007	-
		Subtotal	0.791	0.240		0.286		0.291		-		0.291	0.883	2.491	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,255.215	559.017		632.936		459.529		-		459.529	1,137.766	4,044.463	N/A

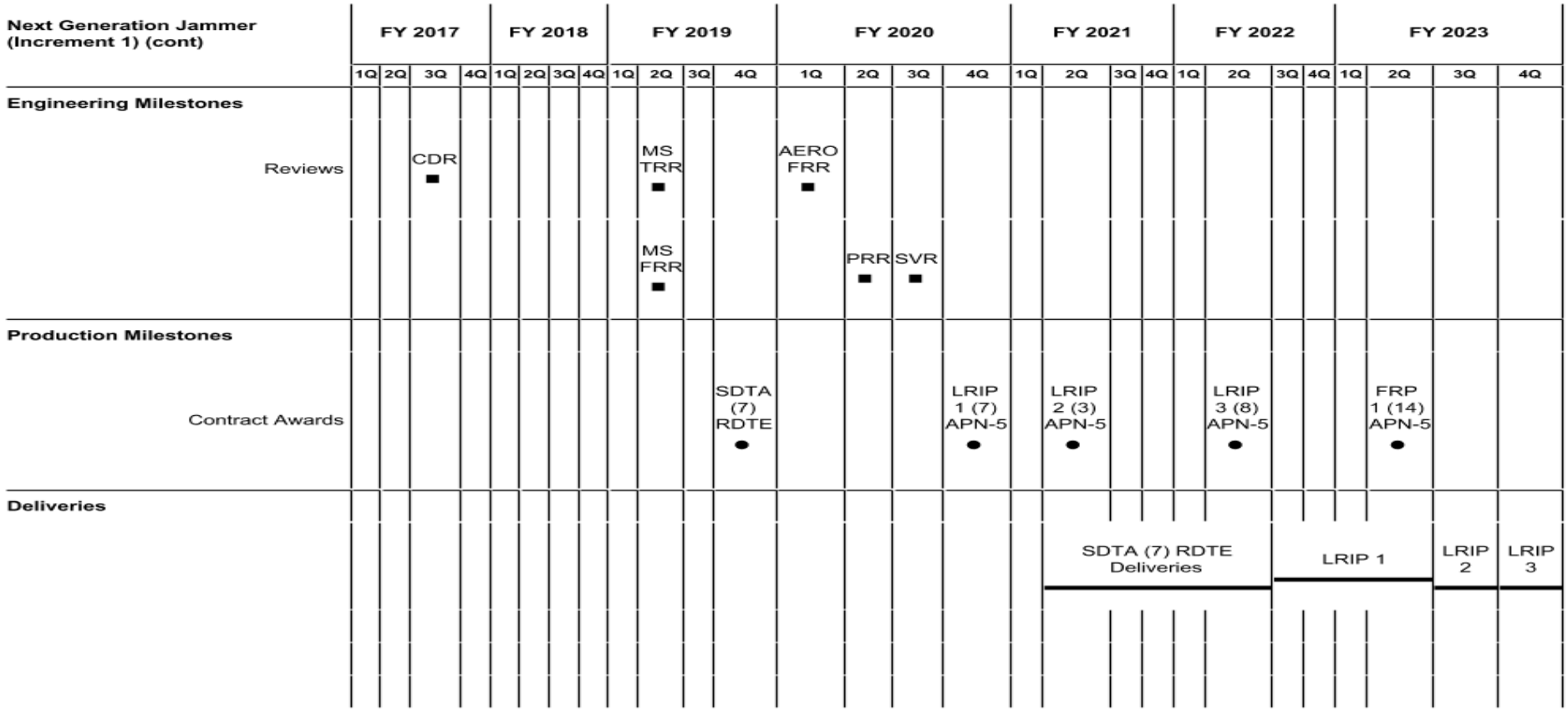
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*



2019PB - 0604274N - 0557

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*



2019PB - 0604274N - 0557

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Next Generation Jammer (Increment 1)				
Acquisition Milestones: Milestones: Milestone C	4	2020	4	2020
Acquisition Milestones: Milestones: Initital Operational Capability	4	2022	4	2022
Acquisition Milestones: Milestones: Full Rate Production Decision Review	1	2023	1	2023
Systems Development: Hardware Development: Engineering & Manufacturing Development	1	2017	3	2022
Systems Development: Hardware Development: Engineering Development Model Deliveries	3	2019	3	2020
Systems Development: Software Development: H Build Integration	1	2017	4	2021
Test & Evaluation: Technical Evaluation: Aeromechanical Testing (IT-B1)	1	2017	2	2022
Test & Evaluation: Technical Evaluation: Mission Systems Testing (IT-B2)	3	2019	4	2020
Test & Evaluation: Technical Evaluation: Mission Systems Testing (IT-C1)	4	2020	2	2022
Test & Evaluation: Operational Evaluation: Operational Test Readiness Review	2	2022	2	2022
Test & Evaluation: Operational Evaluation: Initial Operational Test & Evaluation	2	2022	3	2022
Next Generation Jammer (Increment 1) (cont)				
Engineering Milestones: Reviews: Critical Design Review	3	2017	3	2017
Engineering Milestones: Reviews: AERO Flight Readiness Review	1	2020	1	2020
Engineering Milestones: Reviews: MS Test Readiness Review	2	2019	2	2019
Engineering Milestones: Reviews: MS Flight Readiness Review	2	2019	2	2019
Engineering Milestones: Reviews: Production Readiness Review	2	2020	2	2020
Engineering Milestones: Reviews: System Verification Review	3	2020	3	2020
Production Milestones: Contract Awards: System Demonstration Test Article RDTEN Contract Award	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604274N / *Next Generation Jammer (NGJ)*	**Project (Number/Name)** 0557 / *Next Generation Jammer*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Contract Awards: Low Rate Initial Production 1 APN-5 Contract Award	4	2020	4	2020
Production Milestones: Contract Awards: Low Rate Initial Production 2 APN-5 Contract Award	2	2021	2	2021
Production Milestones: Contract Awards: Low Rate Initial Production 3 APN-5 Contract Award	2	2022	2	2022
Production Milestones: Contract Awards: Full Rate Production 1 APN-5 Contract Award	2	2023	2	2023
Deliveries: System Demonstration Test Article RDTEN Deliveries	2	2021	2	2022
Deliveries: LRIP 1 Deliveries	3	2022	2	2023
Deliveries: LRIP 2 Deliveries	3	2023	3	2023
Deliveries: LRIP 3 Deliveries	4	2023	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604280N *I JT Tact Radio Sys (JTRS)*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	38.878	2.295	4.310	3.272	-	3.272	3.271	3.015	3.029	6.437	Continuing	Continuing
3078: *Digital Modular Radio*	38.878	2.295	4.310	3.272	-	3.272	3.271	3.015	3.029	6.437	Continuing	Continuing

A. Mission Description and Budget Item Justification

Digital Modular Radio (DMR) with Integrated Waveform (IW) and Mobile User Objective System (MUOS) capable hardware is the Navy's technical solution for the IW/ MUOS requirement. The DMR AN/USC-61(C), is the first software defined radio to become a communications system standard for the U.S. Military. The compact, multi-channel DMR provides multiple waveforms and multi-level information security for voice and data communications. DMR radios currently operate aboard U.S. Navy surface and subsurface vessels, fixed-sites and other Department of Defense communication platforms using frequencies ranging from 2 MHz to 2 GHz. Certified to pass secure voice and data at Multiple Independent Levels of Security (MILS) over High Frequency (HF), Very High Frequency (VHF), Ultra High Frequency (UHF), and Satellite Communications (SATCOM) channels, the DMR system was developed to the U.S. Navy's specifications and meets all the stringent environmental, Electromagnetic Interference (EMI) and performance requirements for use in the U.S. Fleet. This program is for continued development/integration of the IW and MUOS waveforms into the DMR. Additionally, the enhancements of High Frequency Distribution Amplifier Group (HFDAG) and HF Automated Link Establishment (ALE) will also be developed/integrated into the DMR. HFDAG is a follow-on HF solution to fulfill transmit and receive HF communication capability with various modes of operation, such as ALE, for Navy platforms. HFDAG will utilize the existing DMR as the exciter/receiver. Generation 3 (GEN 3) HF ALE/HF wideband provides Navy users with improved HF communications, increased transmission rates from radio to radio, and serves as a supplement to SATCOM when SATCOM networks are overloaded or unavailable. IW uses a Time Division Multiple Access (TDMA) communication system in an attempt to improve satellite bandwidth utilization over legacy SATCOM waveforms. This enables demand assigned services on UHF SATCOM networks to support new applications that require better performance and higher channel throughput. The MUOS waveform will enable MUOS satellites to provide worldwide communication satellite coverage for DoD requirements. MUOS will provide functionality comparable to commercial mobile phone systems.

The budget in FY19 provides funding to commence development of updated DMR Cryptographic Equipment Application (CEA) software to be compliant with the latest National Security Agency (NSA) THORNTON Cryptographic Modernization (TCM) specification. Upgraded DMR CEA is necessary to support SATCOM user terminals as well as the IW. The current crypto algorithm is end of life and NSA has mandated all SATCOM programs modernize to the new algorithm and be re-certified.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604280N *I JT Tact Radio Sys (JTRS)*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	2.365	4.310	0.015	-	0.015
Current President's Budget	2.295	4.310	3.272	-	3.272
Total Adjustments	-0.070	0.000	3.257	-	3.257
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.067	0.000			
• Program Adjustments	0.000	0.000	3.293	-	3.293
• Rate/Misc Adjustments	0.000	0.000	-0.036	-	-0.036
• Congressional General Reductions Adjustments	-0.003	-	-	-	-

Change Summary Explanation

Funding increase from PB18 to PB19 in FY 2019 is commence the next development stage for Digital Modular Radio (DMR), Cryptographic Modernization Software Development.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604280N / *JT Tact Radio Sys (JTRS)*				Project (Number/Name) 3078 / *Digital Modular Radio*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3078: *Digital Modular Radio*	38.878	2.295	4.310	3.272	-	3.272	3.271	3.015	3.029	6.437	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Digital Modular Radio (DMR) with Integrated Waveform (IW) and Mobile User Objective System (MUOS) capable hardware is the Navy's technical solution for the IW/ MUOS requirement. The DMR AN/USC-61(C), is the first software defined radio to become a communications system standard for the U.S. Military. The compact, multi-channel DMR provides multiple waveforms and multi-level information security for voice and data communications. DMR radios currently operate aboard U.S. Navy surface and subsurface vessels, fixed-sites and other Department of Defense communication platforms using frequencies ranging from 2 MHz to 2 GHz. Certified to pass secure voice and data at Multiple Independent Levels of Security (MILS) over High Frequency (HF), Very High Frequency (VHF), Ultra High Frequency (UHF), and Satellite Communications (SATCOM) channels, the DMR system was developed to the U.S. Navy's specifications and meets all the stringent environmental, Electromagnetic Interference (EMI) and performance requirements for use in the U.S. Fleet. This program is for continued development/integration of the IW and MUOS waveforms into the DMR in accordance with Military Standards 188-181,2,3. Additionally, the enhancements of High Frequency Distribution Amplifier Group (HFDAG) and HF Automated Link Establishment (ALE) will also be developed/integrated into the DMR. HFDAG is a follow-on HF solution to fulfill transmit and receive HF communication capability with various modes of operation, such as ALE, for Navy platforms. HFDAG will utilize the existing DMR as the exciter/receiver. Generation 3 (GEN 3) HF ALE/HF wideband provides Navy users with improved HF communications, increased transmission rates from radio to radio, and serves as a supplement to SATCOM when SATCOM networks are overloaded or unavailable. IW uses a Time Division Multiple Access (TDMA) communication system in an attempt to improve satellite bandwidth utilization over legacy SATCOM waveforms. This enables demand assigned services on UHF SATCOM networks to support new applications that require better performance and higher channel throughput. The MUOS waveform will enable MUOS satellites to provide worldwide communication satellite coverage for DoD requirements. MUOS will provide functionality comparable to commercial mobile phone systems.

The budget in FY19 provides funding to commence development of updated DMR Cryptographic Equipment Application (CEA) software to be compliant with the latest National Security Agency (NSA) THORNTON Cryptographic Modernization (TCM) specification. Upgraded DMR CEA is necessary to support SATCOM user terminals as well as the IW. The current crypto algorithm is end of life and NSA has mandated all SATCOM programs modernize to the new algorithm and be re-certified.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Title: DMR	2.295	4.310	3.272	0.000	3.272
Articles:	-	-	-	-	-
Description: Overall program efforts include investigation of emerging technologies through study, development and associated testing for feasibility of program insertion. DMR is the Navy's primary solution for providing the UHF SATCOM IW and MUOS waveform to the Fleet.					
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604280N / *JT Tact Radio Sys (JTRS)*	**Project (Number/Name)** 3078 / *Digital Modular Radio*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete at-sea development testing and waveform conformance testing of the Integrated Waveform (IW)/ Mobile User Objective System (MUOS) waveforms into the Digital Modular Radio (DMR) system. Conduct a Government Run for Record in support of IW/MUOS and High Frequency Amplifier Link Establishment (HF ALE) software. Complete the development of IW/MUOS software and DMR HF ALE Generation 3 (GEN3) Software efforts and Joint Integration Test Command (JITC) interoperability certification. Receive MUOS and HF ALE GEN3 software drops from vendor for testing and Release Requirements Review (RRR) efforts. ***FY 2019 Base Plans:*** Commence the software development effort needed to ensure DMR Cryptographic Equipment Application (CEA) is compatible with National Security Agency (NSA) required certified software. Provide engineering support services for reviewing the THORNTON Cryptographic Modernization specification and reevaluating the DMR Ultra High Frequency (UHF) Satellite Communications (SATCOM) Transmission Security (TRANSEC) Crypto to ensure capability integration with new and legacy CEA. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease from FY 2018 to FY 2019 is due to the completion of MUOS development. FY 2019 RDTE is to commence the next development stage for DMR, Cryptographic Modernization Software Development.					
Accomplishments/Planned Programs Subtotals	2.295	4.310	3.272	0.000	3.272

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/3010: *DMR OPN*	9.671	23.695	45.450	-	45.450	66.478	71.213	63.190	65.112	Continuing	Continuing

Remarks

D. Acquisition Strategy

General Dynamics Mission Systems (GDMS), formerly General Dynamics C4 Systems (GDC4S), owns the technical data rights to the DMR. Due to this fact, they are the only contractor with the unique capabilities and technical know-how to perform the required design work to complete the IW upgrade, the MUOS interoperability efforts, and Cryptographic Modernization development.

E. Performance Metrics

Military Standard (MIL-STD) conformance to meet Joint Integration Test Command (JITC) Certification for IW/UHF SATCOM waveform and the MUOS waveform.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604280N / *JT Tact Radio Sys (JTRS)*	Project (Number/Name) 3078 / *Digital Modular Radio*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IW/MUOS Development	C/CPIF	GDMS : Scottsdate, AZ	20.432	0.800	May 2017	1.760	Oct 2017	0.000		-		0.000	0.000	22.992	-
HF ALE Development	C/CPIF	GDMS : Scottsdale, AZ	7.646	0.000		0.702	Oct 2017	0.000		-		0.000	0.000	8.348	-
IW/MUOS Development	WR	SSC PAC : San Diego, CA	0.000	0.600	Nov 2016	0.000		0.000		-		0.000	0.000	0.600	-
HF ALE Development	WR	SSC PAC : San Diego, CA	0.000	0.242	Nov 2016	0.163	Oct 2017	0.000		-		0.000	0.000	0.405	-
Cryptographic Modernization Development	C/CPIF	GDMS : Scottsdale, AZ	0.000	0.000		0.000		2.072	Oct 2018	-		2.072	Continuing	Continuing	Continuing
		Subtotal	28.078	1.642		2.625		2.072		-		2.072	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering Support	Various	SSC PAC : San Diego, CA	6.255	0.306	Nov 2016	1.086	Nov 2017	0.600	Dec 2018	-		0.600	Continuing	Continuing	Continuing
		Subtotal	6.255	0.306		1.086		0.600		-		0.600	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing	Various	SSC PAC : San Diego, CA	1.976	0.220	Nov 2016	0.199	Feb 2018	0.000		-		0.000	0.000	2.395	-
JITC Testing	WR	JITC : Ft. Huachuca, AZ	0.250	0.080	May 2017	0.200	Nov 2017	0.000		-		0.000	0.000	0.530	-
Interoperability Testing	WR	SSC PAC : San Diego, CA	0.000	0.000		0.000		0.200	Dec 2018	-		0.200	Continuing	Continuing	Continuing
Test and Evaluation	Various	TBD : TBD	0.000	0.000		0.000		0.200	Dec 2018	-		0.200	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604280N / *JT Tact Radio Sys (JTRS)*	Project (Number/Name) 3078 / *Digital Modular Radio*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			2.226	0.300		0.399		0.400		-		0.400	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	BAH : San Diego, CA	2.319	0.047	Nov 2016	0.200	Feb 2018	0.200	Nov 2018	-		0.200	Continuing	Continuing	Continuing
Subtotal			2.319	0.047		0.200		0.200		-		0.200	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	38.878	2.295		4.310		3.272		-		3.272	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604280N / *JT Tact Radio Sys (JTRS)*	**Project (Number/Name)** 3078 / *Digital Modular Radio*

DMR

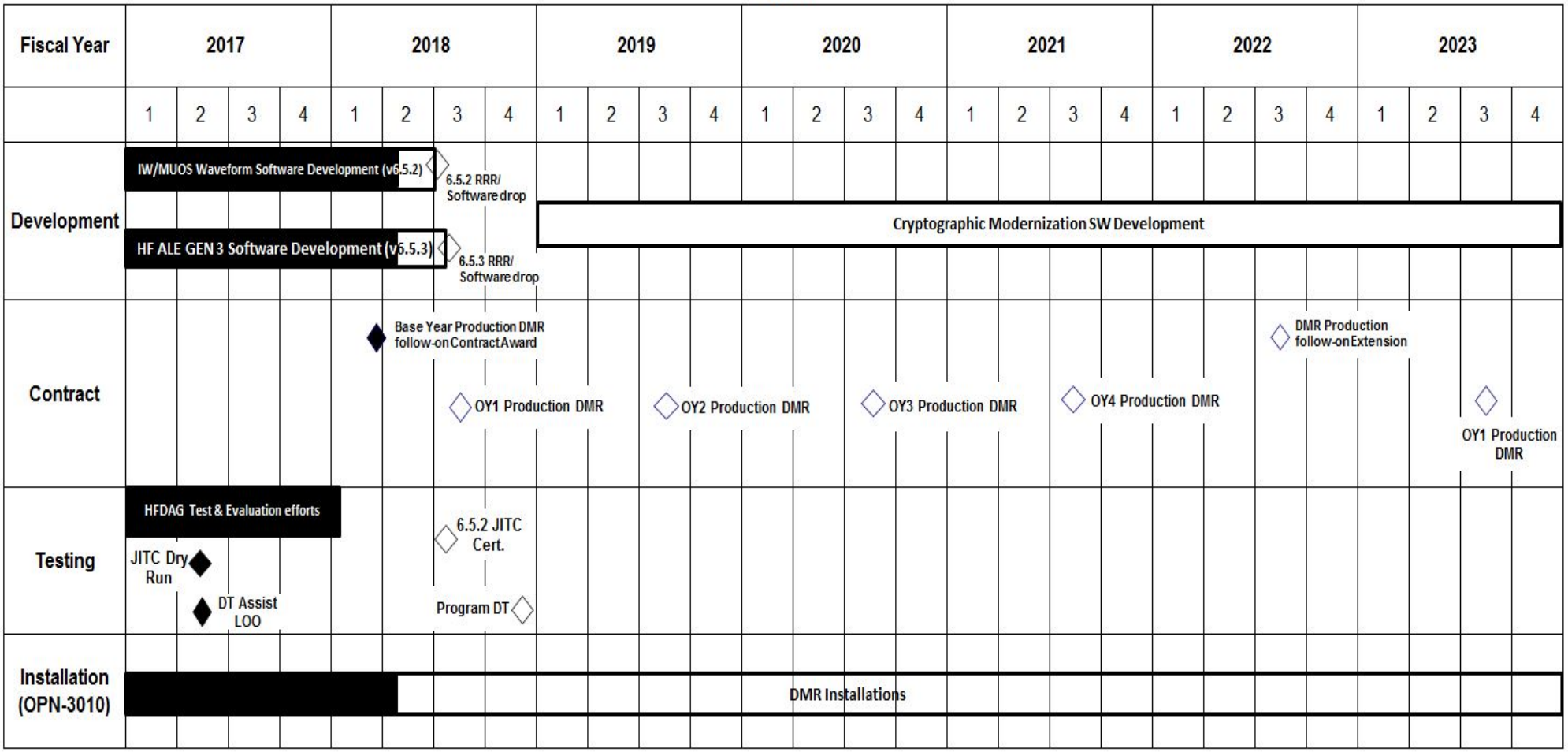


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604280N / *JT Tact Radio Sys (JTRS)*	**Project (Number/Name)** 3078 / *Digital Modular Radio*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3078				
IW Development	1	2017	2	2018
MUOS Waveform Development	1	2017	2	2018
HFDAG Test and Evaluation	1	2017	1	2018
MUOS Release Requirements Review Software Drop (v6.5.2)	3	2018	3	2018
HF ALE GEN 3 s/w Development	1	2017	3	2018
HF ALE GEN 3 Release Requirements Review Software Drop (v6.5.3)	3	2018	3	2018
Production Deliveries	1	2017	4	2023
Development Testing (DT)	4	2018	4	2018
IW JITC Dry-Run	2	2017	2	2017
Letter of Observation (LOO)	2	2017	2	2017
IW JITC Certification	3	2018	3	2018
Cryptographic Modernization SW Development	1	2019	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604282N *I (U)Next Generation Jammer (NGJ) Increment II*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	12.306	18.964	66.686	115.253	-	115.253	169.567	207.866	237.848	241.754	2,536.714	3,606.958
3380: *Next Generation Jammer Inc II*	12.306	18.964	66.686	115.253	-	115.253	169.567	207.866	237.848	241.754	2,536.714	3,606.958

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): P520

A. Mission Description and Budget Item Justification

The Next Generation Jammer (NGJ) is the next step in the evolution of Airborne Electronic Attack (AEA) and is a critical capability necessary to address current, emerging, and evolving Electronic Warfare gaps, ensure kill chain wholeness against growing threat capabilities and capacity, keep pace with enemy threat weapon systems' advancements, and support the continuous expansion of the AEA mission areas that exceed the capability of currently fielded systems. NGJ will utilize enhanced techniques and tactics to deliver significantly improved radar and communications jamming effectiveness as well as other classified capabilities. Utilizing an Open Systems Architecture that supports software and hardware updates to rapidly counter emergent and evolving threats, NGJ is a key enabler and force multiplier for operations across the spectrum of missions defined in the Defense Strategic Guidance, including strike warfare, projecting power despite anti-access/area denial challenges, and counterinsurgency/irregular warfare. NGJ will also address the shortfalls in scalability, flexibility, supportability, interoperability, availability, and capability of the existing AN/ALQ-99 Tactical Jamming System.

This Program Element (PE 0604282N) supports the Next Generation Jammer - Low Band (NGJ-LB) (formerly known as Next Generation Jammer Increment 2) program. NGJ-LB will address AEA capability and sufficiency gaps against enemy threats operating in the lower frequency bands of the electromagnetic spectrum. NGJ-LB will provide the ability to effectively engage enemy threats from increased stand-off distances, employ increased capacity (number of jamming assignments) against enemy targets, and support agile employment by operators. The NGJ-LB system will be integrated on the EA-18G tactical aircraft and replace the aging AN/ALQ-99 Tactical Jamming System Low-Band pods.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604282N *I (U)Next Generation Jammer (NGJ) Increment II*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	52.065	66.686	116.550	-	116.550
Current President's Budget	18.964	66.686	115.253	-	115.253
Total Adjustments	-33.101	0.000	-1.297	-	-1.297
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.001	0.000			
• Program Adjustments	0.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	-1.297	-	-1.297
• Congressional Directed Reductions Adjustments	-33.100	-	-	-	-

Change Summary Explanation

Technical: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	Project (Number/Name) 3380 / *Next Generation Jammer Inc II*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3380: *Next Generation Jammer Inc II*	12.306	18.964	66.686	115.253	-	115.253	169.567	207.866	237.848	241.754	2,536.714	3,606.958
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P520

A. Mission Description and Budget Item Justification

This Program Element (PE 0604282N) supports the NGJ-LB program. NGJ-LB will address Airborne Electronic Attack (AEA) capability and sufficiency gaps against enemy threats operating in the lower frequency bands of the electromagnetic spectrum. NGJ-LB will provide the ability to effectively engage enemy threats from increased stand-off distances, employ increased capacity (number of jamming assignments) against enemy targets, and support agile employment by operators. The NGJ-LB system will be integrated on the EA-18G tactical aircraft and replace the aging AN/ALQ-99 Tactical Jamming System Low-Band pods.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Next Generation Jammer Low Band Primary Hardware Development	6.773	25.043	76.868	0.000	76.868
Articles:	-	-	-	-	-
FY 2018 Plans: Release the DET Request for Proposal (RFP), award and begin execution of the three NGJ-LB DET contracts to include DET design reviews and hardware build approvals, leading up to NGJ-LB Engineering and Manufacturing Development (EMD), Development Request for Proposal Decision Release Point (DRRDP) in FY2019.					
FY 2019 Base Plans: Continue execution of the three NGJ Low Band technology demonstration contracts. Complete DRRDP 1QFY2019 and release EMD RFP in 2QFY2019.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase from FY 2018 to FY 2019 due to the award of three Demonstration of Existing Technologies (DET) contracts in 4QFY2018.					
Title: Next Generation Jammer Low Band Systems Engineering	11.129	30.120	29.740	0.000	29.740
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	**Project (Number/Name)** 3380 / *Next Generation Jammer Inc II*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continue Systems Engineering efforts in support of Low band development to include conducting the Integrated Logistics Assessment and finalizing the performance specification and Statement of Work in preparation for the DRRDP and release of the EMD RFP in FY 2019. Continue development of the NGJ-LB specific CDD and the Low Band Acquisition Strategy. ***FY 2019 Base Plans:*** Start source selection for the NGJ-LB Engineering and Manufacturing Development (EMD) contract for award in FY 2020. Complete preparation for and execute NGJ-LB System Readiness Review (SRR-1). Complete and finalize NGJ-LB CDD and Acquisition Strategy. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Title: Next Generation Jammer Low Band Support & Management Services	0.954	1.054	1.040	0.000	1.040
Articles:	-	-	-	-	-
FY 2018 Plans: Provide Support and Management Services associated with the NGJ-LB Program. ***FY 2019 Base Plans:*** Provide Support and Management Services associated with the NGJ-LB Program. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 2018 to FY 2019 due to CSS efficiencies.					
Title: Next Generation Jammer Low Band Aircraft Integration	0.000	3.085	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Utilize information gained from trade studies and technology demonstrations to begin development of the Statement of Requirements (SOR) for the aircraft System Configuration Set (SCS) software build required for					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	**Project (Number/Name)** 3380 / *Next Generation Jammer Inc II*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
integration of NGJ-LB physical and software interfaces into the EA-18G. Complete aircraft integration Statement of Work (SOW) and award contract to begin aircraft integration studies. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 2018 to FY 2019 due to additional aircraft integration efforts not required until FY 2020.					
Title: Next Generation Jammer Low Band Test & Evaluation	0.108	7.384	7.605	0.000	7.605
Articles:	-	-	-	-	-
FY 2018 Plans: Test & Evaluation activities include finalizing the MS B TEMP. Additional efforts include activities to scope initial aeromechanical flight test program and scoping of the initial mission system and integration flight test program. Continue resource and infrastructure improvements. ***FY 2019 Base Plans:*** Begin execution of tests for each DET contractor at the Facility for Antenna Radar Cross Section Measurements (FARM) and continue execution of resource and infrastructure improvements plan. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY 2018 to FY 2019 due to the start of DET testing in 4QFY2019 and continued resource and infrastructure improvements to support future NGJ-LB testing.					
Accomplishments/Planned Programs Subtotals	18.964	66.686	115.253	0.000	115.253

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	**Project (Number/Name)** 3380 / *Next Generation Jammer Inc II*

D. Acquisition Strategy

NGJ-LB program is designated a pre-Major Defense Acquisition Program (pre-MDAP), MDAP program number P520. The activity will focus on trade studies to inform the acquisition strategy, design engineering trades, and the identification of requirements and available technologies for program entry at Milestone B. Activity will also support execution of three DET contracts to validate existing technology maturity for low band applications on the EA-18G.

E. Performance Metrics

Utilize studies and technology demonstration efforts for favorable SRR-1 and System Functional Review (SFR) in 1QFY2019 and preparation for the Development Request for Proposal Release Decision Point (DRRDP) 1QFY2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	Project (Number/Name) 3380 / *Next Generation Jammer Inc II*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary H/W Dev - Trade Studies	SS/CPFF	JHU : Laurel, MD	5.265	3.050	Jan 2017	0.000		0.000		-		0.000	0.000	8.315	8.315
Primary H/W Dev - Trade Studies	WR	NSWC Crane : Crane, IN	1.539	0.800	Jan 2017	0.000		0.000		-		0.000	0.000	2.339	-
Primary H/W Dev - Trade Studies	WR	NAWCAD : Patuxent River, MD	1.921	1.195	Dec 2016	0.000		0.000		-		0.000	0.000	3.116	-
Primary H/W Dev - Trade Studies	WR	NAWCWD : Point Mugu, CA	0.434	0.400	Dec 2016	0.000		0.000		-		0.000	0.000	0.834	-
Primary H/W Dev - Aircraft Specification Refinement	SS/CPIF	Boeing : St. Louis, MO	0.000	1.300	Sep 2017	1.600	Mar 2018	2.000	Feb 2019	-		2.000	2.040	6.940	6.940
Primary H/W Dev - Technology Demonstrators 1	C/CPFF	TBD : TBD	0.000	0.000		7.814	Jul 2018	24.956	Oct 2018	-		24.956	28.500	61.270	61.270
Primary H/W Dev - Technology Demonstrators 2	C/CPFF	TBD : TBD	0.000	0.000		7.814	Jul 2018	24.956	Oct 2018	-		24.956	28.500	61.270	61.270
Primary H/W Dev - Technology Demonstrators 3	C/CPFF	TBD : TBD	0.000	0.000		7.814	Jul 2018	24.956	Oct 2018	-		24.956	28.500	61.270	61.270
Primary H/W Dev - EMD	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	1,908.536	1,908.536	1,908.536
Aircraft Integration - Study	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	59.988	59.988	-
Aircraft Integration	Various	Various : Various	0.000	0.000		3.085	Dec 2017	0.000		-		0.000	0.000	3.085	3.085
Aircraft Integration - EMD	SS/CPIF	Boeing : St. Louis, MO	0.000	0.000		0.000		0.000		-		0.000	188.560	188.560	188.560
Software Integration	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	4.063	4.063	-
Software Integration	SS/CPIF	Boeing : St. Louis, MO	0.000	0.000		0.000		0.000		-		0.000	93.689	93.689	93.689
Software Integration	SS/CPIF	NGC : Bethpage, NY	0.000	0.000		0.000		0.000		-		0.000	97.088	97.088	97.088
Software Integration	WR	NAWCWD : Point Mugu, CA	0.000	0.000		0.000		0.000		-		0.000	89.194	89.194	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	**Project (Number/Name)** 3380 / *Next Generation Jammer Inc II*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	TBD	NSMA : Arlington, VA	0.000	0.000		0.000		0.000		-		0.000	21.054	21.054	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.405	6.651	Dec 2016	20.205	Dec 2017	17.367	Dec 2018	-		17.367	148.721	194.349	-
Systems Engineering	WR	NAWCWD : Point Mugu, CA	1.070	1.710	Dec 2016	3.668	Dec 2017	4.850	Dec 2018	-		4.850	85.027	96.325	-
Systems Engineering	WR	NSWC Crane : Crane, IN	0.456	0.775	Jan 2017	3.736	Dec 2017	3.810	Dec 2018	-		3.810	35.183	43.960	-
Systems Engineering	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.066	Jan 2017	0.131	Dec 2017	0.134	Dec 2018	-		0.134	1.493	1.824	-
Systems Engineering	SS/CPFF	JHU : Laurel, MD	0.000	1.900	Jan 2017	2.130	Dec 2017	3.325	Dec 2018	-		3.325	70.306	77.661	77.661
Systems Engineering	Various	Various : Various	0.000	0.055	Dec 2016	0.250	Dec 2017	0.255	Dec 2018	-		0.255	2.848	3.408	-
Systems Engineering - Trainer	TBD	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	7.035	7.035	-
		Subtotal	12.090	17.902		58.247		106.609		-		106.609	2,900.325	3,095.173	N/A

Remarks

Primary Hardware Development - Technology Demonstrators (1,2,3) increase from FY 2018 to FY 2019 due to having 3 planned demonstrators completing technology demonstration design, reviews and hardware build approvals for the Development Request for Proposal Decision Release Point.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Eng & Tech Srvc (Non FFRDC)	Various	Various : Various	0.215	0.925	Dec 2016	0.944	Dec 2017	0.926	Dec 2018	-		0.926	11.366	14.376	14.376
		Subtotal	0.215	0.925		0.944		0.926		-		0.926	11.366	14.376	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	**Project (Number/Name)** 3380 / *Next Generation Jammer Inc II*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development T&E - TEST DT	WR	NAWCAD : Patuxent River, MD	0.000	0.000		7.274	Dec 2017	7.493	Nov 2018	-		7.493	339.143	353.910	-
Development T&E - COTF	SS/FFP	FSC : San Diego, CA	0.000	0.108	Nov 2016	0.110	Dec 2017	0.112	Nov 2018	-		0.112	3.860	4.190	4.190
Development T&E - Wind Tunnel	TBD	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	9.804	9.804	-
Development T&E VX-23/31 - Engineers	TBD	Boeing : St. Louis, MO	0.000	0.000		0.000		0.000		-		0.000	67.491	67.491	67.491
Development T&E VX-23/31 - Maintenance	TBD	Boeing : St. Louis, MO	0.000	0.000		0.000		0.000		-		0.000	37.413	37.413	37.413
Operational T&E - TEST OT	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	22.397	22.397	-
		Subtotal	0.000	0.108		7.384		7.605		-		7.605	480.108	495.205	N/A

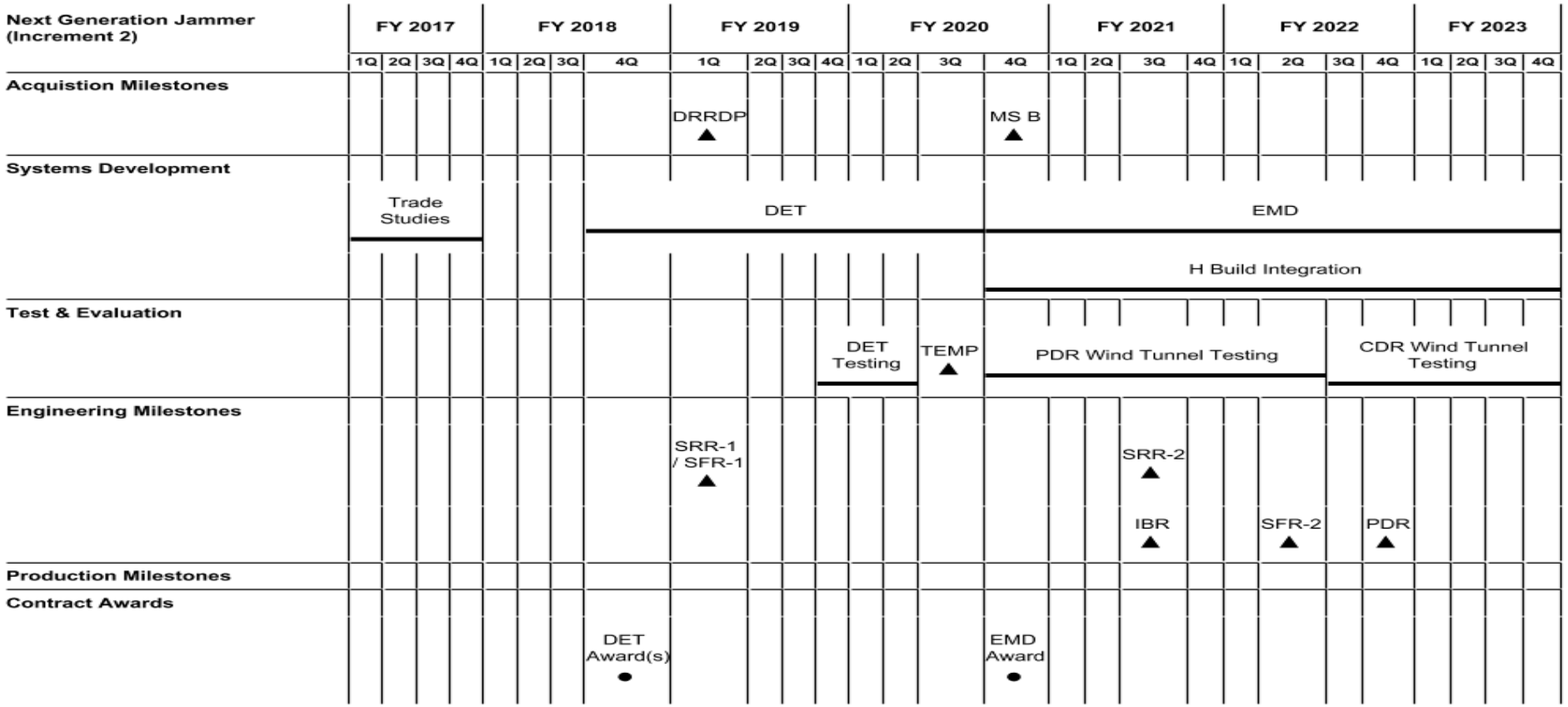
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	Various : Various	0.001	0.029	Oct 2016	0.111	Oct 2017	0.113	Oct 2018	-		0.113	1.950	2.204	-
		Subtotal	0.001	0.029		0.111		0.113		-		0.113	1.950	2.204	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.306	18.964		66.686		115.253		-		115.253	3,393.749	3,606.958	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	**Project (Number/Name)** 3380 / *Next Generation Jammer Inc II*



2019DON - 0604282N - 3380

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604282N / *(U)Next Generation Jammer (NGJ) Increment II*	**Project (Number/Name)** 3380 / *Next Generation Jammer Inc II*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Next Generation Jammer (Increment 2)				
Acquistion Milestones: Development Request for Proposal Release Decision Point (DRRDP)	1	2019	1	2019
Acquistion Milestones: Milestone B	4	2020	4	2020
Systems Development: Trade Studies	1	2017	4	2017
Systems Development: Demonstration of Existing Technologies (DET)	4	2018	3	2020
Systems Development: Engineering & Manufacturing Development (EMD)	4	2020	4	2023
Systems Development: H Build Integration	4	2020	4	2023
Test & Evaluation: DET Testing	4	2019	2	2020
Test & Evaluation: MS B Test & Evaluation Master Plan	3	2020	3	2020
Test & Evaluation: Preliminary Design Review Wind Tunnel Testing	4	2020	2	2022
Test & Evaluation: Critical Design Review Wind Tunnel Testing	3	2022	4	2023
Engineering Milestones: System Readiness Review - 1 / System Functional Review - 1	1	2019	1	2019
Engineering Milestones: System Readiness Review - 2	3	2021	3	2021
Engineering Milestones: Integrated Baseline Review	3	2021	3	2021
Engineering Milestones: System Functional Review - 2	2	2022	2	2022
Engineering Milestones: Preliminary Design Review	4	2022	4	2022
Contract Awards: DET Contract Award(s)	4	2018	4	2018
Contract Awards: Engineering and Manufacturing Development Contract Award	4	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604307N *I Surface Combatant Cmbt Sys Eng*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	3,783.665	288.678	390.238	397.403	-	397.403	343.636	309.212	279.764	284.083	Continuing	Continuing
1447: *Surf Combatant Combat System Imp*	3,756.541	275.421	382.382	390.457	-	390.457	335.773	301.446	273.360	278.609	Continuing	Continuing
3357: *Aegis Training Improvement Program*	27.124	10.355	7.856	6.946	-	6.946	7.863	7.766	6.404	5.474	Continuing	Continuing
9999: *Congressional Adds*	0.000	2.902	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.902
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 180												

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $39.750 million in Surface Combatant Combat System Improvement and $1.1 million in AEGIS Training Improvement Program to account for the availability of prior year execution balances.

This project provides Cruiser and Destroyer AEGIS Combat System (ACS) upgrades and integrates new equipment and systems to pace the threat and capture advances in technology. Examples of captured advanced technologies are: open architecture, advanced information assurance and initial cyber defense, fiber optics, distributed computing architecture, and high performance computing, all of which require corresponding AEGIS Weapon System (AWS) and ACS changes.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	282.764	390.238	419.478	-	419.478
Current President's Budget	288.678	390.238	397.403	-	397.403
Total Adjustments	5.914	0.000	-22.075	-	-22.075
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	20.500	0.000			
• SBIR/STTR Transfer	-7.578	0.000			
• Program Adjustments	0.000	0.000	-16.962	-	-16.962
• Rate/Misc Adjustments	0.000	0.000	-5.113	-	-5.113
• Congressional General Reductions Adjustments	-0.008	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604307N *I Surface Combatant Cmbt Sys Eng*			
• Congressional Directed Reductions	-10.000	-	-	-	-
Adjustments					
• Congressional Add Adjustments	3.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Small Business Technology Insertion*	2.902	0.000
Congressional Add Subtotals for Project: 9999	2.902	0.000
Congressional Add Totals for all Projects	2.902	0.000

Change Summary Explanation

FY19 1447/3357:
Added $23.564M Increase for Combat System Test Bed (CSTB). CSTB will enable the Navy to characterize end-to-end, system-of-systems Integrated Air and Missile Defense Hard Kill (HK)/Soft Kill (SK) performance.

The FY 2019 funding request was reduced by $39.750 million in Surface Combatant Combat System Improvement and $1.1 million in AEGIS Training Improvement Program to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604307N / *Surface Combatant Cmbt Sys Eng*	Project (Number/Name) 1447 / *Surf Combatant Combat System Imp*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1447: *Surf Combatant Combat System Imp*	3,756.541	275.421	382.382	390.457	-	390.457	335.773	301.446	273.360	278.609	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 180

A. Mission Description and Budget Item Justification

This project provides AEGIS Cruiser & Destroyer ACS upgrades and integrates new equipment and systems to pace the threat and capture advances in technology. ACS capabilities have continually evolved starting with AEGIS Baseline (BL) 2 on Guided Missile Cruisers (CG) 52-58, BL 3 on CG 59-64, and BL 4 on CG 65-73, BL 5 on Guided Missile Destroyer (DDG) 51-78, BL 6 on DDG 79-90, BL 7 on DDG 91-112, BL 9 starting with DDG 113 and BL 10 on First Flight III DDG.

The AEGIS Modernization Baselines will provide new technology to replace aging military equipment, extend service life, and maintain combat viability of AEGIS combatants into the future. These baselines reduce combat system maintenance life cycle costs and streamline the development of capabilities. AEGIS BL 9, consisting of an upgraded computing infrastructure and computer program enhancements, will modernize DDG 51-53, 57, 61, 65 and 69. AEGIS BL 9 will also be introduced on the new construction destroyers, DDG 113-124 and DDG 127. CG 59, 60, and 62 computer programs will also be upgraded, bringing all BL 9 warfighting improvements (with the exception of BMD). BL 9 will provide an updated computer program to BL 8 CGs (CG 52-58), improving warfighter effectiveness by introducing Naval Integrated Fire Control - Counter Air (NIFC-CA), improved SM-6 integration, capabilities to address Fleet Urgent Operational Needs (UONs), and reducing the number of AEGIS Baselines within the Fleet.

AEGIS Advanced Capability Build (ACB) 16 and the required Technical Insertions (TI) 12/12H/16 Computing and Display Plant will provide warfighter upgrades to AEGIS Cruisers and Destroyers to include improved Ballistic Missile Defense (BMD) capabilities (DDG only), SEWIP BLK II, MH-60R Integration, IFF Mode 5/S, SPQ-9B in the Fire Control Loop, Total Ship Training Capability (TSTC), Condition Based Maintenance, Combat System Boundary Defense, NIFC-CA 2019, and NIFC-CA Collateral #3. ACB16 will support 3 hardware configurations: PHASE 0 AEGIS BL 9.C2.0 TI12 will support 15 DDGs (51/52/57/61/65/69/80/113-120) and 2 AEGIS ASHORE (AA) facilities (Poland/Romania); PHASE 1 AEGIS BL 9.C2.1 / 9.A2.1 TI12H will support 2 DDGs (79/83) and 7 CGs (63-65/66/68/69/71); and PHASE 2 AEGIS BL 9.C2.2 TI16 will support 12 DDGs (81/84-88/92/94/121-124, 127) and 3 CGs (70/72/73).

AEGIS Advanced Capability Build (ACB) 20 and Technical Insertion (TI) 16 will provide critical warfighter upgrades to AEGIS FLT III Destroyers. ACB 20 combat system development and integration efforts will support the Air Missile Defense Radar (AMDR) acquisition milestone requirements and build upon ACB 16 to form the foundation for the AEGIS Flight III DDG Combat System. Provide Computer program updates that can be backfit to AEGIS TI 16 hardware configurations.

AEGIS Far Term Interoperability Improvement Plan will address the remaining interoperability issues within fielded AEGIS Combat System configurations to integrate F/A-18 Digital Air Control (Phase 1) in support of F/A-18 and F-35 Joint Strike Fighter initial deployment, integration of the Shipboard Gridlock System/Automatic Correlation (SGS/AC). These updates will be implemented in a phased approach to align with current and future AEGIS development efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

AEGIS Task Force Cyber Awakening will assess and provide corrective actions to improve AEGIS Combat System Computer Program and Hardware configurations against emerging threats within the Cyber arena. These improvements will be implemented within AEGIS Combat Systems currently under development and include updates to Boundary Defense Components (BDC).

AEGIS BL 5.4 combines AEGIS BL 5.3.9 and BMD 4.1 into single AEGIS Computer Program enabling a near simultaneous shift from AAW to BMD to AEGIS Flight I/II DDGs to ensure viability against emerging threats until end of service life (ESL). These improvements will include Computer Program updates to integrate the improved radar performance provided by the hardware upgrades to the SPY-1D radar.

AEGIS IFF MODE 4/5 Integration program will address Mode 4 issues; implement Mode 5 IFF within the Fire Control Loop for All AEGIS Baselines by 2020 to support Urgent fleet demand to support emerging warfighter requirements.

Combat Systems Test Bed (CSTB) will address the shortfalls in AEGIS Modeling & Simulation highlighted by DOT&E in BL 7, 8 and 9.1. Combat Systems Test Bed will provide automated analysis to efficiently process large amounts of M&S data. This increased data will allow a deeper understanding of Surface Combatant performance allowing the Program Office to quickly identify gaps and validate solutions to field capabilities faster.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AEGIS DEVELOPMENT SUPPORT	25.755	38.270	38.411	0.000	38.411
Articles:	-	-	-	-	-
Description: AEGIS Development Support covers the following areas: AEGIS Technical Design Agent (TDA), AEGIS System Engineering to identify and evaluate emerging threats and support R3B decision process, COTS Obsolescence evaluation, and AEGIS Development Site Operations and Maintenance. ***FY 2018 Plans:*** FY 2018 funding supports 7 development efforts at AEGIS Land Based Test Sites, implementing increased functionality to address emergent threats. AEGIS Development Support covers the following areas: AEGIS Technical Design Agent (TDA), AEGIS System Engineering to identify and evaluate emerging threats and support R3B decision process, COTS Obsolescence evaluation, and AEGIS Development Site Operations and Maintenance. The AEGIS TDA continues to evaluate Combat System configuration and provide detailed information on overall performance, identify areas where improvements can be implemented to improve the performance of the Combat System in the Air, Surface and Underwater Combat areas aligning to the 30 year Combat System plan.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
AEGIS System engineering continues to evaluate the Combat System threat capabilities and maintain the Capability Phasing Plan to ensure meaningful improvements are implemented within future Combat System upgrades to meet emergent threats. These efforts are focused on defining the next major upgrade to the AEGIS Combat System ACB20 in support to the 30 year Combat System plan. AEGIS Development Site Operation and Maintenance will support NJ Land Based Test Sites (LBTS) to ensure adequate hours are available to support the planned development efforts. In FY18 ~4550 hours are planned within budget to support AEGIS BL 5.4, AEGIS BL 5.3.12 Upgrade(IFF), AEGIS BL 6.3 Update (IFF), AEGIS BL 7.2 Update (IFF), AEGIS ACB12 (BL 9.A2), AEGIS ACB16 (9.C2) and AEGIS ACB 20 (BL 9.CX, BL 10.C0) development efforts at Combat System Engineering Development Sites (CSEDS), Program Generation Center (PGC), SPY-1A Test Facility (STF), Naval System Computing Center (NSCC), and Surface Combat System Center (SCSC). ***FY 2019 Base Plans:*** Funding increases to support an increased number of test hours required at AEGIS Land Based Test Sites to support 7 development efforts implementing increased functionality to address emergent threats, support periodic Software Licenses procurements for AEGIS Land Based Test Development sites, support Future Surface Combatant Engineering studies, and support increased DT/OT testing requirements for Baselines in development. AEGIS Development Support covers the following areas: AEGIS Technical Design Agent (TDA), AEGIS System Engineering to identify and evaluate emerging threats and support R3B decision process, COTS Obsolescence evaluation, AEGIS Development Site Operations and Maintenance, and Future Surface Combatant Engineering studies to support the Future Surface Combatant. The AEGIS TDA continues to evaluate Combat System configurations and provide detailed information on overall performance, identify areas where improvements can be implemented to improve the performance of the Combat System in the Air, Surface and Underwater Combat areas aligning to the 30 year Combat System plan. AEGIS System engineering continues to evaluate the Combat System threat capabilities and maintain the Capability Phasing Plan to ensure meaningful improvements are implemented within future Combat System upgrades to meet emergent threats. These efforts are focused on defining the next major upgrade to the AEGIS Combat System ACB20 to align with 30 year Combat System plan.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
AEGIS Development Site Operation and Maintenance will support NJ Land Based Test Sites (LBTS) to ensure adequate hours are available to support the planned development efforts. In FY19 ~4620 hours are planned within budget to support AEGIS BL 5.4 Upgrade, AEGIS BL 5.3.12 Upgrade (IFF), AEGIS BL 6.3 Update (IFF), AEGIS BL 7.2 Update (IFF), AEGIS BL 9A Update(IFF), AEGIS BL AEGIS ACB16 (9.C2) and AEGIS ACB 20 (BL 10) development efforts at Combat System Engineering Development Sites (CSEDS), Program Generation Center (PGC), SPY-1A Test Facility (STF), Naval System Computing Center (NSCC), and Surface Combat System Center (SCSC). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase to support additional test hours at Land Based Test Sites for 7 AEGIS BL Development efforts.					
Title: FAR TERM INTEROPERABILITY IMPROVEMENT PLAN (FTIIP)	4.727	15.000	15.300	0.000	15.300
Articles:	-	-	-	-	-
FY 2018 Plans: Funding increases to support 5 concurrent code development efforts required to implement Digital Air Control (DAC) improvements within AEGIS BL Development efforts to improve Battlegroup Operations of the AEGIS Weapon System. Support System Requirements definition, specification updated, functional allocation within the Combat System components, support code development, unit and system level testing of functionality identified during the FY17 time period. These requirements will be implemented on a number of AEGIS baselines including the following: - BL's under development AEGIS 9.C2, AEGIS ACB20, AEGIS BL 5.4 and fielded configurations AEGIS BL 6.3, AEGIS BL 7.2A/B. Conduct cross-program Interim Progress Reviews (IPRs) #2. ***FY 2019 Base Plans:*** Funding increases to support 5 concurrent test and evaluation efforts required to implement Digital Air Control (DAC) improvements within AEGIS BL Development efforts to improve Battlegroup Operations of the AEGIS Weapon System. Support code development, unit and system level testing of functionality. These requirements will be implemented on a number of AEGIS baselines including the following:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- BL's under development AEGIS 9.C2, AEGIS ACB20, AEGIS BL 5.4 and fielded configurations AEGIS BL 6.3, AEGIS BL 7.2A/B. Conduct cross-program Interim Progress Reviews (IPRs) #2. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase required to continue with improvements to the AEGIS Weapons System to improve interoperability within the Strike Groups of deployed units required to support the introduction of F-35 and IFF Mode 5/S data.					
Title: AEGIS BL 5.3 SEARAM INTEGRATION & TEST	3.000	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A					
Title: ADVANCED CAPABILITY BUILD 12 (BL 9.A2)	33.166	39.251	43.113	0.000	43.113
Articles:	-	-	-	-	-
FY 2018 Plans: Provide system engineering, development, integration and test support to test and certify AEGIS BL 9.A2. Support Computer Program certification efforts to upgrade BL 8 fielded CGs and BL 9 fielded CG's. Support ship installations and provide Computer Program updates to address issues identified during certification assessments in order to improve the Combat Systems operational effectiveness. Support installation of upgraded hardware in CG52, CG54, CG55, CG56, CG57, CG58, CG63 and CG64. ***FY 2019 Base Plans:*** Funding increases to support underway testing planned in support of Combat System certification for 8 AEGIS CG Modernization configurations.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Provide system engineering, development, integration and test support. Complete Demonstration Testing and Operational Testing as part of the 2-4-6 Cruiser Modernization Plan. Each CG coming out of its lay up period will require a detailed Test and Evaluation plan to evaluate the operational effectiveness of the existing and new combat system configuration installed on the ship. Complete supporting the ship installations and testing requirements for installation started in FY18. Provide Computer Program updates to address issues identified during certification assessments in order to improve the Combat Systems operational effectiveness. Support installation of upgraded hardware in CG 65 and CG 69. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase required to continue Cruiser Modernization 2-4-6 plan.					
Title: ADVANCED CAPABILITY BUILD 16 / TECHNOLOGY INSERTION 16 (BL 9.C2) ***Articles:*** ***FY 2018 Plans:*** Funding supports 2 concurrent test programs planned in support of AEGIS ACB16 for AEGIS Modernization and New Construction Ships. Provide program management, system engineering, development and test, and procurement activities to support the AEGIS ACB 16 (BL 9.C2) Phase 0, Phase 1 and Phase 2 CP 1 and CP 2 program development. Complete development and testing of AEGIS BL 9.C2.1/9.B2.1 Phase 0 CP2 Build 27. Support authorization efforts for At-Sea test events in Q2 and Q4. Conduct one Demo to demonstrate the full breadth of functionality and mitigate risk of test completion prior to certification. Continue development and testing of AEGIS BL 9.C2 Phase 2 and TI16 respectively. Merge code with Common Source Library Mainline at Build 27A. ***FY 2019 Base Plans:*** Provide program management, system engineering, development and test, and procurement activities to support the AEGIS ACB 16 (BL 9.C2) Phase 0, Phase 1 and Phase 2 CP 1 and CP 2 program development. Support AEGIS ACB 16 (BL 9.C2) Engineering assessment planned for 2nd quarter FY19. Collect and evaluate Test artifacts to support Combat System Certification planned for 1st quarter FY19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***	59.485 -	68.591 -	31.500 -	0.000 -	31.500 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding is required to continue development of AEGIS ACB16 Configurations through certification and support initial underway testing required for Combat System certification testing.					
Title: ADVANCED CAPABILITY BUILD 20 / TECHNOLOGY INSERTION 16/20	115.978	126.475	157.978	0.000	157.978
Articles:	-	-	-	-	-
FY 2018 Plans: AEGIS Baseline 10.0 will demonstrate system design maturity at IPR 1 and IPR 2. Software Incremental Reviews (SWIR) will status the progress of the code and test efforts. SWIR 1 will assess the status of the AEGIS 9.2.2 Baseline of which portions of Baseline 10.0 depends. SWIR 2 will evaluate the first Baseline 10.0 specific build from the CSL, build 28A. Modeling and Simulation (M&S) will underpin and validate system design and will be made available for the review teams leading up to the IPR. The integration of the Lockheed Martin MEDUSA M&S program with the Raytheon RAMS M&S program will continue to expand the AEGIS Baseline 10.0 M&S capability. Start Computer Program code development to support integration of all scope identified within the Naval Capabilities Document for New Construction and Modernization configuration. Computer Program development will implement code to address the following scope: SPY-6 Integration, BMD 6.0 Integration, MK-160 Updates, CIWS Sensor Coordination, and Tactical Data Link Updates. The Agile development process utilized by Baseline 10.0 will see capability incremental delivered from a specification and design level to coding and testing. Deliver the CS ISE. Establish the four New Jersey based AEGIS Baseline 10.0 Land Base Test Sites through Initial Test Capability (ITC 1.0). The SPY-6 Engineering Development Module (EDM) will be packed and shipped from ARDEL and flown to Moorestown, NJ. Site preparation at the Combat System Engineering Development Site (CSEDS) will commence in preparation of receipt of the EDM.					
FY 2019 Base Plans: Funding increase required to support continued Code Development and start preliminary Level 1-3 testing to implement the R3B approved requirements within the ACB20 Combat System Computer Program to support DDG FLT III. AEGIS Baseline 10.0 will continue to demonstrate system design maturity at IPR 3, and will provide status of progress at Software Increment Review (SWIR) 3, 4, & 5. The EDM will complete shipboard representative installation at CSEDS (ITC 1.3) and powertrain testing will begin as risk reduction to the new ship construction effort. CSL builds 30A, 31A, & 32A will be developed on a CSL development branch.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Modeling and Simulation (M&S) will underpin and validate system design and will be made available for the review teams leading up to the IPR. The integration of the CSEA MEDUSA M&S program with the AMDR RAMS M&S program will continue to expand the AEGIS Baseline 10.0 M&S capability. Computer Program code development will continue to support integration of all scope identified within the Naval Capabilities Document for New Construction and Modernization configuration. Computer Program development will implement code to address the following scope: SPY-6 Integration, BMD 6.0 Integration, MK-160 Updates, CIWS Sensor Coordination, and Tactical Data Link Updates. The Agile development process utilized by Baseline 10.0 will see capability incrementally delivered from a specification and design level to coding and testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase required to support Code Development specific to SPY-6 integration, test site equipment, and testing.					
Title: COMBAT SYSTEMS TEST BED (CSTB) ***Articles:*** ***Description:*** Combat Systems Test Bed (CSTB) will address the shortfalls in AEGIS Modeling & Simulation highlighted by DOT&E in BL 7, 8 and 9.1. Combat Systems Test Bed will provide automated analysis to efficiently process large amounts of M&S data. This increased data will allow a deeper understanding of Surface Combatant performance allowing the Program Office to quickly identify gaps and validate solutions to field capabilities faster. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** CSTB Build 2 will include: (1) At-Sea -Test event planning for ACB 16(BL 9.C2) utilizing AN/SPY-1, Weapons Control System (WCS), Command & Decision (C&D) and ESSM Block 1. (2) Assessment of new AEGIS Speed to Capability (ASToC) capabilities. (3) Analysis of performance deltas between Common Source Library (CSL) builds. CSTB Build 3 expands on the capabilities delivered in CSTB Build 2, including initial AEGIS Baseline 10 capabilities and the integration of AN/SPY-6, ESSM Block 2, and SLQ-32v(6) models. Build 3 is targeted to	0.000 -	0.000 -	23.564 -	0.000 -	23.564 -

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
support the ACB 16 Operational Test (OT) Runs for Record, and significant verification and validation (V&V) of the requisite AN/SPY-1, Weapon Control System (WCS), Command & Decision (C&D), ESSM Block 1, and SM-2 Block IIIA/IIIB model capabilities will occur in FY19. In addition to ACB 16 V&V, planning for BL 10.0 V&V will be on-going, culminating in delivery of Developmental Test (DT) and OT Accreditation Plans. Finally, CEC, CIWS, and SM-6 Block I models will continue integration and testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** CSTB will enable the Navy to characterize end-to-end, system-of-systems Integrated Air and Missile Defense Hard Kill/Soft Kill performance.					
Title: AEGIS: FIX MODE 4 / ACCELERATE 5	0.000	28.128	28.691	0.000	28.691
Articles:	-	-	-	-	-
FY 2018 Plans: This effort will start in FY18 and address emergent requirements related to fixing MODE 4 and accelerating the delivery of MODE 5 within Fielded AEGIS Baselines and Development efforts. Start Development of AEGIS Phase I IFF Integration within In-Service Baselines to support Mode 4 Inoculation and implement Mode 5 IFF within the Fire Control Loop and improve Mode 5 Interoperability. Program will be kicked off in 1QFY18 and Phase I IPR #1 will be conducted in 2QFY18 to support the development of Specification Changes (SC) for AEGIS BL 3/5/6/7/8/9 and will trigger Code Development and Integration Testing for each Baseline to address IFF Mode 4 End of Life (EOL) in 2020 within the fielded AEGIS Combat System configurations. In 4QFY18, Computer Programs will be delivered to support Certification Test of the baselines documented as part of Phase I. Phase II IFF Integration within AEGIS Baselines will capture completed code development in Phase I and implement in corrective actions within the AEGIS CSL. Phase II IPR #1 will be conducted in 3QFY18. ***FY 2019 Base Plans:*** Continue development of AEGIS Phase I/II/III IFF Integration within In-Service Baselines to support Mode 4 Inoculation and implement Mode 5 IFF within the Fire Control Loop and improve Mode 5 Interoperability.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Phase I IPR #2 will support certification for the AEGIS Combat Systems and provide direction to start AEGIS Computer Program installation. Support Integration and Testing requirements to field IFF upgrade on AEGIS BL 5/6/7/9A/9C to address IFF Mode 4 End of Life (EOL) in 2020. Phase II IFF Integration within AEGIS Baselines will capture completed code development in Phase I and implement in corrective actions within the AEGIS CSL. Improvements will focus on increased integration of MODE 5 functionality within the AEGIS Combat System to improve battlegroup interoperability. Phase II IPR #2 will be conducted in 4QFY19. Phase III IFF Integration within AEGIS Baselines will continue corrective actions within the AEGIS CSL. Phase III IPR #1 will be conducted in 3QFY19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase required to continue development of Phase I/II/III IFF updates that address use of MODE 5 data and address IFF Mode 4 End of Life within the Combat System to improve Strike Group interoperability effectiveness.					
Title: AEGIS BL 5.4 UPGRADE (PREVIOUSLY 5.3.X UPGRADE)	21.400	50.300	41.400	0.000	41.400
Articles:	-	-	-	-	-
FY 2018 Plans: Support development and engineering support of the AEGIS baseline 5.4. Phase 1 integrated AAW/BMD computer Program as part of Phase 1 implementation. Support Code Development and integration efforts to address emergent requirements related to the following capabilities: stream raid improvements, developed AEGIS Speed To Capability (ASTOC) improvements, and SM-6 capability within single computer program to improve AWS/BMD performance. Provide engineering support and resources to conduct developmental testing (DT) and system functional tests (SFTs) at land based test sites and provide artifacts to support Combat System Certification in FY19. Support IPR #1 in 1st quarter FY18. Support IPR #2 3rd quarter FY18. Support development and engineering of AEGIS Baseline 5.4 Phase 2 integrating Radar hardware improvements to improve performance against emerging threats. Support Surface Combat System Center design, installation,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
and integration of upgraded SPY hardware to support BL 5.4 testing efforts planned for FY19-21. Support the engineering studies required to install one (1) AEGIS SPY Array at Surface Combat System Center (SCSC). ***FY 2019 Base Plans:*** Continue development and engineering support of the AEGIS baseline 5.4 Phase 1 integrated AAW/BMD computer program. Continue supporting Code Development and integration efforts to address emergent requirements related to the following capabilities: stream raid improvements, developed AEGIS Speed To Capability (ASTOC) improvements, and SM-6 capability within single computer program to improve AWS/BMD performance. Provide engineering support and resources to conduct developmental testing (DT) and system functional tests (SFTs) at land based test sites and provide artifacts to support Combat System Certification in FY19. Support IPR #3 in 1st quarter FY19. Support Test Readiness Review (TRR) 2nd quarter FY19. Support Engineering Assessment (EA) 3rd quarter FY19. Support Certification in 4th quarter FY19. Support development and engineering of AEGIS Baseline 5.4 Phase 2, integrating Radar hardware improvements to improve performance against emerging threats. Complete Surface Combat System Center design, installation, and integration of upgraded SPY hardware to support BL 5.4 testing efforts planned for FY19-21. Complete engineering studies. Support System Requirements Review (SRR) in 2nd Quarter FY19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding required to complete single computer program development effort testing and certification and begin requirements definition for the Hardware update.					
Title: TASK FORCE CYBER AWAKENING (TFCA)	11.910	16.367	10.500	0.000	10.500
Articles:	-	-	-	-	-
FY 2018 Plans: Funding increase to support coding and integration of completed cybersecurity improvements in parallel with evaluation, development, and integration. AEGIS Cybersecurity Toolkit, file integrity checker, anti-malware, USB Media detection, CSTK, boundary proxy service, System incident and event manager, CASA upgrades, Common user interface, network device integrity and update manager capabilities will be completed, and undergo baseline integration during FY18. Development and engineering of computer program corrections, ID Management, certificate management, secure boot, application whitelisting, sandbox, cross domain and daily report capabilities. Integration and engineering updates necessary to integrate capabilities with each other and					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
the common user interface will also occur as these capabilities are readied for baseline integration. Planning and design efforts for follow on capability increments will continue using vulnerabilities and threats identified in FY17 to inform analysis of alternatives leading to final design. Consolidated findings of FY17 testing and system mapping data will be used to inform ongoing capability increment decisions and priorities. FY17 engineering effort to migrate combat system to CYBERSAFE criticality focused enclave architectures will continue. Finalize cyber security hardware, software, and appliance trade studies and inform future increments. Develop logistics documentation and training material. ***FY 2019 Base Plans:*** Support integration of the AEGIS Cyber Upgrades as the capabilities mature. These improvements will include AEGIS Cyber security Toolkit, file integrity checker, anti-malware, USB Media detection, boundary proxy service, System incident and event manager, CASA upgrades, Common user interface, network device integrity and update manager capabilities as they become available for integration within the AEGIS Combat System. Each of these improvements will be evaluated to determine which AEGIS BL configurations can support integration and what current development efforts can be targeted to field the improvements. Continue to develop and engineer computer program corrections, ID Management, certificate management, secure boot, application whitelisting, sandbox, cross domain and daily report capabilities. Planning and design efforts for follow on capability increments will continue using vulnerabilities and threats identified in FY18 to inform analysis of alternatives leading to final design. Consolidated findings of FY18 testing and system mapping data will be used to inform ongoing capability increment decisions and priorities. FY18 engineering effort to migrate combat system to CYBERSAFE criticality focused enclave architectures will continue. Finalize cyber security hardware, software, and appliance trade studies and inform future increments. Develop logistics documentation and training material. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding required to continue to identify and develop solutions to counter Cyber vulnerabilities within the AEGIS Weapon System.					
Accomplishments/Planned Programs Subtotals	275.421	382.382	390.457	0.000	390.457

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• R&D 0604501N: *Multi Mission Signal Processor*	2.279	2.424	2.503	-	2.503	2.567	2.856	0.000	0.000	Continuing	Continuing
• SCN 2122: *DDG 51*	3,630.751	3,640.792	5,699.221	-	5,699.221	3,837.968	5,146.448	5,196.788	5,326.153	3,803.000	113,434.092
• OPN 0900: *DDG Modernization*	429.614	603.355	487.999	-	487.999	681.567	584.972	911.570	1,057.869	Continuing	Continuing
• R&D 0604378N PU 3159: *NIFC-CA*	25.750	27.359	29.092	-	29.092	25.767	25.694	0.000	0.000	Continuing	Continuing
• OPN 5231: *Ship Missile Support Equipment (AEGIS Support Equipment)*	307.447	274.795	213.090	-	213.090	288.118	303.262	330.198	340.984	Continuing	Continuing

Remarks

D. Acquisition Strategy

Combat system improvements are implemented in baselines as described in the project mission statement. After the combat system is completed and tested, the computer program and associated equipment are delivered to the new construction shipbuilders and modernization shipyards where the computer program and equipment are installed and tested along with all other elements of the shipboard combat system and associated combat support systems. The computer program is a Government Furnished Computer Program (GFCP) deliverable to the Production Test Center for equipment test and check out. Future Combat System deliveries will be provided in Advanced Capability Builds (ACBs) and Technology Insertions (TIs) using the Combat System Engineering Agent (CSEA) contract. Additional modifications to the existing contracts will address B/L 9 completion (new construction), ACB 16 additional warfighting improvements, and ACB 20 engineering development efforts related to DDG FLT III, as approved by OPNAV.

E. Performance Metrics

Major Milestones for ACB 12 (BL 9.A2):
Completed BL 9.A2 CG 53 AEGIS Light-Off (ALO) third quarter FY17.
BL 9.A2A Combat System Certification Panel second quarter of FY18.
BL 9.A2B Combat System Certification Panel third quarter of FY18.

Major Milestones for ACB 16 (BL 9.A2/B2/C2):
Completed ACB16 BL 9.C2.0 Demonstration #1 third quarter FY17.
Completed ACB16 BL 9.C2.0 Demonstration #2 fourth quarter FY17.
ACB16 BL 9.C2.0 Combat System Certification Panel (CSCP) TI12 Configuration fourth quarter FY18.
Completed ACB16 BL 9.A2.1/C2.1 In-Progress Review (IPR) #1 first quarter FY18.
ACB16 BL 9.A2.1/C2.1 In-Progress Review (IPR) #2 fourth quarter FY18.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

ACB16 BL 9.A2.1/C2.1 Engineering Assessment (EA) #1 fourth quarter FY18.
ACB16 BL 9.A2.1/C2.1 Engineering Assessment (EA) #2 second quarter FY19.
ACB16 BL 9.A2.1 / 9.C2.1 Combat System Certification Panel (CSCP) TI12H Configuration first quarter FY20.
ACB16 BL 9.A2.2 / 9.C2.2 In-Progress Review (IPR) #1 second quarter FY19.
ACB16 BL 9.A2.2 / 9.C2.2 Engineering Assessment (EA) #1 fourth quarter FY19
ACB16 BL 9.A2.2 / 9.C2.2 Combat System Certification Panel (CSCP) TI16 Configuration first quarter FY21.

Major Milestones for ACB 20 / TI 20:
Completed ACB 20 Delta System Functional Review (SFR) third quarter FY17.
Completed ACB 20 Preliminary Design Review (PDR) first quarter FY18.
ACB 20 Critical Design Review (CDR) third quarter FY19.
ACB 20 AEGIS Light-Off (ALO) first quarter FY21.
ACB 20 Demonstration (DEMO) second quarter FY21.
ACB 20 Combat System Certification Panel second quarter FY23.
Completed Combat System Interface Support Equipment Critical Design Review (CDR) second quarter FY17.
Combat System Interface Support Equipment Delivery in fourth quarter FY18

Major Milestones for AEGIS BL 5.4 Computer Program Integration:
Completed BL 5.4 Phase 1 In-Progress Review (IPR) #1 second quarter FY17.
Completed BL 5.4 Phase 1 In-Progress Review (IPR) #2 fourth quarter FY17.
Completed BL 5.4 Phase 1 In-Progress Review (IPR) #3 first quarter FY18.
BL 5.4 Phase 1 In-Progress Review (IPR) #4 third quarter FY18.
BL 5.4 Phase 1 In-Progress Review (IPR) #5 first quarter FY19.
BL 5.4 Phase 1 Test Readiness Review (TRR) second quarter FY19.
BL 5.4 Phase 1 Engineering Assessment (EA) third quarter FY19.
BL 5.4 Phase 1 Combat System Certification Panel (CSCP) fourth quarter FY19.
BL 5.4 Phase 2 Kickoff (KO) first quarter FY18.
BL 5.4 Phase 2 System Requirements Review (SRR) second quarter FY19.
BL 5.4 Phase 2 Preliminary Design Review (PDR) second quarter FY20.
BL 5.4 Phase 2 In-Progress Review (IPR) #1 second quarter FY21.
BL 5.4 Phase 2 Test Readiness Review (TRR) first quarter FY22
BL 5.4 Phase 2 Engineering Assessment (EA) second quarter FY22.
BL 5.4 Phase 2 Combat System Certification Panel (CSCP) fourth quarter FY22.

Major Milestones for AEGIS MODE 4/5 Integration:

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

Effort Kickoff first quarter FY18.
Phase I In-Progress Review (IPR) #1 second quarter FY18.
Phase I Code Delivery fourth quarter FY18.
Phase I In-Progress Review (IPR) #2 first quarter FY19.
Phase I BL 6.3 Combat System Certification Panel second quarter FY19
Phase I BL 7.2 Combat System Certification Panel fourth quarter FY19
Phase II In-Progress Review (IPR) #1 third quarter FY18.
Phase II In-Progress Review (IPR) #2 fourth quarter FY19.
Phase III In-Progress Review (IPR) #1 third quarter FY19.
Phase III In-Progress Review (IPR) #2 third quarter FY21.

Major Milestones for Far Term Interoperability Improvement Plan (FTIIP):
Completed Kickoff first quarter FY17.
Completed FTIIP In-Progress Review (IPR) #1 third quarter FY17.
FTIIP In-Progress Review (IPR) #2 fourth quarter FY18.
FTIIP In-Progress Review (IPR) #3 fourth quarter FY19.
FTIIP In-Progress Review (IPR) #4 fourth quarter FY20.

Major Milestones for Task Force Cyber Awakening (TFCA):
Completed In-Progress Review (IPR) #2 second quarter FY17.
Completed In-Progress Review (IPR) #3 fourth quarter FY17.
In-Progress Review (IPR) #4 second quarter FY18.
In-Progress Review (IPR) #5 fourth quarter FY18.
In-Progress Review (IPR) #6 second quarter FY19.
In-Progress Review (IPR) #7 fourth quarter FY19.
In-Progress Review (IPR) #8 second quarter FY20.
In-Progress Review (IPR) #9 fourth quarter FY20.
In-Progress Review (IPR) #10 second quarter FY21.
In-Progress Review (IPR) #11 fourth quarter FY21.
In-Progress Review (IPR) #12 second quarter FY22.

Major Milestones for Combat System Test Bed (CSTB):
Computer Program Delivery #1 second quarter FY19.
Computer Program Delivery #2 second quarter FY20.
Computer Program Accreditation BL 9.2.2 second quarter FY20.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

Computer Program Delivery #3 second quarter FY21.
Computer Program Delivery #4 second quarter FY22.
Computer Program Accreditation BL 9.2 OT third quarter FY22.
Computer Program Delivery #5 second quarter FY23.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604307N / *Surface Combatant Cmbt Sys Eng*	Project (Number/Name) 1447 / *Surf Combatant Combat System Imp*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	C/CPIF	Lockheed Martin : Moorestown, NJ	2,465.801	189.437	Oct 2016	294.322	Oct 2017	283.015	Oct 2018	-		283.015	Continuing	Continuing	Continuing
Systems Engineering	SS/CPFF	APL : Baltimore, MD	91.770	13.892	Oct 2016	16.080	Oct 2017	21.482	Oct 2018	-		21.482	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Dahlgren, VA	445.218	35.247	Oct 2016	36.890	Oct 2017	40.578	Oct 2018	-		40.578	Continuing	Continuing	Continuing
Systems Engineering	SS/CPAF	BAE Systems : Rockville, MD	56.870	5.263	Oct 2016	5.320	Oct 2017	5.521	Oct 2018	-		5.521	Continuing	Continuing	Continuing
Systems Engineering	C/CPIF	Raytheon : St. Petersburg, FL	0.000	0.000		0.000		3.400	Oct 2018	-		3.400	0.000	3.400	-
Systems Engineering	WR	NSWC : Port Hueneme, CA	81.455	7.846	Oct 2016	6.074	Oct 2017	6.578	Oct 2018	-		6.578	Continuing	Continuing	Continuing
Systems Engineering	WR	NWAS : Corona, CA	34.882	3.168	Oct 2016	3.854	Oct 2017	4.082	Oct 2018	-		4.082	Continuing	Continuing	Continuing
Systems Engineering	WR	SPAWAR : San Diego, CA	12.307	0.625	Oct 2016	0.824	Oct 2017	1.089	Oct 2018	-		1.089	Continuing	Continuing	Continuing
Systems Engineering	WR	Various : Various	170.161	10.879	Oct 2016	11.958	Oct 2017	15.524	Oct 2018	-		15.524	Continuing	Continuing	Continuing
Award fees	SS/CPAF	Lockheed Martin : Moorestown, NJ	272.094	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Award fees	SS/CPAF	BAE Systems : Rockville, MD	3.853	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Award fees	SS/CPAF	Alion Science : Washington DC	2.920	0.000		0.000		0.000		-		0.000	0.000	2.920	-
Award fees	WR	Various : Various	9.480	0.261	Oct 2016	0.350	Oct 2017	0.386	Oct 2018	-		0.386	Continuing	Continuing	Continuing
Systems Engineering	C/CPIF	Technology Service Corporation : Silver Spring , MD	0.000	0.000		0.000		0.432	Oct 2018	-		0.432	0.000	0.432	-
		Subtotal	3,646.811	266.618		375.672		382.087		-		382.087	Continuing	Continuing	N/A

Remarks

Various Performing Activities consist of multiple performing activities with funding for each no greater than $1 million per year. These larger performing activities include CDSA Dam Neck and NSWC/Crane.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604307N / *Surface Combatant Cmbt Sys Eng*	Project (Number/Name) 1447 / *Surf Combatant Combat System Imp*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	Department of Interior : Boise, Idaho	42.498	1.281	Oct 2016	0.980	Oct 2017	1.058	Oct 2018	-		1.058	Continuing	Continuing	Continuing
Test and Evaluation	WR	NAVAIR : Pax River, MD	15.350	1.522	Oct 2016	1.350	Oct 2017	1.524	Oct 2018	-		1.524	Continuing	Continuing	Continuing
Test and Evaluation	Various	PMRF : Hawaii, HI	0.000	2.500	Oct 2016	0.900	Oct 2017	0.986	Oct 2018	-		0.986	0.000	4.386	-
		Subtotal	57.848	5.303		3.230		3.568		-		3.568	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	SS/CPAF	Alion Science : Washington DC	30.173	1.264	Oct 2016	1.350	Oct 2017	1.532	Oct 2018	-		1.532	Continuing	Continuing	Continuing
Program Management Support	SS/CPAF	SAIC : Mclean, VA	19.902	2.236	Oct 2016	2.130	Oct 2017	3.270	Oct 2018	-		3.270	Continuing	Continuing	Continuing
DAWDF	Various	Various : Various	1.807	0.000	Oct 2016	0.000	Oct 2017	0.000	Oct 2018	-		0.000	0.000	1.807	-
		Subtotal	51.882	3.500		3.480		4.802		-		4.802	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3,756.541	275.421		382.382		390.457		-		390.457	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

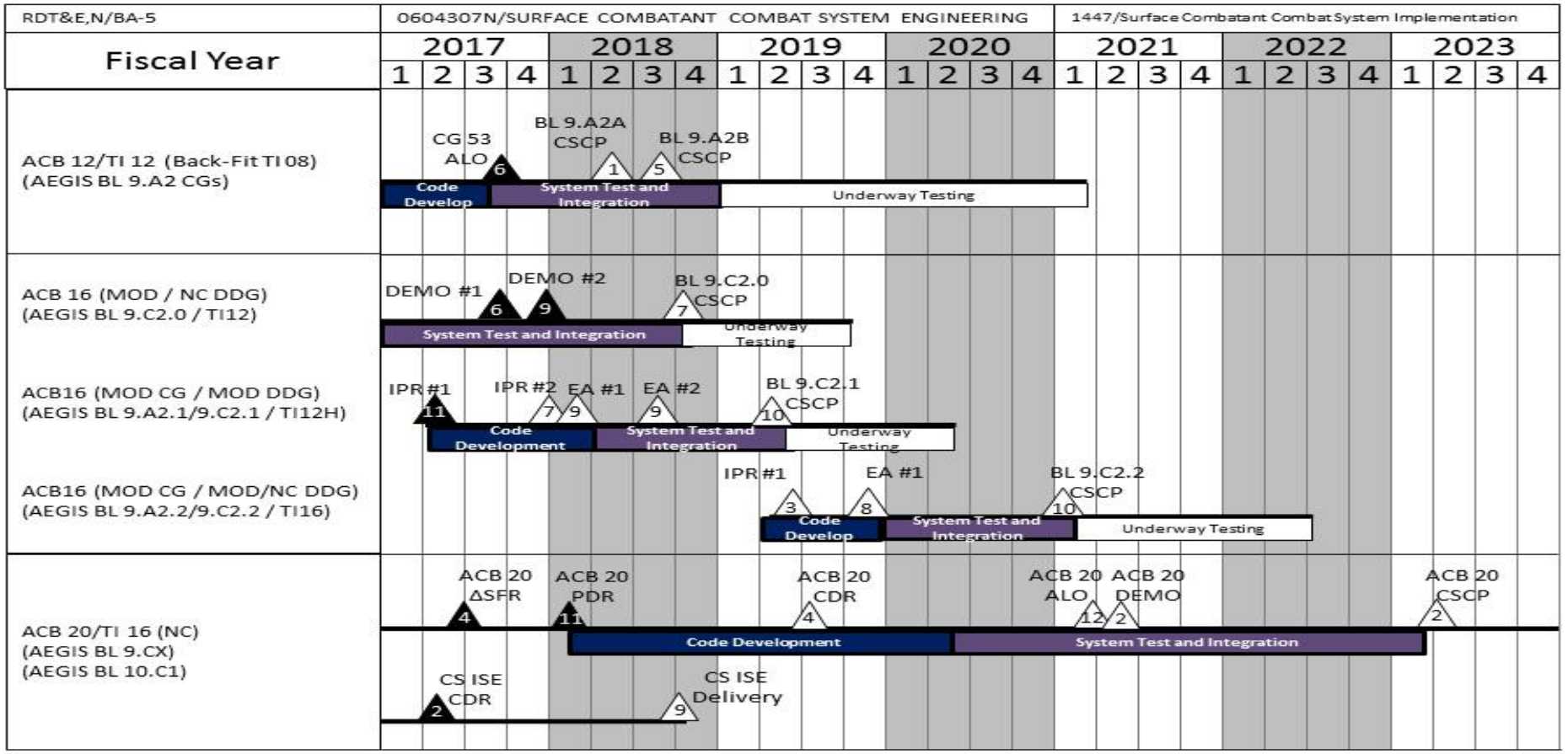


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

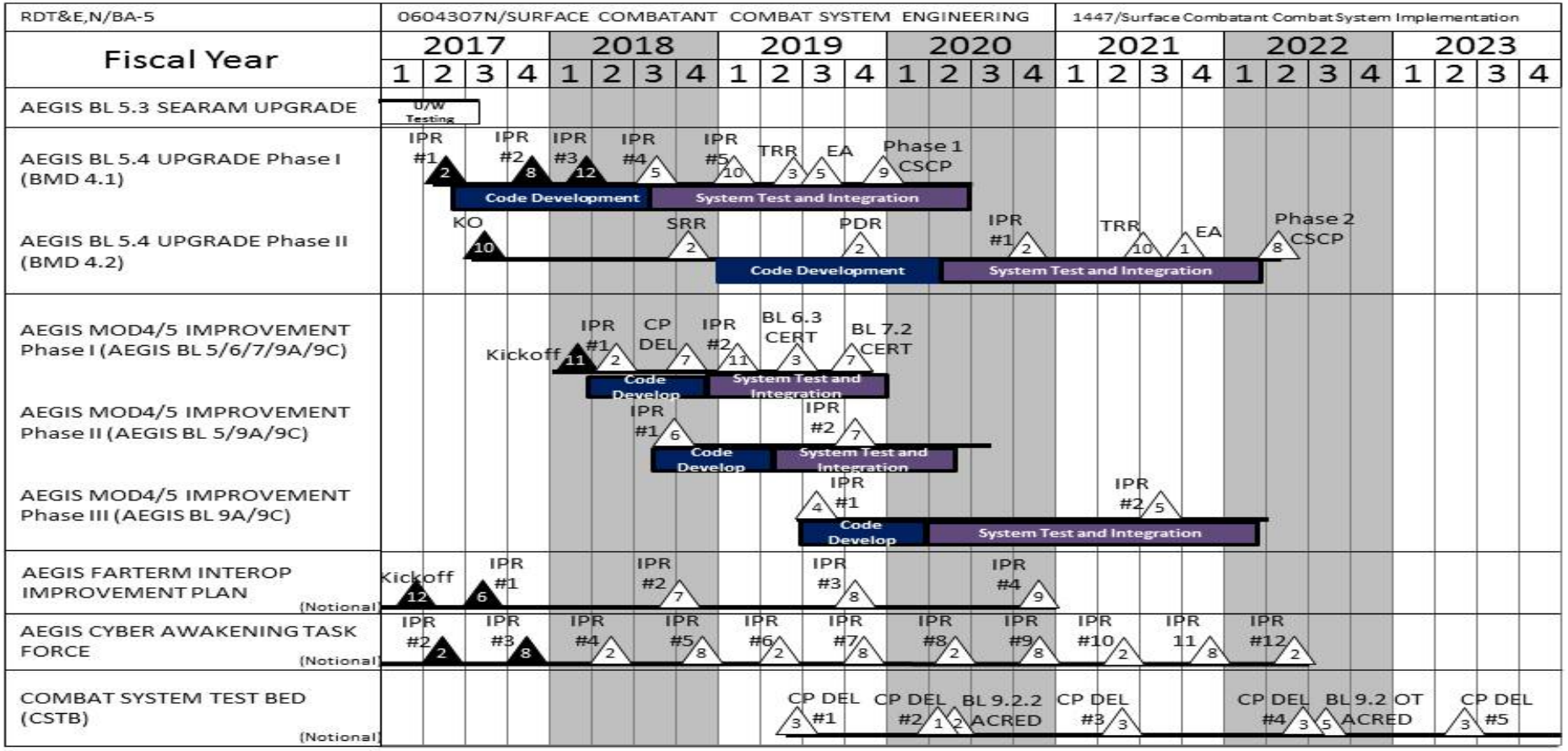


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1447				
ADVANCED CAPABILITY BUILD 12 (BL 9.A2): ACB 12 (BL 9.A2) CG 53 AEGIS LIGHT-OFF	3	2017	3	2017
ADVANCED CAPABILITY BUILD 12 (BL 9.A2): ACB 12 (BL 9.A2) COMPUTER PROGRAM CERTIFICATION PANEL 9.A2.A	2	2018	2	2018
ADVANCED CAPABILITY BUILD 12 (BL 9.A2): ACB 12 (BL 9.A2) COMPUTER PROGRAM CERTIFICATION PANEL 9.A2.B	3	2018	3	2018
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.C2.0) DEMO #1	3	2017	3	2017
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.C2.0) DEMO #2	4	2017	4	2017
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.C2.0) COMBAT SYSTEM CERTIFICATION PANEL (TI12)	4	2018	4	2018
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.A2.1/9.C2.1) IN-PROGRESS REVIEW (IPR) #1	1	2018	1	2018
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.A2.1/9.C2.1) IN-PROGRESS REVIEW (IPR) #2	4	2018	4	2018
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.A2.1/9.C2.1) ENGINEERING ASSESSMENT (EA) #1	4	2018	4	2018
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.A2.1/9.C2.1) ENGINEERING ASSESSMENT (EA) #2	2	2019	2	2019
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.A2.1/9.C2.1) COMBAT SYSTEM CERTIFICATION PANEL (TI12H)	1	2020	1	2020
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.A2.2/9.C2.2) IN-PROGRESS REVIEW (IPR) #1	2	2019	2	2019
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.A2.2/9.C2.2) ENGINEERING ASSESSMENT (EA) #1	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADVANCED CAPABILITY BUILD 16 (BL 9.C2): ACB 16 (BL 9.A2.2/9.C2.2) COMBAT SYSTEM CERTIFICATION PANEL (TI16)	1	2021	1	2021
ADVANCED CAPABILITY BUILD 20: ACB 20 DELTA SYSTEM FUNCTIONAL REVIEW (SFR)	3	2017	3	2017
ADVANCED CAPABILITY BUILD 20: ACB 20 PRELIMINARY DESIGN REVIEW (PDR)	1	2018	1	2018
ADVANCED CAPABILITY BUILD 20: ACB 20 CRITICAL DESIGN REVIEW (CDR)	3	2019	3	2019
ADVANCED CAPABILITY BUILD 20: ACB 20 AEGIS LIGHT OFF (ALO)	1	2021	1	2021
ADVANCED CAPABILITY BUILD 20: ACB 20 DEMONSTRATION	2	2021	2	2021
ADVANCED CAPABILITY BUILD 20: ACB 20 COMBAT SYSTEM CERTIFICATION PANEL (CSCP)	2	2023	2	2023
ADVANCED CAPABILITY BUILD 20: CS ISE CRITICAL DESIGN REVIEW	2	2017	2	2017
ADVANCED CAPABILITY BUILD 20: CS ISE DELIVERY	4	2018	4	2018
COMBAT SYSTEM TEST BED (CTSB): CTSB BUILD #1	2	2019	2	2019
COMBAT SYSTEM TEST BED (CTSB): B/L 9.2.2 ACCREDITATION	2	2020	2	2020
COMBAT SYSTEM TEST BED (CTSB): CTSB BUILD #2	2	2020	2	2020
COMBAT SYSTEM TEST BED (CTSB): CTSB BUILD #3	2	2021	2	2021
COMBAT SYSTEM TEST BED (CTSB): CTSB BUILD #4	2	2022	2	2022
COMBAT SYSTEM TEST BED (CTSB): B/L 9.2 OT ACCREDITATION	3	2022	3	2022
COMBAT SYSTEM TEST BED (CTSB): CTSB BUILD #5	2	2023	2	2023
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 1 IN-PROGRESS REVIEW (IPR) #1	2	2017	2	2017
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 1 IN-PROGRESS REVIEW (IPR) #2	4	2017	4	2017
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 1 IN-PROGRESS REVIEW (IPR) #3	1	2018	1	2018
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 1 IN-PROGRESS REVIEW (IPR) #4	3	2018	3	2018
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 1 IN-PROGRESS REVIEW (IPR) #5	1	2019	1	2019
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 1 TEST READINESS REVIEW (TRR)	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 1 ENGINEERING ASSESSMENT (EA)	3	2019	3	2019
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 1 COMBAT SYSTEM CERTIFICATION PANEL (CSCP)	4	2019	4	2019
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 2 KICK OFF (KO)	1	2018	1	2018
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 2 SYSTEM REQUIREMENTS REVIEW (SRR)	2	2019	2	2019
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 2 PRELIMINARY DESIGN REVIEW (PDR)	2	2020	2	2020
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 2 IN-PROGRESS REVIEW (IPR)	2	2021	2	2021
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 2 TEST READINESS REVIEW (TRR)	1	2022	1	2022
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 2 ENGINEERING ASSESSMENT (EA)	2	2022	2	2022
AEGIS BL 5.4 UPGRADE: AEGIS BL 5.4 PHASE 2 COMBAT SYSTEM CERTIFICATION PANEL (CSCP)	4	2022	4	2022
AEGIS IFF MODE 4/5 Integration: IFF MOD 4/5 Kickoff	1	2018	1	2018
AEGIS IFF MODE 4/5 Integration: PHASE I IN-PROGRESS REVIEW #1	2	2018	2	2018
AEGIS IFF MODE 4/5 Integration: PHASE I COMPUTER PROGRAM DELIVERY	4	2018	4	2018
AEGIS IFF MODE 4/5 Integration: PHASE I IN-PROGRESS REVIEW #2	1	2019	1	2019
AEGIS IFF MODE 4/5 Integration: PHASE I BL 6.3 COMBAT SYSTEM CERTIFICATION PANEL	2	2019	2	2019
AEGIS IFF MODE 4/5 Integration: PHASE I BL 7.2 COMBAT SYSTEM CERTIFICATION PANEL	4	2019	4	2019
AEGIS IFF MODE 4/5 Integration: PHASE II IN-PROGRESS REVIEW #1	3	2018	3	2018
AEGIS IFF MODE 4/5 Integration: PHASE II IN-PROGRESS REVIEW #2	4	2019	4	2019
AEGIS IFF MODE 4/5 Integration: PHASE III IN-PROGRESS REVIEW #1	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 1447 / *Surf Combatant Combat System Imp*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AEGIS IFF MODE 4/5 Integration: PHASE III IN-PROGRESS REVIEW #2	3	2021	3	2021
FAR TERM INTEROPERABILITY IMPROVEMENTS PLAN: FTIIP KICKOFF	1	2017	1	2017
FAR TERM INTEROPERABILITY IMPROVEMENTS PLAN: FTIIP IN-PROGRESS REVIEW #1	3	2017	3	2017
FAR TERM INTEROPERABILITY IMPROVEMENTS PLAN: FTIIP IN-PROGRESS REVIEW #2	4	2018	4	2018
FAR TERM INTEROPERABILITY IMPROVEMENTS PLAN: FTIIP IN-PROGRESS REVIEW #3	4	2019	4	2019
FAR TERM INTEROPERABILITY IMPROVEMENTS PLAN: FTIIP IN-PROGRESS REVIEW #4	4	2020	4	2020
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #2	2	2017	2	2017
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #3	4	2017	4	2017
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #4	2	2018	2	2018
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #5	4	2018	4	2018
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #6	2	2019	2	2019
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #7	4	2019	4	2019
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #8	2	2020	2	2020
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #9	4	2020	4	2020
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #10	2	2021	2	2021
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #11	4	2021	4	2021
TASK FORCE CYBER AWAKENING (TFCA): TFCA IN-PROGRESS REVIEW #12	2	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604307N / *Surface Combatant Cmbt Sys Eng*	Project (Number/Name) 3357 / *Aegis Training Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3357: *Aegis Training Improvement Program*	27.124	10.355	7.856	6.946	-	6.946	7.863	7.766	6.404	5.474	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AEGIS Training Improvement project provides enhancements and upgrades to the Total Ship Training Capability (TSTC) training components within the combat system to address needs for increased training capability and functionality in conjunction with AEGIS Advanced Capability Builds (ACB). These enhancements will address current and future training requirements by implementing new functionality to enable the individual warfighter through distributed battle group events to engage in more complex training requirements to support fleet required training certification events. Capability Development and integration are related to Integrated Air and Missile Defense, Underwater, Surface, and other warfare areas. Capability enhancements and upgrades include development of re-useable common components that can be leveraged by SSDS MK2 combat systems, and/or integration of re-usable common components developed by the TSTC Battle Force Tactical Trainer (BFTT) Program and Ship Self Defense System (SSDS) MK2 TSTC Training Improvement programs to meet AEGIS combat system training requirements. TSTC provides realistic joint warfare training across the spectrum of armed conflict, realistic unit level team training in all warfare areas (e.g. NIFC-CA and BMD missions to support IAMD). TSTC provides ships' Commanding Officers and Battle Group/Battle Force Commanders with the ability to conduct coordinated realistic, high stress, combat system level team training as an integral part of the Afloat Training Organization, the Tactical Training Groups and C2F/C3F Fleet Synthetic Trainers (FSTs). TSTC continues to integrate and update, as new tactical capabilities are being introduced, to enable crew operator proficiency training for basic and sustainment level training events, through distributed strike group certification fleet synthetic training (FST) events and including COMPTUEX FST at Sea integration into Live, Virtual and Constructive (LVC) environment. Continued Development is required to integrate new capabilities and interfaces to provide training for AEGIS and SSDS combat system capability upgrades, and to address the Fleet's Live, Virtual and Constructive (LVC) Fleet Training Wholeness initiative. Additionally, modernization is needed to support the DoD Training Transformation Plan, the Chief of Naval Operations Fleet Response Plan and Commander United States Fleet Forces Command Fleet Readiness Training Plan.

The Advanced Training Domain (ATD) is being developed to combine BFTT and the AEGIS Combat Training System (ACTS) into a common system that integrates with AEGIS BL 9.2.2AF, and SSDS BL 11.xAF. ATD is being hosted along with the AEGIS and SSDS combat system on TI-16 common processing and display hardware. ATD is being designed to be the core of the Total Ship Training Capability, and is projected to be more reliable, simpler to use, and architected to be extensible to meet interoperability and capability enhancement challenges in the future.

The BFTT is being updated to maintain integration and capability enhancements developed for the Cooperative Engagement Capability (CEC), Surface Electronic Warfare Improvement Program (SEWIP), and the Carrier Tactical Support Center (CV-TSC), and SSDS Fire Control Loop Improvement Program.

TSTC provides realistic joint warfare training across the spectrum of armed conflict, realistic unit level team training in all warfare areas (e.g. NIFC-CA and BMD missions to support IAMD). TSTC provides ships' Commanding Officers and Battle Group/Battle Force Commanders with the ability to conduct coordinated realistic, high stress, combat system level team training as an integral part of the Afloat Training Organization, the Tactical Training Groups and C2F/C3F FST/LVC events.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 3357 / *Aegis Training Improvement Program*

Develop and integrate MH-60R simulator to enable embedded shipboard training in support of basic and sustainment training, as well as establishes the pathway to support pier-side Fleet Synthetic Training (FST) events.

Develop and Integrate Cooperative Engagement Capability (CEC) Enhanced Training (CET) to support basic and sustainment level training, as well as provide ability to distribute and establish CEC data link during pier-side fleet synthetic training exercises. CET will also provide enable proficiency training of NIFC-CA capability.

Develop and integrate CEC Interim Training (CIT) capability to support pier-side fleet synthetic training events. This is an interim capability support the distributed portion of the CET capability, until CET is fully deployed. This supports training of strike groups of new tactical capabilities that were integrated into the AEGIS BL9 ships, and provides the necessary functionality to allow ships to train as a strike group.

Develop and integrate upgrades to Battle-Force Electronic Warfare Trainer (BEWT) to support soft kill training with NULKA.

Develop Identification Friend or Foe (IFF) simulator to enable training of Modes 1, 2, 3A, 4, C, 5 and S on both AEGIS and SSDS ships. Capability will support AEGIS and SSDS IFF MODE 4/5 Integration program will address training Mode 4 Inoculation, and allow training of Modes 5 and S IFF.

Develop and integrate commensurate training improvements to SSDS ACB 20 for Enhanced Sea Sparrow Missile (ESSM) and Electronic Warfare (EW) tactical improvements.

Integrate Navy Continuous Training Environment (NCTE) networking and cyber security upgrades maintain authorization to participate in distributed shipboard training events.

TSTC integrated on AEGIS provides the capability to complete system and operational level testing of the combat system.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AEGIS Training Improvement and ACB 16 Integration	10.355	7.856	5.644	0.000	5.644
Articles:	-	-	-	-	-
Description: AEGIS Total Ship Training Capability (TSTC) provides enhancements to training components and increase training functionality in conjunction with AEGIS ACB16 development and integration. These enhancements will address current and future training requirements and implement new functionality to support more complex training requirements related to Underwater, Surface and other warfighter upgrades.					
FY 2018 Plans: BFTT 5.1.1: Complete and certify for delivery and integration on BL 9.2.1.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 3357 / *Aegis Training Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct combat systems integration and certification testing for Simulated NULKA Soft-Kill training capability, for within AN/SLQ-32(V)6 Surface Electronic Warfare Team Trainer (SEWTT), and Battle-Force Electronic warfare Trainer (BEWT) in support of legacy AN/SLQ-32A/B systems. Conduct ATD 1.0 Test and Evaluation in support of AEGIS ACB 16 phase 2 and SSDS ACB 12+ TI-16 based combat systems. Deliver CEC Embedded Training capability, IFF Simulator, NULKA Simulator, and MH-60R Simulator for integration and testing. Develop tactical representative training improvements to SSDS ACB 20 by developing Own-Ship Weapon Simulation based on ESSM BLK 2 models, and implement Electronic Warfare Training improvements for Electronic Attack and Advanced Off-board Electronic Warfare (AOEW). ***FY 2019 Base Plans:*** AEGIS Modifications to support integration and testing of ATD and BFTT Integrated Training Improvements. ATD 1.0: Deliver ATD 1.0 to support AEGIS BL 9.2.2 and SSDS BL 11.x ATD 1.1: Conduct integration testing with AEGIS BL 10.x BFTT 5.1.2: Deliver training capability to support SSDS Combat System FCLIP upgrades. ATD and BFTT: Continue to achieve interoperability with NCTE, AEGIS and SSDS Combat Systems; SLQ-32, SQQ-89, CV-TSC, SPQ-9B AMDR, EASR, and CEC PARM Elements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to rate changes.					
Title: Fleet Training Wholeness	0.000	0.000	1.302	0.000	1.302
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 3357 / *Aegis Training Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Develop ECP's to implement ability for SPS-48 and SPQ-9B radars to process both simulated and live contacts. Develop changes on AEGIS and SSDS baselines to allow training to overlay tactical displays to support training underway. Develop of Surface Warfare Capability for integration on AEGIS. Develop Cooperative Engagement Capability (CEC) Distributed Training Capability enhancements for training underway. Assess safety and navigation distribution for underway training. Develop data collection and after-action review tools for large events. Develop surface search radar simulators. Integrate shipboard synthetic tactical radios. Develop weapon systems modifications to integrate LVC functionality and safety. Initiate ATD 2.x and BFTT 5.2.x development efforts to integrate above capabilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increased funding provided to address training deficiencies within the AEGIS Combat System and associated Weapons Systems.					
Accomplishments/Planned Programs Subtotals	10.355	7.856	6.946	0.000	6.946

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 3357 / *Aegis Training Improvement Program*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE/0204571N/1427: *Surface Tactical Team Trainer (STTT)*	12.148	15.274	34.187	-	34.187	42.554	34.241	24.353	17.876	Continuing	Continuing

Remarks

D. Acquisition Strategy

Efforts will be completed on various contracts to support requirements updates to multiple products that will support Training Integration and Implementation within AEGIS ACB16.

E. Performance Metrics

Training Improvement Program efforts will complete major development milestones.
Major Milestones for ACB 16 (BL 9.A2/B2/C2):
Completed ACB16 BL 9.C2.0 Demonstration #1 third quarter FY17.
ACB16 BL 9.C2.0 Demonstration #2 fourth quarter FY17.
ACB16 BL 9.C2.0 Combat System Certification Panel (CSCP) TI12 Configuration fourth quarter FY18.
ACB16 BL 9.A2.1/C2.1 In-Progress Review (IPR) #1 first quarter FY18.
ACB16 BL 9.A2.1/C2.1 In-Progress Review (IPR) #2 fourth quarter FY18.
ACB16 BL 9.A2.1/C2.1 Engineering Assessment (EA) #1 fourth quarter FY18.
ACB16 BL 9.A2.1/C2.1 Engineering Assessment (EA) #2 second quarter FY19.
ACB16 BL 9.A2.1 / 9.C2.1 Combat System Certification Panel (CSCP) TI12H Configuration first quarter FY20.
ACB16 BL 9.A2.2 / 9.C2.2 In-Progress Review (IPR) #1 second quarter FY19.
ACB16 BL 9.A2.2 / 9.C2.2 Engineering Assessment (EA) #1 fourth quarter FY19
ACB16 BL 9.A2.2 / 9.C2.2 Combat System Certification Panel (CSCP) TI16 Configuration first quarter FY21.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604307N / *Surface Combatant Cmbt Sys Eng*	Project (Number/Name) 3357 / *Aegis Training Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Various	Various : Various	14.186	4.776	Dec 2016	4.178	Dec 2017	3.696	Dec 2018	-		3.696	Continuing	Continuing	Continuing
		Subtotal	14.186	4.776		4.178		3.696		-		3.696	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	Various	Various : Various	11.441	4.979	Dec 2016	3.050	Dec 2017	2.592	Dec 2018	-		2.592	Continuing	Continuing	Continuing
		Subtotal	11.441	4.979		3.050		2.592		-		2.592	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	C/CPIF	CACI : Arlington, VA	1.066	0.500	Dec 2016	0.527	Dec 2017	0.553	Dec 2018	-		0.553	Continuing	Continuing	Continuing
Professional Support	C/CPIF	TMB : Washington DC	0.431	0.100	Dec 2016	0.101	Dec 2017	0.105	Dec 2018	-		0.105	Continuing	Continuing	Continuing
		Subtotal	1.497	0.600		0.628		0.658		-		0.658	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	27.124	10.355		7.856		6.946		-		6.946	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 3357 / *Aegis Training Improvement Program*

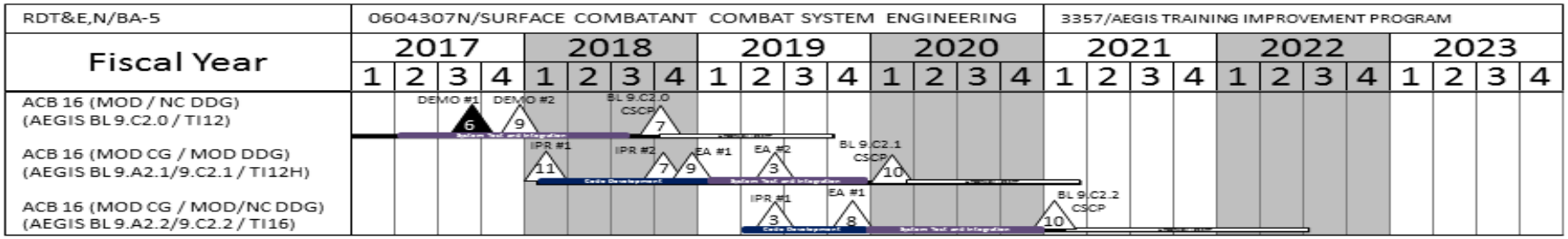


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 3357 / *Aegis Training Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3357				
ACB16 BL 9.C2: ACB 16 (BL 9.C2.0) DEMO #1	3	2017	3	2017
ACB16 BL 9.C2: ACB 16 (BL 9.C2.0) DEMO #2	4	2017	4	2017
ACB16 BL 9.C2: ACB 16 (BL 9.C2.0) COMBAT SYSTEM CERTIFICATION PANEL (TI12)	4	2018	4	2018
ACB16 BL 9.C2: ACB 16 (BL 9.C2.1) IN-PROGRESS REVIEW (IPR) #1	1	2018	1	2018
ACB16 BL 9.C2: ACB 16 (BL 9.C2.1) IN-PROGRESS REVIEW (IPR) #2	4	2018	4	2018
ACB16 BL 9.C2: ACB 16 (BL 9.C2.1) ENGINEERING ASSESSMENT #1	4	2018	4	2018
ACB16 BL 9.C2: ACB 16 (BL 9.C2.1) ENGINEERING ASSESSMENT #2	2	2019	2	2019
ACB16 BL 9.C2: ACB 16 (BL 9.C2.1) COMBAT SYSTEM CERTIFICATION PANEL (TI12H)	1	2020	1	2020
ACB16 BL 9.C2: ACB 16 (BL 9.C2.2) IN-PROGRESS REVIEW (IPR) #1	2	2019	2	2019
ACB16 BL 9.C2: ACB 16 (BL 9.C2.2) ENGINEERING ASSESSMENT #1	4	2019	4	2019
ACB16 BL 9.C2: ACB 16 (BL 9.C2.2) COMBAT SYSTEM CERTIFICATION PANEL (TI126	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604307N / *Surface Combatant Cmbt Sys Eng*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	2.902	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.902
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Support the implementation of Condition Based Maintenance (CBM) improvements on the ADEPT tool specific to the Fire Control System (FCS) MK-99 System. These improvements are targeted to improve the operational availability of the FCS system fielded on AEGIS CG's and DDG's.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Small Business Technology Insertion	2.902	0.000
FY 2017 Accomplishments: N/A		
FY 2018 Plans: N/A		
Congressional Adds Subtotals	2.902	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

IDIQ Contract through NSWC PH.

E. Performance Metrics

Pilot Implementation - SEPT 2017

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604307N / *Surface Combatant Cmbt Sys Eng*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mikros System Corp	C/IDIQ	NSWC PH : Port Hunemee, CA.	0.000	2.802	Aug 2017	0.000		0.000		-		0.000	0.000	2.802	-
		Subtotal	0.000	2.802		0.000		0.000		-		0.000	0.000	2.802	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PSS Support	C/FFP	TMB : Washington, DC.	0.000	0.100	Sep 2017	0.000		0.000		-		0.000	0.000	0.100	-
		Subtotal	0.000	0.100		0.000		0.000		-		0.000	0.000	0.100	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	2.902		0.000		0.000		-		0.000	0.000	2.902	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 9999 / *Congressional Adds*

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
ADSSS Upgrade: Pilot Program				■																								

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604307N / *Surface Combatant Cmbt Sys Eng*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
ADDSS Upgrade: Pilot Program	4	2017	4	2017

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604311N *I LPD-17 Class Systems Integration*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	33.536	0.565	0.689	0.939	-	0.939	0.863	0.811	0.827	0.844	Continuing	Continuing
2283: *LPD-17 Class System Integration*	33.536	0.565	0.689	0.939	-	0.939	0.863	0.811	0.827	0.844	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $0.018 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

The LPD 17 Class ships are functional replacements for 41 ships of four classes of amphibious ships. These new ships embark, transport, and land elements of Marine landing forces in an assault by helicopters, landing craft, and amphibious vehicles. Tactics, techniques, and tools for naval expeditionary warfare continue to evolve. The LPD 17 Class configuration must continue to adapt to this evolutionary process, because these ships are expected to be in service until almost 2050. The LPD 17 design includes system configurations that reduce operating and support costs and facilitate operational performance improvements. System engineering and integration efforts that began in FY97 will develop further reductions in life cycle costs and will integrate performance upgrades in a rapid, affordable manner. Possible research and development investigations include improvements in Hull, Mechanical and Electrical systems, advanced sensors, advanced computers, advanced command and control software, advanced information system technologies, and ship based logistics support. Cost reduction and improved performance will be accomplished through sustained modeling and simulation efforts, resolutions of equipment obsolescence issues, prototype development, continued personnel reduction efforts, system performance tradeoff evaluations, and naval expeditionary warfare system engineering. Feedback from the Fleet for integrating system configurations will be accomplished through Naval Surface Warfare Centers (Philadelphia, Dahlgren, Port Hueneme, Panama City). These efforts will result in well defined specifications and drawings in system in system integration design packages that provide technical baseline for follow on ship procurements.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.580	0.689	0.968	-	0.968
Current President's Budget	0.565	0.689	0.939	-	0.939
Total Adjustments	-0.015	0.000	-0.029	-	-0.029
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.015	0.000			
• Program Adjustments	0.000	0.000	-0.018	-	-0.018
• Rate/Misc Adjustments	0.000	0.000	-0.011	-	-0.011

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604311N / *LPD-17 Class Systems Integration*	Project (Number/Name) 2283 / *LPD-17 Class System Integration*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2283: *LPD-17 Class System Integration*	33.536	0.565	0.689	0.939	-	0.939	0.863	0.811	0.827	0.844	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The LPD 17 Class ships are functional replacements for 41 ships of four classes of amphibious ships. These new ships embark, transport, and land elements of Marine landing forces in an assault by helicopters, landing craft, and amphibious vehicles. Tactics, techniques, and tools for naval expeditionary warfare continue to evolve. The LPD 17 Class configuration must continue to adapt to this evolutionary process, because these ships are expected to be in service until almost 2050. The LPD 17 design includes system configurations that reduce operating and support costs and facilitate operational performance improvements. System engineering and integration efforts that began in FY97 will develop further reductions in life cycle costs and will integrate performance upgrades in a rapid, affordable manner. Possible research and development investigations include improvements in Hull, Mechanical and Electrical systems, advanced sensors, advanced computers, advanced command and control software, advanced information system technologies, and ship based logistics support. Cost reduction and improved performance will be accomplished through sustained modeling and simulation efforts, resolutions of equipment obsolescence issues, prototype development, continued personnel reduction efforts, system performance tradeoff evaluations, and naval expeditionary warfare system engineering. Feedback from the Fleet for integrating system configurations will be accomplished through Naval Surface Warfare Centers (Philadelphia, Dahlgren, Port Hueneme, Panama City). These efforts will result in well defined specifications and drawings in system in system integration design packages that provide technical baseline for follow on ship procurements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Systems Engineering/Integration	0.565	0.689	0.939	0.000	0.939
Articles:	-	-	-	-	-
Description: Continued Naval Expeditionary Warfare Systems Engineering efforts and integration efforts for unique LPD 17 Class systems, including efforts to resolve obsolescence issues impacting the class.					
FY 2018 Plans: - Initiate USMC Weapons Stowage studies. - Studies to be conducted by HII and system vendors, with review and acceptance through the Naval Surface Warfare Centers. Leverage LXR designs where possible for potential obsolescence backfit solutions on the LPD 17 class. - Complete MPDE Lube Oil Un-loader Valve Testing & Design solutions. - Continue development of Fiber Optic Cable Plant Monitoring System under SBIR Phase II and transition to Phase III.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604311N / *LPD-17 Class Systems Integration*	**Project (Number/Name)** 2283 / *LPD-17 Class System Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue SSDG Lube Oil & Fuel Oil Filter class design improvement studies. - Continue shipboard studies for LPD 28 HM&E obsolescence and new commercial systems. Develop design, qualification, and testing projects to evaluate: expanded use of commercial systems for cost savings; and machinery/engineering control system integration with new systems and networks; MPDE Exhaust duct temperature studies and structural analysts for class improvements. - Complete Knuckleboom Crane LMI sensor redesign. - Conduct Environmental Qualification Testing for new systems installed on LPD 28. ***FY 2019 Base Plans:*** - Continue to conduct Environmental Qualification Testing for new systems installed on LPD 28 such as, commercial motors, pumps and tankless water heaters. - Complete USMC weapons stowage studies, and complete engineering design drawings. - Continue SBIR projects for LPD 17 Class Ships. Initiate Phase I projects and transition to Phase II or III. - Complete SSDG Lube Oil & Fuel Oil Filter class designs. - Complete Fiber Optic Cable Plat monitoring system via SBIR Phase III acquisition. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.250 million from FY 2018 to FY 2019 supports the Environmental Qualification Testing for new systems on the LPD 28.					
Accomplishments/Planned Programs Subtotals	0.565	0.689	0.939	0.000	0.939

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/3036: *LPD-17*	1,831.060	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21,322.133

Remarks

D. Acquisition Strategy

FY17 and out: continue developmental sole source efforts, improve quality and cost savings engineering studies.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604311N / *LPD-17 Class Systems Integration*	**Project (Number/Name)** 2283 / *LPD-17 Class System Integration*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604311N / *LPD-17 Class Systems Integration*	**Project (Number/Name)** 2283 / *LPD-17 Class System Integration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Integration	WR	NSWC Crane : Crane, IN	13.236	0.000		0.000		0.000		-		0.000	0.000	13.236	-
Systems Engineering and Integration	C/CPFF	Raytheon Comp : San Diego, CA	2.432	0.000		0.000		0.000		-		0.000	0.000	2.432	-
LSD(X) Systems Integration (Next Gen.)	C/CPFF	CSC, Alion Science : Washington, DC	0.549	0.000		0.000		0.000		-		0.000	0.000	0.549	-
LSD(X) Systems Integration (Next Gen.)	WR	NSWC Carderock, NSWC Dahlgren : NSWC Beth, MD; NSWC Dahlgren, VA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
DAWF	Various	Various : Various	0.005	0.000		0.000		0.000		-		0.000	0.000	0.005	-
Systems Engineering and Integration	C/CPFF	Huntington Ingalls Industries : Pascagoula, MS	0.557	0.430	Dec 2016	0.539	Dec 2017	0.889	Dec 2018	-		0.889	Continuing	Continuing	Continuing
Systems Engineering and Integration	WR	NSWC, Philadelphia : Philadelphia, PA	1.015	0.000		0.000		0.000		-		0.000	0.000	1.015	-
Systems Engineering and Integration	WR	NSWC, Port Hueneme : Port Hueneme, CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Systems Engineering and Integration	C/CPFF	ULTRA Communications : Vista, CA	0.150	0.135	Jul 2017	0.150	Nov 2017	0.050	Nov 2018	-		0.050	Continuing	Continuing	Continuing
		Subtotal	18.044	0.565		0.689		0.939		-		0.939	Continuing	Continuing	N/A

Remarks

FY2018 key events include Initiating shipboard studies for LPD 28 HM&E obsolescence and new commercial systems. Developing design, qualification, and testing projects to evaluate Ship Service Diesel Generator (SSDG) Lube Oil & Fuel Oil Filter, Knuckleboom Crane LMI, MPDE Lube Oil Unloader, MPDE Barring Meter: structural changes for Boat Valley/Replenishment At Sea (RAS) - Fueling At Sea (FAS)/and Troop Berthing; Investigate small business and commercial systems for cost savings.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604311N / *LPD-17 Class Systems Integration*	**Project (Number/Name)** 2283 / *LPD-17 Class System Integration*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OT&E/Interoperability	WR	OPTEVFOR : Norfolk, VA	15.492	0.000		0.000		0.000		-		0.000	0.000	15.492	-
		Subtotal	15.492	0.000		0.000		0.000		-		0.000	0.000	15.492	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	33.536	0.565		0.689		0.939		-		0.939	Continuing	Continuing	N/A

Remarks

The funds for FY 18 are in support of the continuation of the development of Fiber Optic Cable Plant Monitoring System and the continuation of the development of SSDG Lube Oil & Fuel Oil Filters, MPDE Lube Oil Un-loader design, and USMC Weapons Storage & Armory improvements. The FY19 funds are in support of conducting Environmental Qualification testing for new systems installed on LPD 28; completing USMC weapons stowage studies, engineering design drawings, SSDG Lube Oil & Fuel Oil Filter class design, and Fiber Optic Cable Plant monitoring system via SBIR Phase III acquisition; continuing SBIR projects for LPD 17 Class Ships; and initiating Phase I projects and transition to Phase II or III.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604311N / *LPD-17 Class Systems Integration*	**Project (Number/Name)** 2283 / *LPD-17 Class System Integration*

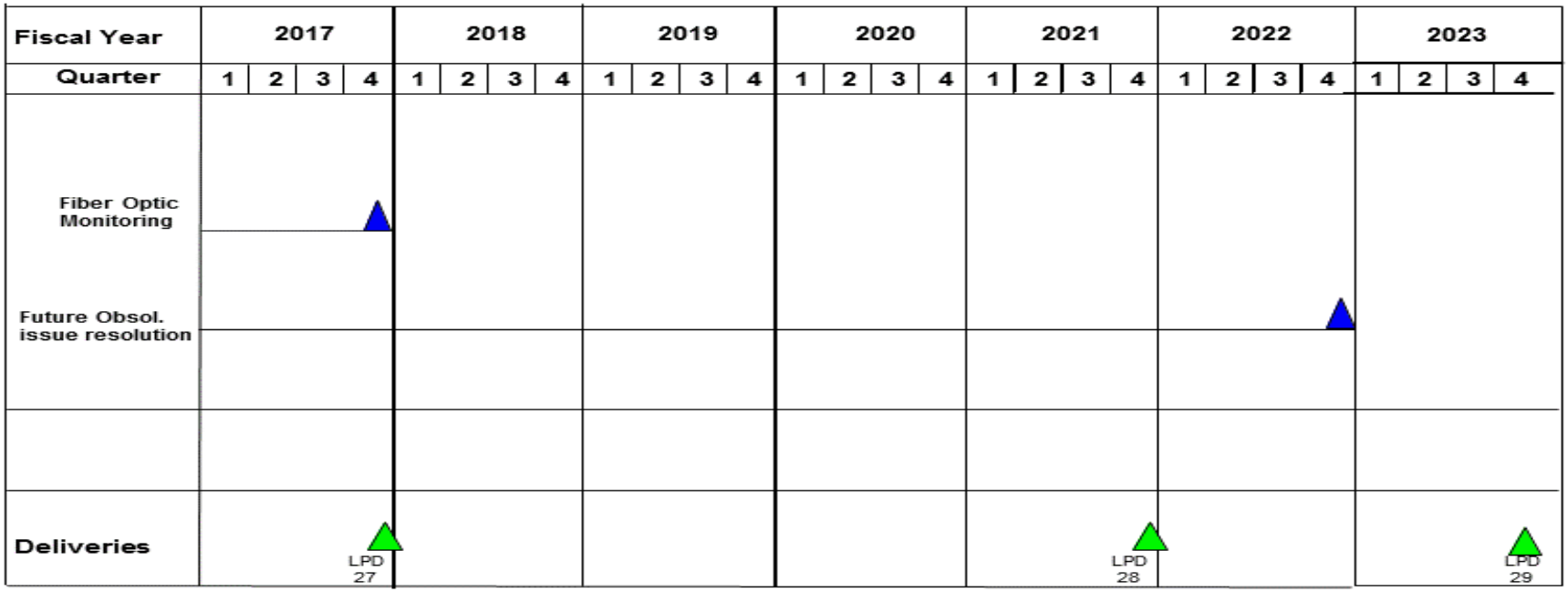


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604311N / *LPD-17 Class Systems Integration*	**Project (Number/Name)** 2283 / *LPD-17 Class System Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2283				
Delivery (LPD 27)	4	2018	4	2018
Fiber Optic Monitoring	1	2017	1	2018
Future Obsol. Issue Resolution	1	2017	4	2022
Delivery (LPD 28)	4	2021	4	2021
Delivery (LPD 29)	4	2023	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604329N *I Small Diameter Bomb (SDB)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	277.567	86.989	112.846	104.448	-	104.448	81.359	64.899	47.541	48.569	Continuing	Continuing
1663: *SDB II F-18 Integration*	53.016	45.356	50.546	31.875	-	31.875	7.812	5.985	3.132	3.209	Continuing	Continuing
3072: *Small Diameter Bomb (SDB)*	182.397	34.434	57.637	72.573	-	72.573	73.547	58.914	44.409	45.360	Continuing	Continuing
3082: *JMM BRU*	42.154	7.199	4.663	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	54.016
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 439												

A. Mission Description and Budget Item Justification

Small Diameter Bomb Increment II (SDB II) is an ACAT 1C joint Department of the Air Force (USAF) and Department of the Navy (DON), with the USAF as the lead service. SDB II provides the warfighter with the capability to attack mobile targets in all-weather from Stand-Off range. SDB II addresses the following warfighter requirements: attack mobile targets, adverse weather operations, multiple kills per pass, multiple ordnance carriage, precision munitions capability, capability against fixed targets, reduced munitions footprint, increased weapons effectiveness, minimized potential for collateral damage, reduced susceptibility of munitions to countermeasures, and provides a net-centric operations capability. The threshold aircraft for the USAF is the F-15E and for the DON are the F-35B and F-35C.

The DON has adjusted the platform integration strategy through the inclusion of F/A-18 E/F using BRU-55 to deliver the capability to the warfighter aligned to adjusted F-35 program's schedule.

JMM BRU contract with Raytheon Intelligence Information Systems (RIIS, formerly RTSC) was terminated for convenience 19 October 2017. FY 2018 funds remain in PU 3082 to pay contract termination costs. FY 2019 and beyond funding was transferred from PU 3082 to PU 3072 to pay for mods to the current BRU-61 to meet Navy and Marine Corps environments.

BUDGET ACTIVITY JUSTIFICATION: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604329N *I Small Diameter Bomb (SDB)*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	97.622	112.846	110.575	-	110.575
Current President's Budget	86.989	112.846	104.448	-	104.448
Total Adjustments	-10.633	0.000	-6.127	-	-6.127
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.000	0.000			
• SBIR/STTR Transfer	-2.633	0.000			
• Rate/Misc Adjustments	0.000	0.000	-6.127	-	-6.127
• Congressional Directed Reductions Adjustments	-6.000	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by $4.800 million to account for the availability of prior year execution balances.

The remainder of the FY 2019 rate/miscellaneous adjustments were for purchase price inflation and other rate changes for the programs.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604329N / *Small Diameter Bomb (SDB)*	Project (Number/Name) 1663 / *SDB II F-18 Integration*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1663: *SDB II F-18 Integration*	53.016	45.356	50.546	31.875	-	31.875	7.812	5.985	3.132	3.209	Continuing	Continuing
Quantity of RDT&E Articles	29	24	40	18	-	18	-	-	-	-		

A. Mission Description and Budget Item Justification

Due to continuing delays in the F-35 program, the DON has adjusted the platform integration strategy by inclusion of Small Diameter Bomb II (SDB II) and BRU-55 on F/A-18 E/F to deliver the capability to the warfighter in light of continued F-35 program delays. This program funds the aircraft software, integration, and testing required to successfully integrate SDB II and BRU-55 on the F/A-18 E/F to meet a FY 2020 Initial Operational Capability (IOC).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: F/A-18 Integration	45.356	50.546	31.875	0.000	31.875
Articles:	24	40	18	-	18
FY 2018 Plans: Complete ground testing, continue Development Test (DT) efforts, and complete OFP software coding, including UAI. Contract with SDB Prime contractor for 30 SDB Guided Test Vehicles (GTVs), and 10 SDB Captive Carriage Reliability Test (CCRTs) for flight testing.					
FY 2019 Base Plans: Complete DT efforts for both weapon system and aircraft OFP. Contract with SDB Prime contractor for 15 SDB JTVs and 3 All Up Rounds (AUR) to support Operational Test which will begin in FY20.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The decrease from FY 2018 to FY 2019 reflects the completion of the F-18 Operational Flight Plan (OFP) software coding. Developmental Testing will continue in FY 2019.					
Accomplishments/Planned Programs Subtotals	45.356	50.546	31.875	0.000	31.875

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 1663 / *SDB II F-18 Integration*

D. Acquisition Strategy

Integration of SDB II and the BRU-55 is software driven by ground and flight test requirements.

E. Performance Metrics

Earned value will be used for the contracted efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 1663 / *SDB II F-18 Integration*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OFP Development and Support	SS/IDIQ	Boeing : St. Louis, MO	19.334	18.900	Nov 2016	13.569	Jan 2018	6.901	Nov 2018	-		6.901	1.619	60.323	60.323
SDB II Prime Contractor Support	SS/IDIQ	Raytheon Missile Systems : Tuscon, AZ	6.607	11.922	Aug 2017	18.404	May 2018	7.624	Feb 2019	-		7.624	15.435	59.992	59.992
JMM BRU Prime Contractor Support	SS/IDIQ	Raytheon Intelligence Information Systems, Inc. : Indianapolis, IN	6.665	2.000	May 2017	0.000	May 2018	0.000		-		0.000	0.000	8.665	8.665
SDB II Integration Support	WR	NAWC AD : Patuxent River, MD	4.200	2.817	Nov 2016	2.855	Nov 2017	2.023	Nov 2018	-		2.023	Continuing	Continuing	Continuing
SDB II Software Support	WR	NAWC WD : China Lake, CA	4.724	7.717	Nov 2016	2.844	Nov 2017	2.266	Nov 2018	-		2.266	Continuing	Continuing	Continuing
		Subtotal	41.530	43.356		37.672		18.814		-		18.814	Continuing	Continuing	N/A

Remarks

Funding for Boeing includes software coding of Operational Flight Program Build, to include Universal Armament Interface (UAI) and F/A-18 E/F aircraft support required to meet the FY 2020 Initial Operating Capability (IOC).

Funding for SDB II (Raytheon Missile Systems) Prime Contractor includes support of Super Hornet Integration efforts.

Contract with Raytheon Intelligence Information Systems (RIIS) terminated for convenience 19 October 2017.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Wind Tunnel Test	MIPR	AEDC : Arnold AFB, TN	6.200	0.000		0.000		0.000		-		0.000	0.000	6.200	-
Wind Tunnel Test	MIPR	NASA Ames : Moffett Field, CA	0.878	0.000		0.000		0.000		-		0.000	0.000	0.878	-
Development Test	WR	VX-23 : Patuxent River, MD	4.408	2.000	Jan 2017	12.874	Jan 2018	6.597	Nov 2018	-		6.597	4.903	30.782	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604329N / *Small Diameter Bomb (SDB)*	Project (Number/Name) 1663 / *SDB II F-18 Integration*	

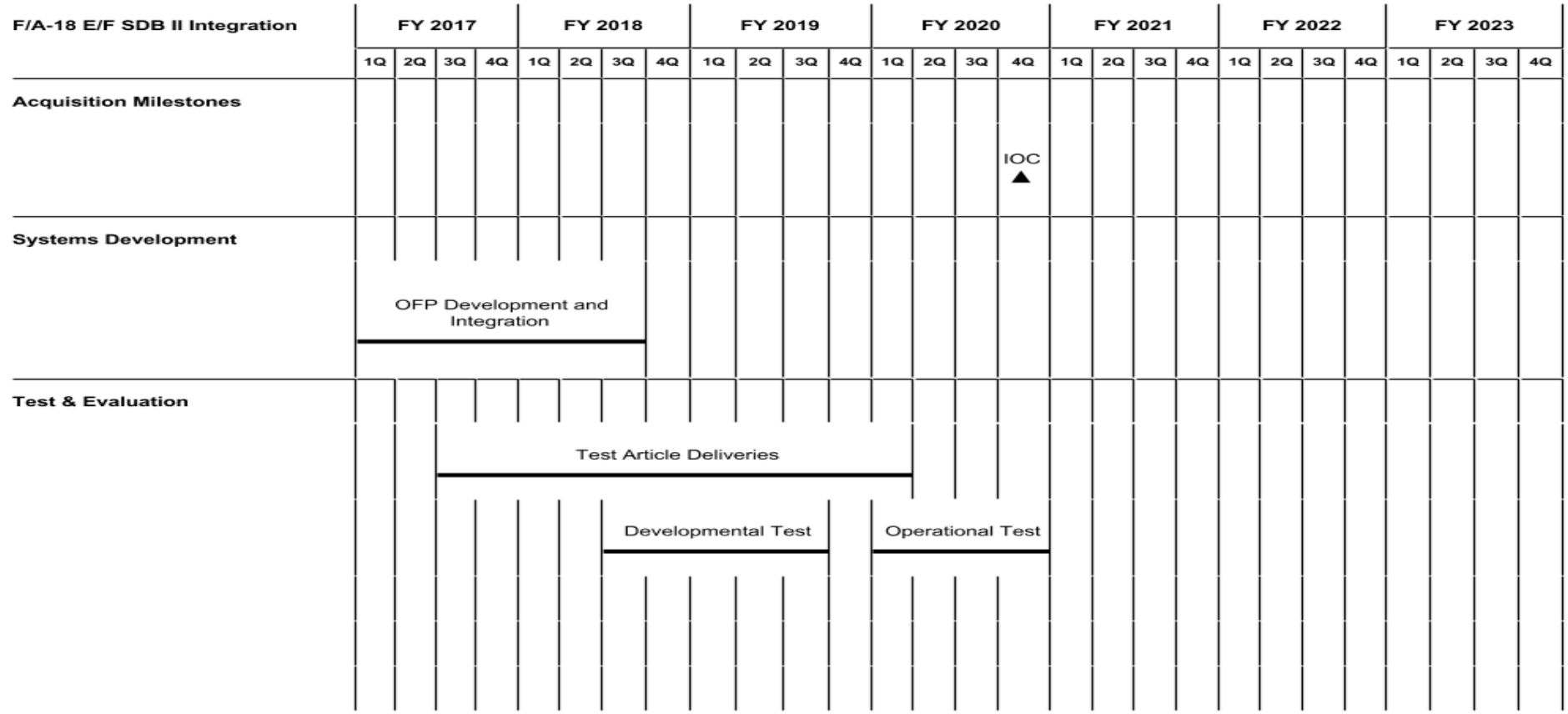
Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test	WR	VX-31 : China Lake, CA	0.000	0.000		0.000		6.464	Nov 2018	-		6.464	10.251	16.715	-
Operational Test	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.000		0.000		0.000		-		0.000	13.635	13.635	-
		Subtotal	11.486	2.000		12.874		13.061		-		13.061	28.789	68.210	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	53.016	45.356		50.546		31.875		-		31.875	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 1663 / *SDB II F-18 Integration*



2019DON - 0604329N - 1663

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 1663 / *SDB II F-18 Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F/A-18 E/F SDB II Integration				
Acquisition Milestones: IOC	4	2020	4	2020
Systems Development: OFP Development and Integration	1	2017	3	2018
Test & Evaluation: Test Article Deliveries	3	2017	1	2020
Test & Evaluation: Developmental Test	3	2018	3	2019
Test & Evaluation: Operational Test	1	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604329N / *Small Diameter Bomb (SDB)*	Project (Number/Name) 3072 / *Small Diameter Bomb (SDB)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3072: *Small Diameter Bomb (SDB)*	182.397	34.434	57.637	72.573	-	72.573	73.547	58.914	44.409	45.360	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 439

A. Mission Description and Budget Item Justification

SDB II is an ACAT IC program providing the warfighter a capability to attack mobile targets in all weather from Stand-Off range. The Air Force is the lead service. Raytheon in Tucson, AZ is the prime contractor. SDB II addresses the following warfighter requirements: attack mobile targets, multiple kills per pass, multiple ordnance carriage, all weather operations, near-precision munitions capability, capability against fixed targets, reduced munitions footprint, increased weapons effectiveness, minimized potential for collateral damage, reduced susceptibility of munitions to countermeasures, and a migration path to net centric ops capability.

This Project Unit includes all funding for DoN support on the DoN threshold platforms, F-35B and F-35C. The USMC requirement to field SDB II on F-35B is in F-35 Operational Flight Plan (OFP) Block 4.1. The F-35C is being conducted as part of Block 4.2. Commencing FY 2019, the F-35 integration will be using BRU-61 vice BRU-77 to carry the SDB II.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SDB II Weapon Support	9.064	25.948	35.157	0.000	35.157
Articles:	-	-	-	-	-
Description: Funding provides for SDB II Engineering Manufacturing and Development (EMD) efforts including weapon vendor support (Raytheon Missile Systems - RMS), test assets, and government support. Test articles were procured in prior years as part of a joint buy with the Air Force for a better priced quantity buy.					
FY 2018 Plans: Continue support of EMD and integration of SDB II with F-35B and F-35C.					
FY 2019 Base Plans: Begin Flight Sciences and Flight Test support and analysis for Development Test (DT). Testing includes, ejection tests, environmental & loads analysis and release envelope clearance. Funds formerly in PU 3082 to support the JMM BRU (BRU-77) program have been transferred to PU 3072 to support the integration of BRU-61 which is required to carry SDB II on Navy and Marine Corps aircraft.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3072 / *Small Diameter Bomb (SDB)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY 2018 to FY 2019 is to support the beginning of Development Test (DT).					
Title: JSF Integration	25.370	31.689	37.416	0.000	37.416
Articles:	-	-	-	-	-
Description: Funding provided for integration of SDB II on F-35B and F-35C, specifically for Lockheed Martin to develop F-35 Operational Flight Program (OFP) software, flight missions, and support and analysis of missions. ***FY 2018 Plans:*** Increase in the UAI contract to complete the final software testing of UAI into the JSF Operational Flight Program (OFP)and integration of SIL final validation of software functionality. Increase in Block 4 software to merge UAI software into baseline Block 4 software and modify as necessary. Begin participation in Block 4 Flight Sciences which conducts aircraft environment test, Ground Vibration, and Jettison testing to prove the weapon can safely separate from the aircraft without damaging the aircraft and establishes weapon carriage and release envelopes. Implement Bay Modifications to test aircraft in support of flight sciences and test. ***FY 2019 Base Plans:*** Conduct F-35 OFP Block 4 Flight Sciences which conducts aircraft environment test, Ground Vibration, and Jettison testing to prove the weapon can safely separate from the aircraft without damaging the aircraft and establishes weapon carriage and release envelopes. Begin DT flights. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY 2018 to FY 2019 is to support the beginning of Development Test (DT).					
Accomplishments/Planned Programs Subtotals	34.434	57.637	72.573	0.000	72.573

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE,AF/0604329F: *Small Diameter Bomb*	37.603	38.979	73,709.000	-	73,709.000	31.477	17.442	27.626	28.124	0.000	74,947.647

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3072 / *Small Diameter Bomb (SDB)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• MPAF/0207327F: *Small Diameter Bomb*	92.361	82.705	72.506	-	72.506	143.935	336.512	310.233	324.740	0.000	1,362.992
• WPN/BLI2238: *Small Diameter Bomb II*	0.000	20.968	91.272	-	91.272	118.461	114.754	117.019	119.502	0.000	581.976
• APN/BLI0720: *War Consumables*	0.000	0.000	9.000	-	9.000	17.247	17.381	17.726	17.820	Continuing	Continuing

Remarks

SDB II Lots 1-3 are USAF only procurements. The DON procurements begin with Lot 4 in FY 2018.

D. Acquisition Strategy

The SDB II acquisition strategy was to conduct a full and open competition to select up to two contractors to compete during a planned 42-month risk reduction phase prior to entering EMD. This competition began April 17, 2006 with the signature of contracts to the competing contractors: 1) Raytheon and 2) the team of Boeing and Lockheed Martin. A Fixed Price Incentive Firm Target type contract for EMD, including Firm Fixed Price procurement options for Lots 1-3 was awarded to Raytheon August 9, 2010. Lots 4 & 5 are included in the contract, but are Not-To-Exceed options. Milestone C was approved 4 June 2015, with Lot 1 (Air Force only) awarded 12 June 2015.

The Navy funding will support Navy-unique efforts for SDB Increment II, such as aircraft integration, ship suitability, studies and analysis, and program management and government in-house support. These efforts will be performed on several cost-type contracts or through cost reimbursable work requests to government activities and contractors.

E. Performance Metrics

Earned value management has been implemented on the EMD contract with Raytheon.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3072 / *Small Diameter Bomb (SDB)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - SDB II EMD	C/FPIF	Raytheon : Tucson, AZ	35.485	2.629	Mar 2017	20.408	Mar 2018	20.147	Mar 2019	-		20.147	65.861	144.530	144.530
Aircraft Integration - JSF	C/CPFF	Lockheed Martin : Fort Worth, TX	31.076	5.749	Jan 2017	4.104	Mar 2018	0.163	Mar 2019	-		0.163	0.163	41.255	41.255
Prior year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	11.238	0.000		0.000		0.000		-		0.000	0.000	11.238	-
Hardware Development - BRU-61	C/CPFF	Boeing : St. Charles, MO	4.259	0.000		0.000		5.000	Mar 2019	-		5.000	9.000	18.259	18.259
		Subtotal	82.058	8.378		24.512		25.310		-		25.310	75.024	215.282	N/A

Remarks

Primary Hardware Development to Raytheon in Tucson, AZ reflects the SDB II prime contractor and includes test assets and contractor costs to support F-35 integration. Funding increase in FY 2019 is for assets and engineering efforts to support Raytheon participation in F-35 flight sciences.

Funding for Lockheed Martin F-35 includes Associate Contractor Agreements (ACA), bay modifications, logistics efforts, and adapter hardware. It does not include OFP, UAI software coding, nor test missions which are represented in Support and Test sections, respectively.

Funding to Boeing for BRU-61 modifications required to carry SDB II on Navy and Marine Corps aircraft. Prior year efforts were to provide data and support to the BRU-77 contractor. The BRU-77 contract was terminated for convenience 19 Oct 2017.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development - JSF	C/CPFF	Lockheed Martin : Ft. Worth, TX	15.534	14.991	Jan 2017	24.169	Jan 2018	18.514	Jan 2019	-		18.514	17.596	90.804	90.804
Prior year Support cost no longer funded in the FYDP	Various	Various : Various	17.410	0.000		0.000		0.000		-		0.000	0.000	17.410	-
		Subtotal	32.944	14.991		24.169		18.514		-		18.514	17.596	108.214	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3072 / *Small Diameter Bomb (SDB)*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Studies and Analyses include Navy activities to define Concept of Operations (CONOPS) and better define Navy-specific and interoperability requirements, such as weapon data link advanced concept technology demonstration, seeker trade studies, and data link trade studies. Prior year Software Development efforts are in support of JSuW Joint Capability Technology Demonstrations incorporation of J.11 Message Set into Strike Weapons and Weapon Data Link Network efforts.

Software Development for F-35 is the UAI, OFP, and mission planning which supports the SDB II program.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	Various	Various : Various	2.864	1.853	May 2017	0.000		7.842	Nov 2018	-		7.842	26.873	39.432	-
Operational Test & Evaluation - SDBII	WR	COMOPTEVFOR : China Lake, CA	1.010	0.000		0.000		0.000		-		0.000	23.959	24.969	-
Developmental Test & Evaluation - SDB II	C/CPFF	Lockheed Martin : Ft. Worth, TX	0.000	0.000		3.416	Mar 2018	14.739	Mar 2019	-		14.739	7.853	26.008	26.008
Prior Year T&E cost no longer funded in the FYDP	Various	Various : Various	8.049	0.000		0.000		0.000		-		0.000	0.000	8.049	-
		Subtotal	11.923	1.853		3.416		22.581		-		22.581	58.685	98.458	N/A

Remarks

Developmental Test (DT) and Operational Test (OT) include all aspects of the weapon system - SDB II, BRU-61, and F-35B and F-35C aircraft OFP.

Developmental Test squadrons and locations for F-35B and F-35C are still uncertain as squadrons are being established.

Operational test is scheduled to begin in FY 2021 to support FY 2022 IOC.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Services	Various	Various : Various	3.220	0.657	Nov 2016	0.556	Nov 2017	0.691	Nov 2018	-		0.691	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3072 / *Small Diameter Bomb (SDB)*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC WD : China Lake,CA	29.262	4.400	Nov 2016	2.702	Nov 2017	2.422	Nov 2018	-		2.422	Continuing	Continuing	Continuing
Government Support	WR	Various : Various	9.668	2.325	Nov 2016	0.600	Nov 2017	0.750	Nov 2018	-		0.750	Continuing	Continuing	Continuing
Program Management Support	WR	Various : Various	11.141	1.750	Nov 2016	1.532	Nov 2017	2.225	Nov 2018	-		2.225	Continuing	Continuing	Continuing
Travel	WR	NAVAIR : Patuxent River, MD	2.181	0.080	Oct 2016	0.150	Oct 2017	0.080	Oct 2018	-		0.080	0.750	3.241	-
		Subtotal	55.472	9.212		5.540		6.168		-		6.168	Continuing	Continuing	N/A

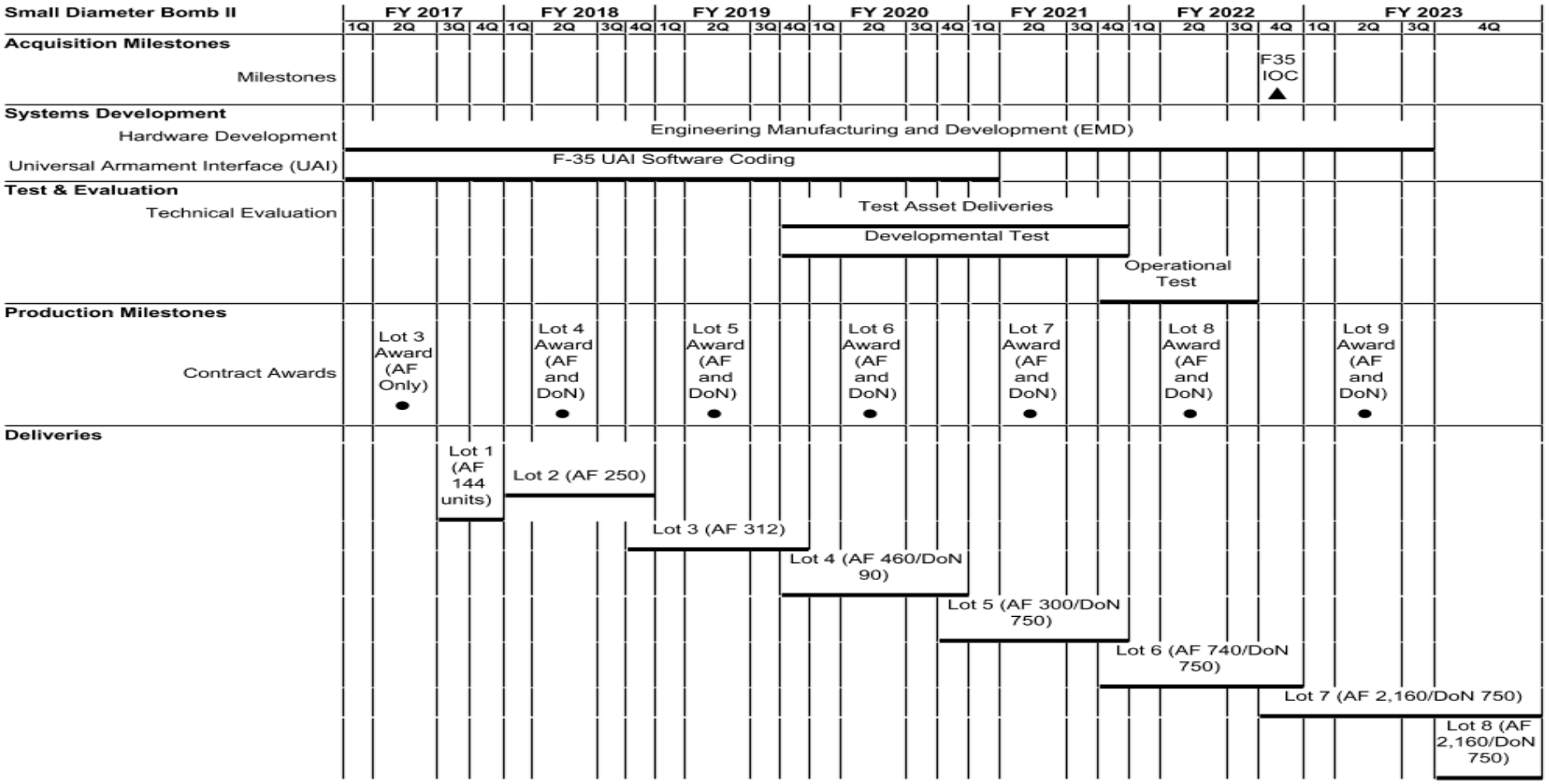
Remarks

Increase in FY 2019 for government support provides support for Development Test.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	182.397	34.434		57.637		72.573		-		72.573	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3072 / *Small Diameter Bomb (SDB)*



2019DON - 0604329N - 3072

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3072 / *Small Diameter Bomb (SDB)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Small Diameter Bomb II				
Acquisition Milestones: Milestones: F-35 IOC	4	2022	4	2022
Systems Development: Hardware Development: Engineering Manufacturing and Development (EMD)	1	2017	3	2023
Systems Development: Universal Armament Interface (UAI): F-35 OFP Software Coding	1	2017	1	2021
Test & Evaluation: Technical Evaluation: Test Asset Deliveries	4	2019	4	2021
Test & Evaluation: Technical Evaluation: Developmental Test	4	2019	4	2021
Test & Evaluation: Technical Evaluation: Operational Test	4	2021	3	2022
Production Milestones: Contract Awards: Lot 3 Award (AF Only)	2	2017	2	2017
Production Milestones: Contract Awards: Lot 4 Award (AF and DoN)	2	2018	2	2018
Production Milestones: Contract Awards: Lot 5 Award (AF and DoN)	2	2019	2	2019
Production Milestones: Contract Awards: Lot 6 Award (AF and DoN)	2	2020	2	2020
Production Milestones: Contract Awards: Lot 7 Award (AF and DoN)	2	2021	2	2021
Production Milestones: Contract Awards: Lot 8 Award (AF and DoN)	2	2022	2	2022
Production Milestones: Contract Awards: Lot 9 Award (AF and DoN)	2	2023	2	2023
Deliveries: Lot 1 Delivery (AF only 144 units)	3	2017	4	2017
Deliveries: Lot 2 Del (AF only 250 units)	1	2018	4	2018
Deliveries: Lot 3 Del (AF only 312 units)	4	2018	4	2019
Deliveries: Lot 4 Del (AF 460; DoN 90 units)	4	2019	4	2020
Deliveries: Lot 5 Del (AF 300; DoN 750 units)	4	2020	4	2021
Deliveries: Lot 6 Del (AF 740; DoN 750 units)	4	2021	4	2022
Deliveries: Lot 7 Del (AF 2,160; DoN 750 units)	4	2022	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3072 / *Small Diameter Bomb (SDB)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: Lot 8 Del (AF 2,160; DoN 750 units)	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604329N / *Small Diameter Bomb (SDB)*	Project (Number/Name) 3082 / *JMM BRU*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3082: *JMM BRU*	42.154	7.199	4.663	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	54.016
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Miniature Munitions Bomb Rack Unit (JMM BRU) is an Air Force (AF) led ACAT III program. It is required for the Department of the Navy's (DON) carriage of the SDB II weapon in the internal bay of the F-35B and F-35C and operation in the DON environment. The SDB II Capability Development Document (CDD) states that SDB II must be operable on the Miniature Munitions Smart Rack BRU-61/A. The BRU-61/A, currently in sustainment for the AF, does not meet the needs to operate with SDB II within the F-35 internal bay in the DON environment. The JMM BRU (BRU-77) fills the capability gap required by the DON. Efforts include development of a dual power capability to meet the SDB II operating environment on the F-35. The USMC requirement to field SDB II on F-35B is in F-35 Operational Flight Plan (OFP) Block 4.1. The F-35C is being conducted as part of Block 4.2.

The BRU-77 contract was terminated for convenience 19 Oct 2017. FY 2018 funding remains for termination costs. The requirement will now be supported by BRU-61 budgeted within PU 3072.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Joint Miniature Munitions Bomb Rack Unit (JMM BRU) Government Support	1.718	2.214	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Funding provided for the SDB II Carriage System support and integration into Navy environments. ***FY 2018 Plans:*** Contract with Raytheon was terminated 19 Oct 2017. Funds remain for contract termination costs. ***FY 2019 Base Plans:*** Contract with Raytheon was terminated 19 Oct 2017. Funds moved to PU 3072 to support BRU-61 mods required to carry SDB II on F-35. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Contract with Raytheon was terminated 19 Oct 2017. FY 2019 funding was realigned to PU 3072 to support BRU-61 mods required to carry SDB II on F-35.					
Title: Joint Miniature Munitions Bomb Rack (JMM BRU) Prime Contractor	5.481	2.449	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3082 / *JMM BRU*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
Description: Prime Contractor Support of JMM BRU (BRU-77) TD/EMD contract. ***FY 2018 Plans:*** Contract with Raytheon was terminated 19 Oct 2017. Funds remain for contract termination costs. ***FY 2019 Base Plans:*** Contract with Raytheon was terminated 19 Oct 2017. Funds moved to PU 3072 to support BRU-61 mods required to carry SDB II on F-35. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Contract with Raytheon was terminated 19 Oct 2017. FY 2019 funds were realigned to PU 3072 to support BRU-61 mods required to carry SDB II on F-35.					
Accomplishments/Planned Programs Subtotals	7.199	4.663	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The JMM BRU is an Air Force led ACAT III program. Competitive source selection conducted with Technology Development contract award 3QFY 2013. Milestone B was completed and Engineering, Manufacturing, and Development (EMD) contract awarded 4QFY 2015.

The BRU-77 contract was terminated for convenience 19 Oct 2017.

E. Performance Metrics

Earned value management is being implemented on the TD/EMD contract.

The BRU-77 contract was terminated for convenience 19 Oct 2017.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3082 / *JMM BRU*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Miniature Munitions Bomb Rack Unit (JMM BRU)	C/FPIF	Raytheon Technical Services Company LLC : Indianapolis, IN	20.765	5.480	Mar 2017	4.663	Mar 2018	0.000	Mar 2019	-		0.000	0.000	30.908	30.908
		Subtotal	20.765	5.480		4.663		0.000		-		0.000	0.000	30.908	N/A

Remarks

JMM BRU contract with Raytheon Intelligence Information Systems (RIIS, formerly RTSC) was terminated for convenience 19 October 2017. FY 2018 funding remains for contract termination costs.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CAATS	Various	NAWC AD : Lakehurst	2.100	0.417	Feb 2017	0.000	Feb 2018	0.000	Feb 2019	-		0.000	0.000	2.517	-
		Subtotal	2.100	0.417		0.000		0.000		-		0.000	0.000	2.517	N/A

Remarks

JMM BRU contract with Raytheon Intelligence Information Systems (RIIS, formerly RTSC) was terminated for convenience 19 October 2017. FY 2018 funding remains for contract termination costs.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Test	Various	Various : Various	0.000	0.000	Mar 2017	0.000	Mar 2018	0.000	Mar 2019	-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	N/A

Remarks

JMM BRU contract with Raytheon Intelligence Information Systems (RIIS, formerly RTSC) was terminated for convenience 19 October 2017. FY 2018 funding remains for contract termination costs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3082 / *JMM BRU*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC WD : China Lake, CA	11.467	0.890	Nov 2016	0.000	Nov 2017	0.000	Nov 2018	-		0.000	0.000	12.357	-
Government Support	WR	Various : Various	6.945	0.412	Nov 2016	0.000	Nov 2017	0.000	Nov 2018	-		0.000	0.000	7.357	-
Contractor Services	MIPR	AFLCMC : Eglin AFB, FL	0.506	0.000		0.000		0.000		-		0.000	0.000	0.506	-
Travel	MIPR	ASC20OG : Eglin AFB, FL	0.371	0.000	Oct 2016	0.000	Oct 2017	0.000		-		0.000	0.000	0.371	-
		Subtotal	19.289	1.302		0.000		0.000		-		0.000	0.000	20.591	N/A

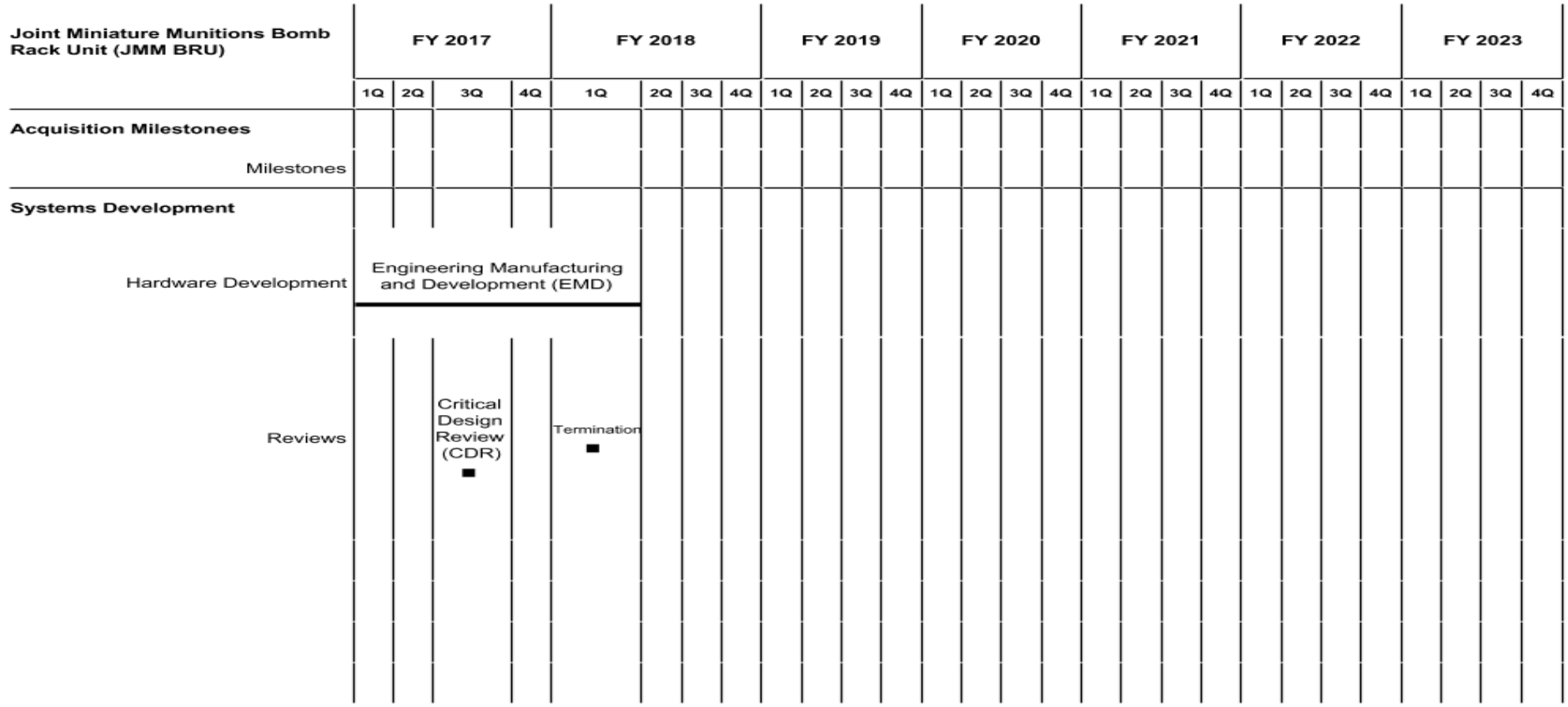
Remarks

JMM BRU contract with Raytheon Intelligence Information Systems (RIIS, formerly RTSC) was terminated for convenience 19 October 2017. FY 2018 funding remains for contract termination costs.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	42.154	7.199		4.663		0.000		-		0.000	0.000	54.016	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3082 / *JMM BRU*



2019PB - 0604329N - 3082

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604329N / *Small Diameter Bomb (SDB)*	**Project (Number/Name)** 3082 / *JMM BRU*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Joint Miniature Munitions Bomb Rack Unit (JMM BRU)				
Systems Development: Hardware Development: Engineering Manufacturing and Development (EMD)	1	2017	1	2018
Systems Development: Reviews: Critical Design Review (CDR)	3	2017	3	2017
Systems Development: Reviews: Contract Termination for Convenience	1	2018	1	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604366N *I Standard Missile Improvements*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	2,347.892	113.601	158.578	165.881	-	165.881	93.175	47.434	16.113	16.552	Continuing	Continuing
0439: *Standard Missile Improvement*	1,147.781	23.046	50.188	110.058	-	110.058	86.922	41.683	11.811	12.125	Continuing	Continuing
3092: *Standard Missile 6 Program*	1,200.111	90.555	108.390	55.823	-	55.823	6.253	5.751	4.302	4.427	Continuing	Continuing

A. Mission Description and Budget Item Justification

STANDARD Missile (SM) is Navy's premier Anti-Air Warfare (AAW) missile, providing both area defense for the Fleet and self-defense for individual AEGIS CGs and DDGs, as required by the Joint Theater Air Missile Defense (TAMD), Mission Need Statement (MNS), Defense Planning Guidance (DPG), Quadrennial Defense Review (QDR), and Ship Class AAW Self Defense Capstone Requirements Document. SM-6 provides an air defense force multiplier to the U.S. Navy to greatly expand the AWS battlespace. Combining a modified AMRAAM active seeker onto the proven STANDARD Missile airframe, SM-6 provides an extended range (ER) anti-air warfare capability both over sea and overland. This low-risk approach relying on non-developmental items supported an FY 2011 Initial Operating Capability. With integrated fire control support, SM-6 BLK I ER provides the Navy with an increased battlespace against Anti-Air Warfare (AAW) threats over-the-horizon.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	120.561	158.578	148.471	-	148.471
Current President's Budget	113.601	158.578	165.881	-	165.881
Total Adjustments	-6.960	0.000	17.410	-	17.410
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.026	0.000			
• SBIR/STTR Transfer	-3.934	0.000			
• Program Adjustments	0.000	0.000	28.000	-	28.000
• Rate/Misc Adjustments	0.000	0.000	-10.590	-	-10.590
• Congressional Directed Reductions Adjustments	-14.000	-	-	-	-
• Congressional Add Adjustments	14.000	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by $4.000 million to account for the availability of prior year execution balances.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604366N *I Standard Missile Improvements*

Proj 0439:
FY 2017 Standard Missile Improvements reflects reductions for SBIR ($.941M) and a Below Threshold Reprogramming ($1.0M).

FY 2019 Standard Missile Improvements reflects realignment of funding from Project 0439 to MILCON appropriation($5.0M), a Technical Adjustment realignment($4.2M) and rate/miscellaneous adjustments ($0.9M) due to purchase inflation.

FY 2019 Standard Missile Improvements reflects increases for SM-2 Improvements being designated as an Accelerated Acquisition Program ($33.0M).

Project 3092:
FY 2017 Future Capabilities reflects reductions for SBIR ($3.0M) and a Below Threshold Reprogramming ($2.0M).

FY 2019 Future Capabilities reflects reductions in Miscellaneous Adjustments ($1.4M) due to purchase inflation.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604366N / *Standard Missile Improvements*	Project (Number/Name) 0439 / *Standard Missile Improvement*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0439: *Standard Missile Improvement*	1,147.781	23.046	50.188	110.058	-	110.058	86.922	41.683	11.811	12.125	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Missile Integration with Air and Missile Defense S-Band Radar (AMDR-S) for DDG 51 Flight III ships, and with other platforms/Combat System baselines, will include requirements review/updates and analysis, verification; technical documentation, design review and working group SME support, missile/radar integration, missile test hardware procurement, risk assessment, safety, test and evaluation planning, analysis, and data collection. Deliverables include interface control documents (ICDs) changes, missile specifications changes, and engineering documents updates to support AEGIS Configuration Baseline (ACB) 20 Preliminary Design Review (PDR) (FY 2018), Critical Design Review (CDR) (FY 2019); Engineering Development Model (EDM) testing (FY 2016-2018); Combat Systems Engineering Development Site (CSEDS) , Moorestown, New Jersey Combat System/missile integration testing (FY 2018-2020); Waterfront Integration Testing (WIT) FY 2022 and ACB 20 for DDG 51 FLT III Electromagnetic Environmental Effects (E3) and Hazard of Electromagnetic Radiation to Ordnance (HERO) Testing, analysis, and reports. Missile variants: ESSM BLK 1 and 2; SM-2 BLK IIIB MU2; SM-6 BLK I and IA (Current AEGIS configuration).

STANDARD Missile 2 (SM-2 BLK IIIC) engineering changes funding is for the design, systems engineering, analysis, integration, and test of replacements for obsolete components as well as performance improvements to address emerging threats. Analysis will include evaluation of transition to an active seeker baseline leveraging the investment made with the SM-6 and ESSM Block II missiles. Initial funding is for the requirements generation, risk reduction/mitigation, and documentation leading to the commencement of the obsolescence project. Capability improvements: Enhanced Stream-Raid performance against numerous threats to include Agile Prism via target resolution in range and Doppler and missile/target pairing logic, over-the-horizon capability for increased depth of fire, enhanced capability against electronic attack, improved firepower due to decreased dependence on illuminators, and enhanced fuzing via guidance integrated fuzing. The program has been designated an Accelerated Acquisition (AA) program by the CNO/ASN RDA. The program schedule will be shifted to reflect the change in process. The goal is to reach Initial Capability (IC) by Q3FY2022.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Air and Missile Defense Radar (AMDR) Integration & Test	10.254	11.967	10.881	0.000	10.881
Articles:	-	-	-	-	-
FY 2018 Plans: Provide Principal for Safety (PFS) and systems safety engineering support. Interface with Weapon System Explosive Safety Review Board (WSESRB) board members and review safety documentation as required. Continue to support and conduct early stage radar/Combat System/Missile integration/risk reduction testing with Missile Communication Test Set (MCTS)/Missile Simulator Unit (MSU) at the RIDS, Sudbury Facility or ARDEL/					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 0439 / *Standard Missile Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
PMRF. Complete E3/HERO design, analysis, and qualification testing. Develop, integrate, and test ET-17 solution to address missile combat system interface and cyber security issues. Conduct planning and configure SM-6 Internal Missile Initializer and Power Supply (IMIPS) Inert Operating Missile (IOM) in preparation for land based testing at Combat System Engineering Development Site (CSEDS) in FY 19. Conduct E3 test using inert operational missile with SPY-6 engineering development model array. Support verification analysis; technical documentation updates, special studies, design review and working group SME support, risk assessment, safety, test and evaluation planning, analysis, and data collection. Prepare for and support ACB 20 PDR and address Missile/ET17 related activities. ***FY 2019 Base Plans:*** Plan, support and conduct missile, radar and combat system (CS) testing at CSEDS (Lockheed Martin Moorestown)/SCSC (Surface Combat Systems Center Wallops Island). Continue to develop, integrate, and test ET-17 solutions to address missile/CS interface and cyber security issues. Prepare for and support ACB 20 CDR and address missile/ET-17 related actions. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 decrease is due to the transition from development to the initiation of testing of a new software build in FY 2018. In FY 2019, the development is complete and the program is testing and fielding the new software build. To control cost, the missile test program in FY 2019 is currently aligned with the Combat System Test Program.					
Title: Standard Missile-2 Improvement	12.792	38.221	99.177	0.000	99.177
Articles:	-	-	-	-	-
FY 2018 Plans: Award Engineering Manufacturing and Development (EMD) contract. Complete Preliminary Design Review (PDR) for Jet Tab Assembly (JTA) (critical path item). Refine Modeling & Simulation tools, develop hardware modification tasks and perform Guidance navigational control (GNC) design tasks, Perform wind tunnel testing to lock in/validate accuracy and precision of models. Identify changes to canister electronic and mechanical interface change documents. Begin the design and validation of new hardware (i.e jet tab assemblies, Dorsal fins, and hybrid control surface assembly) required to meet medium range requirements. Conduct risk reduction/ mitigation activities to clearly identify and reduce risk. Continue efforts for a completion contract for the project with the prime contractor. Continue Insensitive Munitions (IM) effort to enhance the safety and reaction of					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 0439 / *Standard Missile Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
our weapons including preliminary design efforts for a single pulse Electronic Ignition Safety Device (EISD), potentially for MK-104 dual thrust rocket motor (DTRM) in an emergent SM-2 improvements effort. ***FY 2019 Base Plans:*** Prepare for and support a Rapid Fielding Decision(RFD). Complete Low Rate Initial Production I (LRIP-I) Request for Proposal. LRIP-I will consist of 20 All Up Rounds (AUR). Perform and support WSESRBs. Perform Jet tab assemblies, Hybrid control surface assembly and dorsal fins prototype testing to verify design. Continue Vertical Launch System (VLS) and canister development efforts. Begin VLS software testing. Continue AUR component development and testing, as well as missile software development. Qualify Insensitive Munitions (IM) efforts that enhance the safety and reaction of our weapons for a single pulse Electronic Ignition Safety Device (EISD). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase in FY 2019 is due to the SM-2 BLK IIIC (SM-2 Improvements) program being designated an Accelerated Acquisition (AA) program by CNO/ASN RDA. A significant amount of concurrent development work (missile/Launcher/Weapon System) is required in FY 2019 to prepare for the first live fire in FY 20. Funding is required to deliver by FY 2022 versus the original Program Of Record of FY 2024.					
Accomplishments/Planned Programs Subtotals	23.046	50.188	110.058	0.000	110.058

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Engineering and integration testing for SM-2 Improvements in FY 2017-FY2 202 to support Developmental Test in FY 2020 and continue follow-on ship integration and design update effort in FY 2021.

E. Performance Metrics

Perform E3/HERO design, analyses, and E3/HERO qualification tests for AMDR in FY 2017-2018.

AMDR WSESRB in FY2017.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 0439 / *Standard Missile Improvement*

AMDR MCTS/MSU Uplink/Downlink testing is planned for FY 2017/2018.

AMDR IOM, MSU, or VOM testing is planned for FY2019-2021.

Combat System Integration for AMDR is planned for FY2019-2021

Waterfront Integration Testing for AMDR is planned for FY2021/2022.

AMDR DDG 51 FLT III IOC 4Q2023

AMDR ET-17 MSLEX 4Q2022

SM Improvements Preliminary Design IPR in FY2018.

SM Improvements SSSTRP in FY2019.

SM Improvements WSESRB in FY2019.

SM Improvements Developmental Test in FY2021.

SM Improvements Obtain Initial Capability approval in FY 2022.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604366N / *Standard Missile Improvements*	Project (Number/Name) 0439 / *Standard Missile Improvement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design and Analysis1	C/CPFF	RAYTHEON : Tucson, AZ	293.551	11.958	Nov 2016	37.623	Nov 2017	58.980	Nov 2018	-		58.980	Continuing	Continuing	Continuing
Design and Analysis2	C/CPFF	JHU/APL : Laurel, MD	8.656	3.250	Nov 2016	4.718	Nov 2017	7.799	Nov 2018	-		7.799	0.000	24.423	-
Design and Analysis3	MIPR	MIT/Lin Lab : Lexington, MA	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
Design and Analysis4	WR	NSWC : Dahlgren	789.367	0.238	Nov 2016	0.881	Nov 2017	0.971	Nov 2018	-		0.971	0.000	791.457	-
Design and Analysis5	WR	NSWC : Indian Head	0.940	0.000		0.000		0.100	Nov 2018	-		0.100	0.000	1.040	-
Design and Analysis6	WR	NAWC : China Lake	4.779	0.250	Nov 2016	0.600	Nov 2017	0.795	Nov 2018	-		0.795	0.000	6.424	-
Design and Analysis7	Various	LOCKHEED MARTIN : Moorestown, NJ	17.775	0.000		0.000		0.000		-		0.000	0.000	17.775	-
Design and Analysis8	WR	CNO : Washington, DC	0.010	0.000		0.000		0.000		-		0.000	0.000	0.010	-
Design and Analysis9	WR	CMDP : Phoenix, AZ	4.795	0.000		0.000		0.000		-		0.000	0.000	4.795	-
Design and Analysis11	WR	NSWC : Crane	0.257	0.000		0.000		0.000		-		0.000	0.000	0.257	-
Design and Analysis12	WR	DOI&CNAP : Washington, DC	0.487	0.000		0.000		0.000		-		0.000	0.000	0.487	-
Design and Analysis13	WR	COMPTEVFOR : Norfolk, VA	0.100	0.100	Nov 2016	0.100	Nov 2017	0.100	Nov 2018	-		0.100	0.000	0.400	-
Design and Analysis14	C/CPFF	LOCKHEED MARTIN : Moorestown, NJ	2.000	0.000		0.000		0.000		-		0.000	0.000	2.000	-
Design and Analysis15	WR	CARDEROCK : Bethesda, MD	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
Design and Analysis16	WR	NWAS : Corona	0.736	0.200	Nov 2016	0.500	Nov 2017	0.320	Nov 2018	-		0.320	0.000	1.756	-
Design and Analysis17	C/CPFF	CORVID : Mooresville, NC	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Design and Analysis18	C/CPFF	BAE : Rockville, MD	0.172	0.000		0.000		0.000		-		0.000	0.000	0.172	-
Design and Analysis19	MIPR	MDA : Dahlgren,VA	1.257	0.000		0.000		0.000		-		0.000	0.000	1.257	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604366N / *Standard Missile Improvements*	Project (Number/Name) 0439 / *Standard Missile Improvement*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design and Analysis20	WR	IWS3D : ARLINGTON, VA	1.500	0.000		0.000		0.000		-		0.000	0.000	1.500	-
Design and Analysis21	WR	VARIOUS : IWS (IWS 1)	11.071	6.210	Nov 2016	4.226	Nov 2017	27.256	Nov 2018	-		27.256	0.000	48.763	-
Design and Analysis22	WR	IWS3L : Arlington, Va	0.000	0.000		0.000		7.070	Nov 2018	-		7.070	0.000	7.070	-
Design and Analysis23	WR	NSWC : PHD	0.000	0.000		0.684	Nov 2017	0.100	Nov 2018	-		0.100	0.000	0.784	-
		Subtotal	1,137.653	22.206		49.332		103.491		-		103.491	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEVELOPMENTAL TEST & EVALUATION1	WR	NSWC : Port Hueneme	0.185	0.000		0.000		0.000		-		0.000	0.000	0.185	-
DEVELOPMENTAL TEST & EVALUATION2	WR	WSMR : New Mexico	1.600	0.000		0.000		5.000	Nov 2018	-		5.000	0.000	6.600	-
DEVELOPMENTAL TEST & EVALUATION3	WR	NAWC : Pt Mugu	0.098	0.000		0.000		0.000		-		0.000	0.000	0.098	-
DEVELOPMENTAL TEST & EVALUATION4	WR	PMRF : Hawaii	0.338	0.000		0.000		0.000		-		0.000	0.000	0.338	-
DEVELOPMENTAL TEST & EVALUATION5	WR	NSWC : PHD/ Techrep	0.567	0.000		0.000		0.000		-		0.000	0.000	0.567	-
DEVELOPMENTAL TEST & EVALUATION6	SS/CPFF	RAYTHEON : Tucson, Az	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
DEVELOPMENTAL TEST & EVALUATION7	C/CPFF	JHU/APL : Laurel, Md	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	2.788	0.000		0.000		5.000		-		5.000	0.000	7.788	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 0439 / *Standard Missile Improvement*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CONTRACTOR ENGINEERING SUPPORT	C/CPAF	VARIOUS : VARIOUS	2.630	0.000		0.000		0.000		-		0.000	0.000	2.630	-
PROGRAM MANAGEMENT SUPPORT	C/CPAF	VARIOUS : VARIOUS	4.434	0.780	Nov 2016	0.796	Nov 2017	1.537	Nov 2018	-		1.537	0.000	7.547	-
TRAVEL	Allot	IWS3 : Arlington, VA	0.276	0.060	Nov 2016	0.060	Nov 2017	0.030	Nov 2018	-		0.030	0.000	0.426	-
		Subtotal	7.340	0.840		0.856		1.567		-		1.567	0.000	10.603	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,147.781	23.046		50.188		110.058		-		110.058	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 0439 / *Standard Missile Improvement*

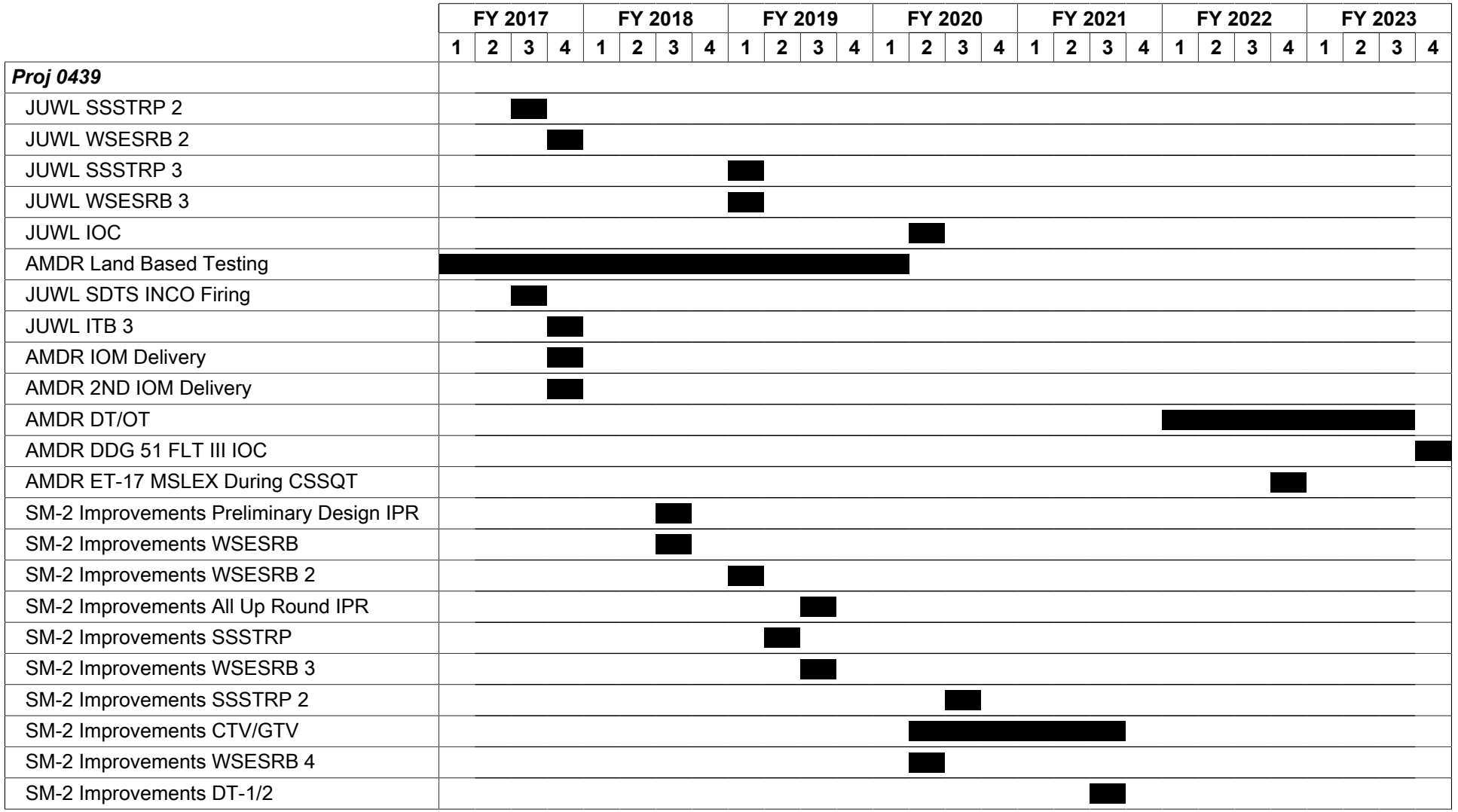

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 0439 / *Standard Missile Improvement*

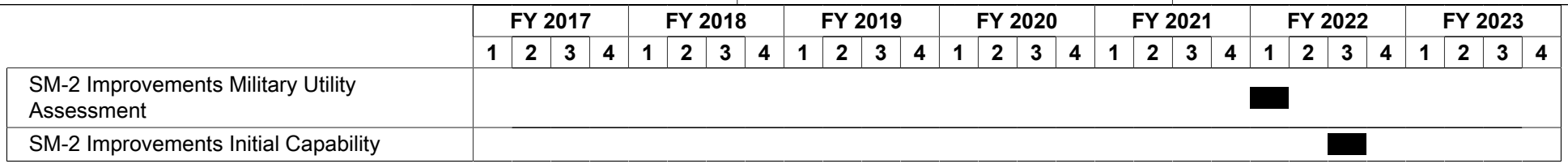

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 0439 / *Standard Missile Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0439				
JUWL SSSTRP 2	3	2017	3	2017
JUWL WSESRB 2	4	2017	4	2017
JUWL SSSTRP 3	1	2019	1	2019
JUWL WSESRB 3	1	2019	1	2019
JUWL IOC	2	2020	2	2020
AMDR Land Based Testing	1	2017	1	2020
JUWL SDTS INCO Firing	3	2017	3	2017
JUWL ITB 3	4	2017	4	2017
AMDR IOM Delivery	4	2017	4	2017
AMDR 2ND IOM Delivery	4	2017	4	2017
AMDR DT/OT	1	2022	3	2023
AMDR DDG 51 FLT III IOC	4	2023	4	2023
AMDR ET-17 MSLEX During CSSQT	4	2022	4	2022
SM-2 Improvements Preliminary Design IPR	3	2018	3	2018
SM-2 Improvements WSESRB	3	2018	3	2018
SM-2 Improvements WSESRB 2	1	2019	1	2019
SM-2 Improvements All Up Round IPR	3	2019	3	2019
SM-2 Improvements SSSTRP	2	2019	2	2019
SM-2 Improvements WSESRB 3	3	2019	3	2019
SM-2 Improvements SSSTRP 2	3	2020	3	2020
SM-2 Improvements CTV/GTV	2	2020	3	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 0439 / *Standard Missile Improvement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SM-2 Improvements WSESRB 4	2	2020	2	2020
SM-2 Improvements DT-1/2	3	2021	3	2021
SM-2 Improvements Military Utility Assessment	1	2022	1	2022
SM-2 Improvements Initial Capability	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604366N / *Standard Missile Improvements*	Project (Number/Name) 3092 / *Standard Missile 6 Program*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3092: *Standard Missile 6 Program*	1,200.111	90.555	108.390	55.823	-	55.823	6.253	5.751	4.302	4.427	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program leverages existing missile technology and advanced missile technology. It aligns missile technology roadmaps across the services (NAVSEA, NAVAIR, USAF, USMC and USA) and missile variants within the services, taking advantage of the Navy's investment in the AEGIS Weapons System (AWS), Cooperative Engagement Capability (CEC), and airborne early warning systems. This missile will provide an extended range engagement capability to provide the air superiority and the umbrella of protection for joint U.S. forces and allies against the full spectrum of manned-fixed and rotary-wing aircraft, unmanned aerial vehicles, and land attack and anti-ship cruise missiles in flight, thereby contributing to the continuous protection of forward deployed ground maneuver forces as well as theater rear assets as discussed in the Joint Theater Air Missile Defense (TAMD) Mission Need Statement (MNS), Defense Planning Guide (DPG), Quadrennial Defense Review (QDR), TAMD Capstone Requirements Document, Forward From the Sea, Joint Vision 2010/2020, the 2002/2003 Naval Transformational Roadmap, the Operational Requirements Document for SM-6 BLK 1, and the SM-6 Capability Production Document.

SM-6 portion of Joint and Naval Integrated Fire Control (IFC) is to support the integration, land-based and at-sea test, and analysis in support of the NIFC-CA test and evaluation strategy. NIFC-CA Increment 1 was successfully executed between 2009 and 2015. NIFC-CA Increment 2 commenced in FY 16 and will be delivered as a FY19 and FY23 capability. It integrates sensor improvements, SM-6 BLK IA, CEC and AWS ACB 16 into an advanced from the sea (FTS) Kill chain. Efforts include support for the WSMR upgrade, Trackex events, Integration Events and Live Fire test at land based and at-sea tests.

Future Capabilities Demonstration project supports systems engineering, SM demonstrations, captive flight tests, data collection, and analysis tasks to develop and demonstrate new capabilities for the SM-6 Missile. These capabilities directly support high priority mission requirements requested by Combatant Commanders. Additional details are held at a higher classification.

SM-6 System Engineering and Flight Test Support project supports the completion of SM-6 Follow-On Test and Evaluation (FOT&E) flight tests and Runs for the Record (RFR) required for SM-6 Full Operational Capability (FOC), the completion of Verification of Correction of Deficiencies (VCD) regression flight tests for OT-5/15 deficiencies and associated RFR required for SM-6 FOC, and other SM-6 BLK I test events.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SM-6 System Engineering and Flight Test Support	23.868	6.200	5.500	0.000	5.500
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 3092 / *Standard Missile 6 Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Prepare for and support AEGIS Speed to Capability (ASToC) efforts, Combat System Ship Qualifications Trials (CSSQTs), and Fleet firings. Conduct ongoing assessments of capabilities against emerging threats. Collection of data, performance analysis, and reliability assessments. Conduct flight test for SWA for regression testing. Commence work for missile software updates for SM 6 BLK I. ***FY 2019 Base Plans:*** Complete missile software updates work for SM-6 BLK I. Conduct follow on regression test. Perform a flight test, at Pt Mugu, for the collection of data, performance and analysis, and reliability assessments. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease in FY 2019 corresponds to completion of software development activities and transition to test and evaluation and fielding for the new software build.					
Title: Naval Integrated Fire Control - Counter Air (NIFC-CA)	2.147	6.191	2.988	0.000	2.988
Articles:	-	-	-	-	-
FY 2018 Plans: Continue supporting Increment 2 System of System (SoS) integration and test activities associated with the WSMR Desert Ship Upgrade. Continue integrating SM-6 6DoF updates into the NIFC-CA Federation Support Quarterly Program Reviews, Performance Assessment Working Groups, Modeling and Simulation Working Group, and System Engineering Integration and Test Working Group. Support test event At-Sea (4), Live Fire Test (LFT) (7), and At-Sea (5), and post event performance analysis. ***FY 2019 Base Plans:*** Continue supporting Increment 2 System of System (SoS) integration and test activities associated with the White Sands Missile Range (WSMR) Desert Ship Upgrade. Commence work for SM-6 BLK I and IA NIFC-CA related software upgrades. Support test event LFT (8) and At-Sea (6). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease is due to supporting three test events in FY 2018 versus two test events in FY 2019.					
Title: Future Capability Demonstration	64.540	95.999	47.335	0.000	47.335

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 3092 / *Standard Missile 6 Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
FY 2018 Plans: Continue development of additional capabilities in SM-6 Blk IA missile. Complete preparation for and support Future Capability Demonstration At-Sea Test 3 (two CTVs, one GTV, and one TACDEMO flight) at the Pacific Missile Range Facility (PMRF) in 3QFY18. Prepare for Future Capability Demonstration Land-Based Test 1 (two TACDEMO flights) at White Sands Missile Range in 2QFY19 and Future capability Demonstration At-Sea 4 (one TACDEMO flight) at PMRF in 1Q20. Conduct captive flight tests (CFTs) for collection of data, performance analysis, and reliability assessments. Conduct necessary missile and AEGIS combat system software development. Additional details are held at a higher classification.					
FY 2019 Base Plans: Continue development of additional capabilities in SM-6 Blk IA missile. Complete preparation for and support Future Capability Demonstration Land-Based Test 1 (two TACDEMO flights) at White Sands Missile Range in 2QFY19. Complete all preparations for Future Capability Demonstration At-Sea Test 4 (one TACDEMO flight) at Pacific Missile Range Facility (PMRF) in 1QFY20. Conduct captive flight tests (CFTs) for collection of data, performance analysis, and reliability assessments. Complete missile and AEGIS combat system software development and conduct necessary software alignment with other SM-6 capabilities. Additional details are held at a higher classification.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The reduction is due to supporting four (4) At-Sea flight tests in FY 2018 versus two (2) Land Based flight tests in FY 2019 and much of the software development work will be complete in FY 2018. Additional details are held at a higher classification.					
Accomplishments/Planned Programs Subtotals	90.555	108.390	55.823	0.000	55.823

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• WPN 2234: *Standard Missile*	491.212	546.083	490.210	-	490.210	488.631	490.739	489.059	489.310	3,333.056	9,076.631
• Standard Missile: *QTY*	108.000	125.000	125.000	-	125.000	125.000	125.000	125.000	125.000	386.000	1,800.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 3092 / *Standard Missile 6 Program*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

SM-6 Acquisition Strategy signed by OSD AT&L 14 March 2012.

E. Performance Metrics

Accomplishments
- Future Capability Demonstration Captive Flight Test 2nd quarter 2015 - 1st quarter 2016
- Future Capability Demonstration Captive Test Vehicle events Feb 2015
- DT (FOT&E) 2015
- Future Capability Demonstration At-Sea Test (2) Jan 2016
- NIFC-CA At-Sea Test (3) Sep 2016
- NIFC-CA Live Fire Test (4) (Joint Strike Fighter Demo) Sep 2016
- OT (FOT&E) Jan 2016
- Future Capability Demonstration Captive Flight Test (CFT) (3) Mar 2017
- NIFC-CA Live Fire Test (5) May 2017
- Operational Test (OT-5/15) Apr 2017
- Full Operational Capability (FOC) Dec 2017

Upcoming Milestones
- Integrated Fire Control (IFC) Increments I (Oct 2008-Sep 2015) and II (Oct 2015-Sep 2022)
- Future Capability Demonstration At-Sea Test (3) 3Q FY 18
- Future Capability Demonstration Land-Based Test (1) 2Q FY 19
- Future Capability Demonstration At-Sea Test (4) 1Q FY 20
- Future Capability Demonstration Captive Flight Test (CFT) (4) 1Q-2Q FY 18
- Future Capability Demonstration Captive Flight Test (CFT) (5) 4Q FY 18 - 1Q FY 19
- NIFC-CA At-Sea Test (5) Mar 2018
- NIFC-CA Live Fire Test (7) Sep 2018
- NIFC-CA Live Fire Test (8) Mar 2019
- NIFC-CA At-Sea Test (6) Jul 2019

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604366N / *Standard Missile Improvements*	Project (Number/Name) 3092 / *Standard Missile 6 Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design & Analysis	C/CPFF	RAYTHEON : Tucson, AZ	725.198	37.470	Nov 2016	46.109	Nov 2017	17.352	Nov 2018	-		17.352	Continuing	Continuing	Continuing
Design & Analysis	C/CPFF	JHU/APL : Laurel MD	55.081	5.088	Nov 2016	5.523	Nov 2017	5.144	Nov 2018	-		5.144	0.000	70.836	-
Design & Analysis	MIPR	MIT/Lin Lab : Lexington, MA	0.550	0.000		0.000		0.000		-		0.000	0.000	0.550	-
Design & Analysis	WR	NAWC : China Lake	5.405	0.363	Nov 2016	0.321	Nov 2017	0.480	Nov 2018	-		0.480	0.000	6.569	-
Design & Analysis	WR	NSWC : Dahlgren	11.789	0.160	Nov 2016	0.211	Nov 2017	0.000		-		0.000	0.000	12.160	-
Design & Analysis	WR	NSWC : Indian Head	3.942	0.000		0.000		0.000		-		0.000	0.000	3.942	-
Design & Analysis	WR	NSWC : PHD	10.917	0.150	Nov 2016	0.250	Nov 2017	0.000		-		0.000	0.000	11.317	-
Design & Analysis	WR	NSWC : Crane	1.256	0.000		0.000		0.000		-		0.000	0.000	1.256	-
Design & Analysis	MIPR	JSPO : Eglin AFB	24.049	0.000		0.000		0.000		-		0.000	0.000	24.049	-
Design & Analysis	C/CPFF	LOCKHEED Martin : Moorestown, NJ	6.074	0.000		0.000		0.000		-		0.000	0.000	6.074	-
Design & Analysis	WR	NSWC : Corona	20.233	0.431	Nov 2016	1.000	Nov 2017	0.000		-		0.000	0.000	21.664	-
Design & Analysis	Reqn	ONR : Arlington, VA	5.320	0.000		0.000		0.000		-		0.000	0.000	5.320	-
Design & Analysis	Reqn	NRL : Washington, DC	0.140	0.000		0.000		0.000		-		0.000	0.000	0.140	-
Design & Analysis	WR	COMPTEVFOR : Norfolk, VA	2.495	0.125	Nov 2016	0.000		0.000		-		0.000	0.000	2.620	-
Design & Analysis	WR	CARDEROCK : Philadelphia, PA	3.658	0.200	Nov 2016	0.200	Nov 2017	0.000		-		0.000	0.000	4.058	-
Design & Analysis	WR	NSWC : Pt Mugu	0.613	0.000		0.000		0.000		-		0.000	0.000	0.613	-
Design & Analysis	C/CPFF	BAE : Rockville, MD	6.486	0.000		0.000		0.000		-		0.000	0.000	6.486	-
Design & Analysis	MIPR	ARMY : Redstone	0.350	0.000		0.000		0.000		-		0.000	0.000	0.350	-
Design & Analysis	WR	NAWCAD : Pax River, MD	3.712	0.000		0.050	Nov 2017	0.000		-		0.000	0.000	3.762	-
Design & Analysis	C/CPFF	CORVID : Mooresville, NC	7.100	3.000	Nov 2016	3.200	Nov 2017	1.670	Nov 2018	-		1.670	0.000	14.970	-
Design & Analysis	C/CPFF	RNB : Arlington, VA	0.010	0.000		0.000		0.000		-		0.000	0.000	0.010	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604366N / *Standard Missile Improvements*	Project (Number/Name) 3092 / *Standard Missile 6 Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Design & Analysis	WR	SPAWAR : Arlington, VA	0.007	0.000		0.000		0.000		-		0.000	0.000	0.007	-
Design & Analysis	WR	ARMY : Cecom	0.066	0.000		0.000		0.000		-		0.000	0.000	0.066	-
Design & Analysis	C/FP	GENERAL DYNAMICS : Falls Church, VA	1.660	0.000		0.000		0.000		-		0.000	0.000	1.660	-
Design & Analysis	WR	VARIOUS : (IWS 1A)	89.582	15.400	Nov 2016	15.000	Nov 2017	9.455	Nov 2018	-		9.455	0.000	129.437	-
Design & Analysis	WR	VARIOUS : (VLS)	25.324	0.350	Nov 2016	0.000		0.000		-		0.000	0.000	25.674	-
Design & Analysis	WR	NSWC : WSMR	0.100	0.100	Nov 2016	0.000		0.000		-		0.000	0.000	0.200	-
Design & Analysis	WR	PMRF : Hawaii	3.106	0.000		0.700	Nov 2017	0.000		-		0.000	0.000	3.806	-
Design & Analysis	WR	DOI : Washington D.C.	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	1,014.223	62.837		72.564		34.101		-		34.101	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC : Port Hueneme	4.429	2.000	Nov 2016	1.700	Nov 2017	1.245	Nov 2018	-		1.245	0.000	9.374	-
Developmental Test & Evaluation	WR	NSWC : WSMR	26.667	0.625	Nov 2016	7.500	Nov 2017	3.175	Nov 2018	-		3.175	0.000	37.967	-
Developmental Test & Evaluation	WR	PMRF : Hawaii	41.144	1.157	Nov 2016	12.800	Nov 2017	3.000	Nov 2018	-		3.000	0.000	58.101	-
Developmental Test & Evaluation	WR	NAWC : Pt Mugu	3.991	0.200	Nov 2016	0.000		0.875	Nov 2018	-		0.875	0.000	5.066	-
Developmental Test & Evaluation	C/CPAF	RAYTHEON : Tucson, AZ	37.417	5.500	Nov 2016	6.500	Nov 2017	3.200	Nov 2018	-		3.200	0.000	52.617	-
Developmental Test & Evaluation	C/CPFF	JHU/APL : Laurel, MD	13.463	3.600	Nov 2016	0.941	Nov 2017	1.800	Nov 2018	-		1.800	0.000	19.804	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604366N / *Standard Missile Improvements*	Project (Number/Name) 3092 / *Standard Missile 6 Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC : Corona	10.376	2.600	Nov 2016	0.600	Nov 2017	2.750	Nov 2018	-		2.750	0.000	16.326	-
Developmental Test & Evaluation	WR	NSWC : Dahlgren	1.888	0.578	Nov 2016	0.300	Nov 2017	0.620	Nov 2018	-		0.620	0.000	3.386	-
Developmental Test & Evaluation	WR	VLS : Arlington, VA	2.369	0.000		0.000		0.000		-		0.000	0.000	2.369	-
Developmental Test & Evaluation	WR	COMPTEVFOR : Norfolk, Va	1.514	0.150	Nov 2016	0.225	Nov 2017	0.230	Nov 2018	-		0.230	0.000	2.119	-
Developmental Test & Evaluation	WR	VARIOUS : (IWS 1A)	3.082	0.700	Nov 2016	0.500	Nov 2017	0.000		-		0.000	0.000	4.282	-
Developmental Test & Evaluation	WR	NSWC : Carderock	2.280	0.000		0.100	Nov 2017	0.200	Nov 2018	-		0.200	0.000	2.580	-
Developmental Test & Evaluation	WR	NAWC : China Lake	0.194	4.924	Nov 2016	0.480	Nov 2017	0.000		-		0.000	0.000	5.598	-
Developmental Test & Evaluation	WR	ONR : Arlington, Va	1.854	1.571	Nov 2016	0.000		0.000		-		0.000	0.000	3.425	-
Developmental Test & Evaluation	WR	DOI : Washington D.C.	0.545	0.000		0.000		0.000		-		0.000	0.000	0.545	-
		Subtotal	151.213	23.605		31.646		17.095		-		17.095	0.000	223.559	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Services	C/CPAF	VARIOUS : Various	32.193	4.050	Nov 2016	4.117	Nov 2017	4.504	Nov 2018	-		4.504	0.000	44.864	-
Travel	Various	IWS3 : Arlington, VA	1.352	0.063	Nov 2016	0.063	Nov 2017	0.123	Nov 2018	-		0.123	0.000	1.601	-
DAWDF	C/FP	Not Specified : Not Specified	1.130	0.000		0.000		0.000		-		0.000	0.000	1.130	-
		Subtotal	34.675	4.113		4.180		4.627		-		4.627	0.000	47.595	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604366N / *Standard Missile Improvements*	Project (Number/Name) 3092 / *Standard Missile 6 Program*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,200.111	90.555		108.390		55.823		-		55.823	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 3092 / *Standard Missile 6 Program*

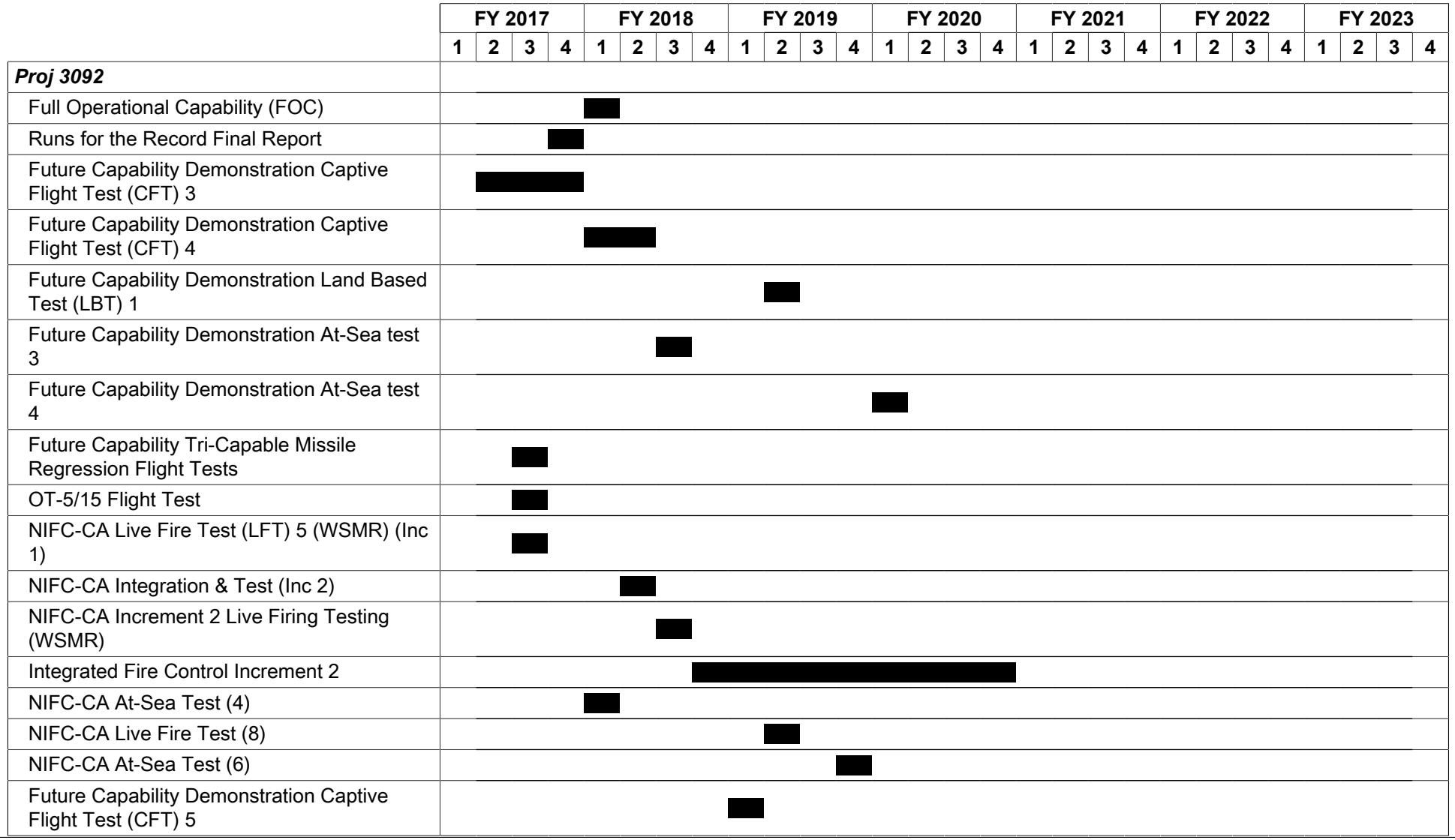

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 3092 / *Standard Missile 6 Program*

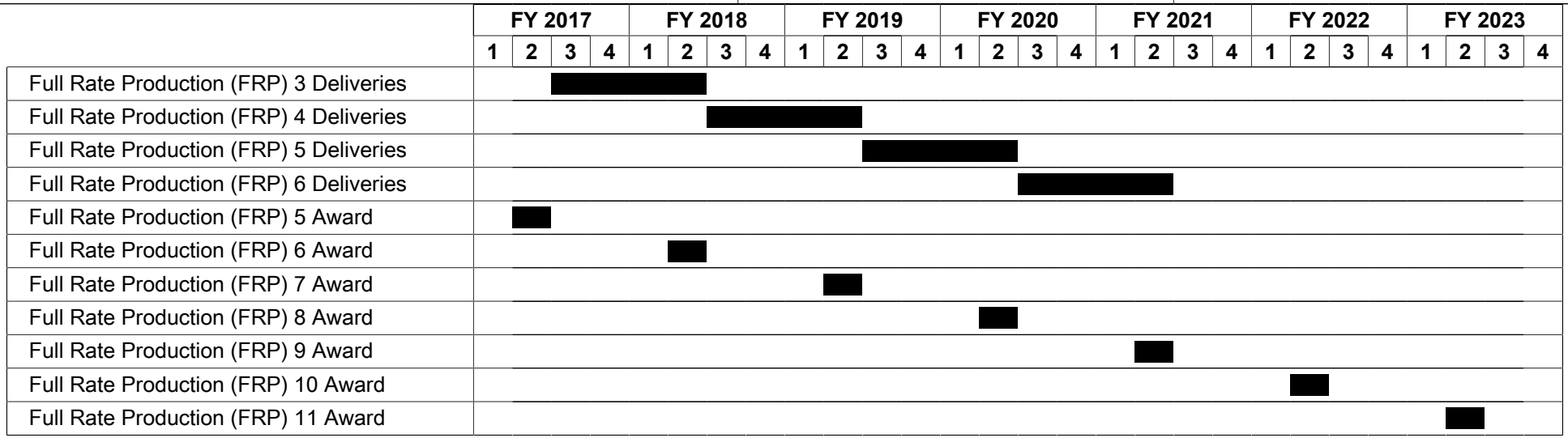

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 3092 / *Standard Missile 6 Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3092				
Full Operational Capability (FOC)	1	2018	1	2018
Runs for the Record Final Report	4	2017	4	2017
Future Capability Demonstration Captive Flight Test (CFT) 3	2	2017	4	2017
Future Capability Demonstration Captive Flight Test (CFT) 4	1	2018	2	2018
Future Capability Demonstration Land Based Test (LBT) 1	2	2019	2	2019
Future Capability Demonstration At-Sea test 3	3	2018	3	2018
Future Capability Demonstration At-Sea test 4	1	2020	1	2020
Future Capability Tri-Capable Missile Regression Flight Tests	3	2017	3	2017
OT-5/15 Flight Test	3	2017	3	2017
NIFC-CA Live Fire Test (LFT) 5 (WSMR) (Inc 1)	3	2017	3	2017
NIFC-CA Integration & Test (Inc 2)	2	2018	2	2018
NIFC-CA Increment 2 Live Firing Testing (WSMR)	3	2018	3	2018
Integrated Fire Control Increment 2	4	2018	4	2020
NIFC-CA At-Sea Test (4)	1	2018	1	2018
NIFC-CA Live Fire Test (8)	2	2019	2	2019
NIFC-CA At-Sea Test (6)	4	2019	4	2019
Future Capability Demonstration Captive Flight Test (CFT) 5	1	2019	1	2019
Full Rate Production (FRP) 3 Deliveries	3	2017	2	2018
Full Rate Production (FRP) 4 Deliveries	3	2018	2	2019
Full Rate Production (FRP) 5 Deliveries	3	2019	2	2020
Full Rate Production (FRP) 6 Deliveries	3	2020	2	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604366N / *Standard Missile Improvements*	**Project (Number/Name)** 3092 / *Standard Missile 6 Program*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Full Rate Production (FRP) 5 Award	2	2017	2	2017
Full Rate Production (FRP) 6 Award	2	2018	2	2018
Full Rate Production (FRP) 7 Award	2	2019	2	2019
Full Rate Production (FRP) 8 Award	2	2020	2	2020
Full Rate Production (FRP) 9 Award	2	2021	2	2021
Full Rate Production (FRP) 10 Award	2	2022	2	2022
Full Rate Production (FRP) 11 Award	2	2023	2	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604373N *I Airborne Mine Countermeasures (AMCM)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	394.591	44.930	15.734	10.831	-	10.831	10.916	10.916	11.099	11.328	Continuing	Continuing
2047: *ALMDS*	201.178	18.343	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	219.521
2473: *Airborne Mine Neutralization System*	154.275	13.646	3.481	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	171.402
4026: *Strat Into Medal, Tactics & Trng Organic Force*	33.343	11.624	10.994	9.919	-	9.919	9.984	9.963	10.127	10.336	Continuing	Continuing
9179: *Surf Navy Integ Undersea Tactical Tech*	5.795	1.317	1.259	0.912	-	0.912	0.932	0.953	0.972	0.992	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element provides resources to develop advanced mine countermeasures equipment systems to counter known and projected mine threats. The mine countermeasures systems provide mobile, quick reaction forces capable of land or sea-based minehunting and minesweeping operations worldwide. Resources are for developing and deploying advanced mine-hunting systems and the intelligence and oceanographic capabilities that will enable mine warfare superiority. Tactics and techniques used vary across a diversity of environments and threats, including both asymmetric and emerging. Resources provide for systems and support of mine warfare systems, maritime systems, and expeditionary systems to allow for continuous operations of the Navy's warships and support vessels, other military vessels, and commercial vessels. Core capabilities include forward presence, deterrence, sea control, power projection, maritime security, humanitarian assistance and disaster response to maintain freedom of the seas. Capability improvements include conducting minefield reconnaissance (mine density and location) at high area search rates, improving detection capability, decreasing sensor false alarm rates, reducing or eliminating post-mission analysis detect, classify, identify, decision time, improving neutralization time, improving network communications, automatic target recognition, and achieving in-stride detect-to-engage capability. Concept of operations includes development of cooperative, unmanned, modular systems; the establishment of capable networked command and control systems; and standing up an accurate and interactive environmental system with the ability to form and disseminate a Common Environmental Picture. Other areas of importance include search and rescue; surface fire support; ASW operations; protection/offense against small craft/vehicles; air to air operations; very shallow water MCM; swimmer defense and torpedo defense. Efforts benefit the MCM force by transforming the Navy from the platform-centered legacy set of systems to a capability-centered force that is distributed, networked, and able to provide unique maritime influence and access across the entire maritime domain.

The Airborne Mine Countermeasures (AMCM) programs will provide detection, classification, localization, identification, neutralization, and influence sweep capabilities. This capability will be of critical importance in littoral zones, confined straits, choke points, and the Amphibious Objective Area (AOA).

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604373N *I Airborne Mine Countermeasures (AMCM)*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	45.622	15.734	11.031	-	11.031
Current President's Budget	44.930	15.734	10.831	-	10.831
Total Adjustments	-0.692	0.000	-0.200	-	-0.200
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.692	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.200	-	-0.200

Change Summary Explanation

FY19 -$200K Total Adjustments: -$200k economic assumptions reduction

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 2047 / *ALMDS*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2047: *ALMDS*	201.178	18.343	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	219.521
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Airborne Laser Mine Detection System (ALMDS), designation AN/AES-1, is a light detection and ranging (LIDAR) Airborne Mine Countermeasures (AMCM) high area coverage system that detects, classifies, and localizes near-surface moored sea mines. The system is deployed from the MH-60S helicopter and will provide Organic Airborne Mine Countermeasures (OAMCM) defense to the battle force. The system represents a capability that does not exist in the current Mine Countermeasures (MCM) inventory.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Hardware and Software technology development and demonstration/Engineering Services:	9.612	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Engineering, oversight, and support of engineering efforts to meet baseline performance and P3I performance.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: No change from PB18 to PB19.					
Title: Integrated Logistics Support:	1.035	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2047 / *ALMDS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No change from PB18 to PB19.					
Title: Testing and Evaluation: ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No change from PB18 to PB19.	7.495 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Project Management: ***Articles:*** ***Description:*** Completion of OA ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No change from PB18 to PB19.	0.201 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	18.343	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2047 / *ALMDS*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN 4248: *Aviation Mine Countermeasures*	27.542	20.605	11.299	-	11.299	19.250	6.732	4.536	4.629	0.000	544.060
• OPN 1601: *LCS MCM Mission Modules*	29.724	55.870	124.147	-	124.147	204.324	245.108	227.068	234.109	1,421.551	2,691.282

Remarks

The above funding lines account for several programs, of which ALMDS is only a portion.

D. Acquisition Strategy

The program entered Production and Development Acquisition Phase following MS C in May 2005. August 2007 program authorized to meet full performance in two increments. The first LRIP lot was awarded as a new sole-source contract to the SD&D contractor in FY05. FRP will be based on Increment 1 performance. In FY14 a new competitive FFP production contract was awarded. This is a Fixed-Price Incentive (FPI) contract with cost and schedule incentives.

E. Performance Metrics

Conducted Operational Assessment (OA) Phase A in FY12. Conducted OA Phase B, Environmental Qualification Test (EQT), and Equipment Qualifications Test in FY14. Completed OA Phase B and DT phase 4 period 2 in FY14/15. Completed Mine Countermeasures Mission Package (MCM MP) TECHEVAL in FY15. Achieved IOC in FY17.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2047 / *ALMDS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware/Software Development	WR	NSWC PC : Panama City FL	3.313	0.053	Oct 2016	0.000		0.000		-		0.000	0.000	3.366	-
Hardware/Software Development	C/CPAF	Northrop Grumman : Melbourne, FL	41.223	2.268	May 2017	0.000		0.000		-		0.000	0.000	43.491	-
Hardware/Software Development	WR	NUWC NPT : RI	1.914	0.388	Nov 2016	0.000		0.000		-		0.000	0.000	2.302	-
Hardware/Software Development	WR	NSWC IH : MD	1.159	0.500	Oct 2016	0.000		0.000		-		0.000	0.000	1.659	-
Engineering Services1	WR	NSWC PC : Panama City FL	20.038	1.510	Nov 2016	0.000		0.000		-		0.000	0.000	21.548	-
Engineering Services2	C/CPAF	Northrop Grumman : Melbourne, Fl	26.139	0.872	Feb 2017	0.000		0.000		-		0.000	0.000	27.011	-
Engineering Services3	WR	NUWC NPT : RI	21.131	0.735	Oct 2016	0.000		0.000		-		0.000	0.000	21.866	-
Engineering Services4	MIPR	Various : Various	5.996	2.016	Nov 2016	0.000		0.000		-		0.000	0.000	8.012	-
Engineering Services5	MIPR	Various : Various	3.212	1.270	Nov 2016	0.000		0.000		-		0.000	0.000	4.482	-
		Subtotal	124.125	9.612		0.000		0.000		-		0.000	0.000	133.737	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ILS Functions1	WR	NSWC PC : Panama City FL	5.794	0.626	Dec 2016	0.000		0.000		-		0.000	0.000	6.420	-
ILS Functions2	WR	Northrop Grumman : Melbourne FL	8.286	0.409	May 2017	0.000		0.000		-		0.000	0.000	8.695	-
ILS Functions3	C/CPAF	Various/NRL Stennis : Various	1.062	0.000		0.000		0.000		-		0.000	0.000	1.062	-
ILS Functions4	WR	NSWC PC : Panama City FL	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
		Subtotal	15.442	1.035		0.000		0.000		-		0.000	0.000	16.477	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2047 / *ALMDS*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing and Evaluation1	C/CPAF	Northrp Grumman : Melbourne FL	17.604	0.634	May 2017	0.000		0.000		-		0.000	0.000	18.238	-
Testing and Evaluation2	WR	NSWC PC : Panama City FL	25.962	6.130	May 2017	0.000		0.000		-		0.000	0.000	32.092	-
Testing and Evaluation	C/CPAF	Various : Various	3.084	0.000		0.000		0.000		-		0.000	0.000	3.084	-
Testing and Evaluation	WR	NAWC AD PAX : Panama City FL	2.110	0.731	Jan 2017	0.000		0.000		-		0.000	0.000	2.841	-
		Subtotal	48.760	7.495		0.000		0.000		-		0.000	0.000	56.255	N/A

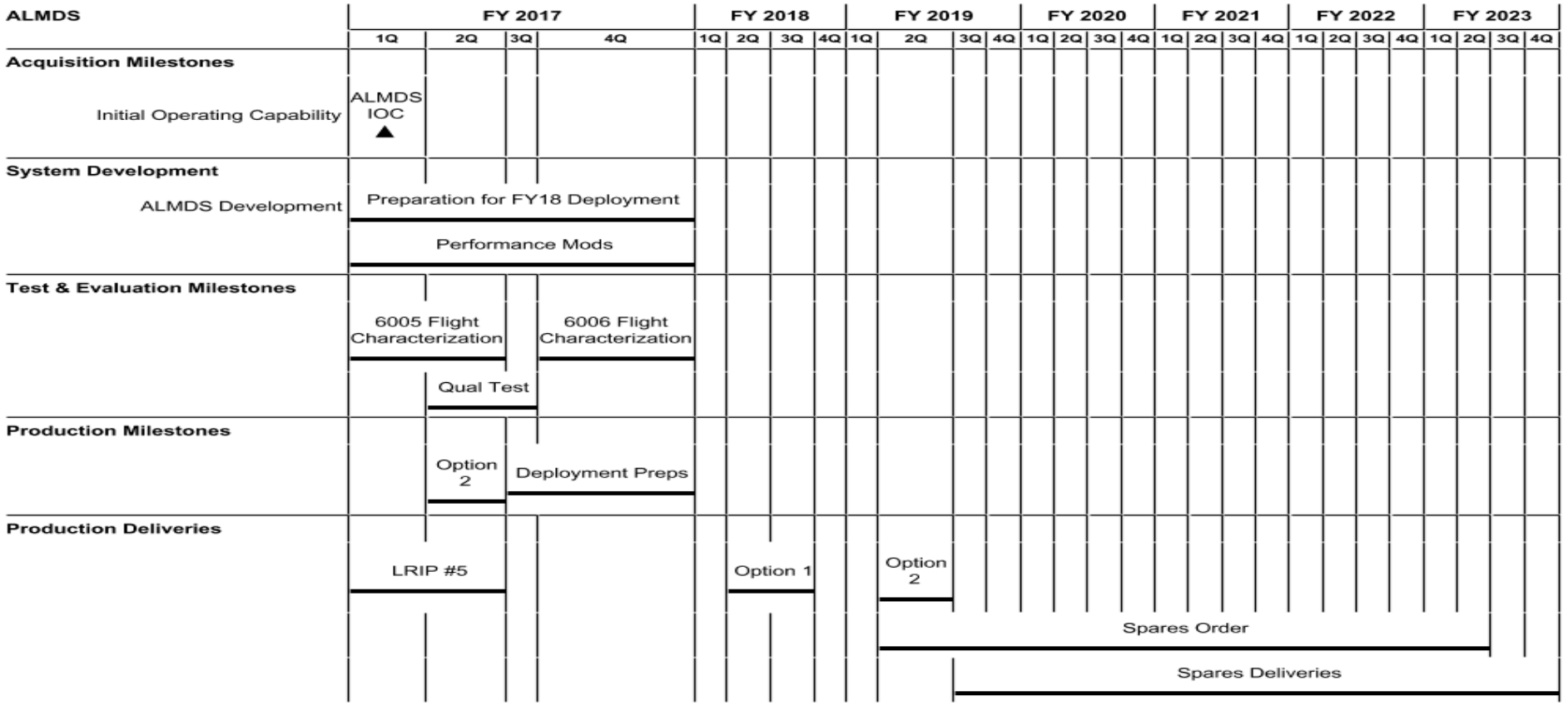
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support1	C/CPAF	NGC : Various	2.798	0.000		0.000		0.000		-		0.000	0.000	2.798	-
Management Support2	WR	NSWC PC : Panama City FL	7.191	0.201	Jan 2017	0.000		0.000		-		0.000	0.000	7.392	-
Management Support3	WR	ARINC : Panama City FL	2.782	0.000		0.000		0.000		-		0.000	0.000	2.782	-
DAWDF	Various	Various : Various	0.080	0.000		0.000		0.000		-		0.000	0.000	0.080	-
		Subtotal	12.851	0.201		0.000		0.000		-		0.000	0.000	13.052	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	201.178	18.343		0.000		0.000		-		0.000	0.000	219.521	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2047 / *ALMDS*



2019DON - 0604373N - 2047

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2047 / *ALMDS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ALMDS				
Acquisition Milestones: Initial Operating Capability: IOC	1	2017	1	2017
System Development: ALMDS Development: Preparation for FY18 Deployment	1	2017	4	2017
System Development: ALMDS Development: Performance modifications in support of FY18 employment Configuration	1	2017	4	2017
Test & Evaluation Milestones: Software Build 6005	1	2017	2	2017
Test & Evaluation Milestones: Software Build 6006	4	2017	4	2017
Test & Evaluation Milestones: Shipping Container	2	2017	3	2017
Production Milestones: FY18 Deployment Preparations	3	2017	4	2017
Production Milestones: Production Start 2	2	2017	2	2017
Production Deliveries: LRIP 5 Units Deliveries	1	2017	2	2017
Production Deliveries: Option 1 Deliveries	2	2018	3	2018
Production Deliveries: Option 2 Deliveries	2	2019	2	2019
Production Deliveries: ALMDS Spares: Order	2	2019	2	2023
Production Deliveries: ALMDS Spares Delivery	3	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 2473 / *Airborne Mine Neutralization System*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2473: *Airborne Mine Neutralization System*	154.275	13.646	3.481	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	171.402
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Airborne Mine Neutralization System (AMNS) is deployed from the MH-60S and MH-53E helicopters.

The AMNS (Archerfish) will be deployed from the MH-60S helicopter with the capability to neutralize bottom and moored mines using an expendable mine neutralization device. These systems will provide organic airborne mine neutralization capability which will be of critical importance in littoral zones, confined straits, choke points and the Amphibious Objective Area (AOA).

The Barracuda program provides an expendable, low cost, and unmanned mine neutralization capability against previously located near-surface mines with the potential to address other targets. Barracuda is a mine neutralization system with the form factor of an A-size sonobuoy. It is a modular weapon that will be stored and assembled on LCS, will be deployed from the Mine Countermeasure Unmanned Surface Vehicle (MCM USV), and will maintain communications with the operator on LCS while autonomously re-acquiring mines in the near surface and await a fire command from the operator on board LCS.

An Analysis of Alternatives (AoA) was conducted in June 2015 to address the unmet near surface requirements, several systems were considered and Barracuda was selected. The Naval Capabilities Board (NCB) approved the AoA results for the Gate 2 decision in July 2015. The NCB endorsed the Barracuda Capabilities Development Document (CDD) for the Gate 3 decision in April 2016; CDD was approved in September 2016.

The Barracuda baseline capability is transitioned from the Office of Naval Research (ONR) Single Sortie Detect-To-Engage (SS DTE) Future Naval Capability (FNC). Barracuda provides the only near surface mine neutralization system that will allow the Littoral Combat Ship (LCS) Mine Countermeasure (MCM) Mission Package (MP) to fully meet its two minehunting performance requirements. Initial Barracuda deployment will be on the MCM USV as part of the LCS MCM MP. Subsequent plans are to expand potential means of providing in-stride MCM capabilities and transitioning follow-on FNCs from ONR. Barracuda may be hosted by an LCS, Expeditionary Mobile Base (ESB), or shore facility.

Funding for Barracuda was realigned to 0603502N, project 2928 beginning in FY18.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AMNS: Development/Engineering Support	5.484	3.181	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2473 / *Airborne Mine Neutralization System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Provide engineering support, including review for product development and integration. Develop logistics products, including training materials and interactive technical manuals. Provide engineering support for upgrade development and develop associated logistics products. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The AMNS program has achieved IOC and has transitioned to operations and sustainment funding.					
Title: AMNS: Test and Evaluation	0.500	0.138	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to conduct AMNS ECP upgrade tests. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The AMNS program has achieved IOC, therefore has transitioned to operations and sustainment.					
Title: Barracuda: Product Development	5.450	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Funding realigned to 0603502N, project 2928 beginning in FY18. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2473 / *Airborne Mine Neutralization System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
Title: AMNS: Management Services	0.305	0.162	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Provide program management support, contract management and travel for AMNS.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The AMNS program has achieved IOC, therefore has transitioned to operations and sustainment.					
Title: Barracuda: Engineering Support	1.261	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Funding realigned to 0603502N, project 2928 beginning in FY18.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
Title: Barracuda: Management Services	0.646	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Funding realigned to 0603502N, project 2928 beginning in FY18.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2473 / *Airborne Mine Neutralization System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
Accomplishments/Planned Programs Subtotals	13.646	3.481	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN 4248: *Aviation Mine Countermeasures*	27.542	20.605	11.299	-	11.299	19.250	6.732	4.536	4.629	0.000	544.060
• WPN 4225: *Airborne Mine Neutralization Systems*	13.753	16.925	22.249	-	22.249	14.082	14.308	14.747	12.705	Continuing	Continuing
• OPN 1601: *LCS MCM Mission Modules*	29.724	55.870	124.147	-	124.147	204.324	245.108	227.068	234.109	1,421.551	2,691.282

Remarks

The above funding lines account for several programs, of which AMNS is only a portion.

D. Acquisition Strategy

AMNS: The Navy has successfully completed Developmental Testing (Inert) on MH-60S, and conducted TECHEVAL tests on LCS with the MH-60S. The Navy has awarded a sole source contract to BAE for neutralizer procurements (WPN) to accompany the Launch and Handling Systems (LHS).
Barracuda: Transition ONR FNC SS DTE to Barracuda in FY17 and FY18 following the same approach to design a low cost modular neutralizer that leverages economies of scale and reduces total ownership cost. Release the Barracuda RFP in 3QFY17. Achieve Milestone B in 2QFY18. Award a cost plus incentive fee base contract to design and deliver 750 Engineering Development Models (EDMs) with two cost plus fixed fee Low Rate Initial Production (LRIP) options to manufacture and deliver 1000 Barracudas per option. Base award will occur in 3QFY18. LRIP option #1 planned to be exercised in FY25 and LRIP option #2 in FY26. Manage the production cost model throughout the detailed design effort to deliver a low cost design in the Technical Data Package (TDP). There will be Government Purpose Rights on the TDP that will enable release of the TDP for a full and open competition of the Full Rate Production (FRP) contract planned in FY27. Initial Operating Capability (IOC) planned for 4QFY25.

E. Performance Metrics

AMNS:Successful completion of Testing and IOC was achieved in November 2016.
Barracuda: Efficient design, fabrication, and testing to deliver a low cost solution that achieves required probability of kill against near surface mines.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 2473 / *Airborne Mine Neutralization System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMNS Hardware/Software Development	Various	Various : Various	3.359	0.000		0.000		0.000		-		0.000	0.000	3.359	-
AMNS Hardware/Software Development	WR	NSWC PC : Panama City, FL	9.558	2.311	Nov 2016	1.428	Oct 2017	0.000		-		0.000	0.000	13.297	-
AMNS Hardware/Software Development	C/CPAF	Raytheon : Portsmouth, RI	28.507	3.173	Apr 2017	1.753	Nov 2017	0.000		-		0.000	0.000	33.433	-
AMNS Hardware/Software Development	SS/CPIF	Lockheed Martin : Syracuse, NY	3.331	0.000		0.000		0.000		-		0.000	0.000	3.331	-
Barracuda Hardware/ Software Development	WR	NSWC PC : Panama City, FL	0.000	2.560	May 2017	0.000		0.000		-		0.000	0.000	2.560	Continuing
Barracuda Hardware/ Software Development	WR	NSWC PC : Indian Head, MD	0.000	1.368	Nov 2016	0.000		0.000		-		0.000	0.000	1.368	Continuing
Barracuda Hardware/ Software Development	C/CPIF	JHU APL : Baltimore, MD	0.000	1.522	Nov 2016	0.000		0.000		-		0.000	0.000	1.522	Continuing
(Near Surface) Hardware/ Software Development	WR	NUWC, NPT : Newport, RI	6.691	0.000		0.000		0.000		-		0.000	0.000	6.691	-
(Near Surface) Hardware/ Software Development	C/CPIF	Raytheon : Portsmouth, RI	4.033	0.000		0.000		0.000		-		0.000	0.000	4.033	-
		Subtotal	55.479	10.934		3.181		0.000		-		0.000	0.000	69.594	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Engineering Support	WR	NUWC NPT : Newport RI	0.000	0.464	Nov 2016	0.000		0.000		-		0.000	0.000	0.464	-
Barracuda Engineering Services	C/CPIF	JHU APL : Baltimore, MD	0.000	0.300	Nov 2016	0.000		0.000		-		0.000	0.000	0.300	-
Barracuda T&E Support	WR	NUWC NPT : Newport RI	0.000	0.190	May 2017	0.000		0.000		-		0.000	0.000	0.190	-
Barracuda T&E Support	WR	NSWC IH : Indian Head, MD	0.000	0.307	Nov 2016	0.000		0.000		-		0.000	0.000	0.307	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 2473 / *Airborne Mine Neutralization System*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.000	1.261		0.000		0.000		-		0.000	0.000	1.261	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMNS Development Test & Evaluation	SS/CPFF	Lockheed Martin : Syracuse, NY	1.254	0.000		0.000		0.000		-		0.000	0.000	1.254	-
AMNS Operational Test & Evaluation	SS/CPFF	Lockheed Martin : Syracuse, NY	0.767	0.000		0.000		0.000		-		0.000	0.000	0.767	-
AMNS Test Assets	C/CPIF	Raytheon : Portsmouth, RI	3.310	0.000		0.000		0.000		-		0.000	0.000	3.310	-
AMNS Development Test & Evaluation	WR	NSWC, PC : Panama City, FL	38.166	0.125	Oct 2016	0.138	Nov 2017	0.000		-		0.000	0.000	38.429	-
AMNS Development Test & Evaluation	C/CPIF	Raytheon : Portsmouth, RI	17.168	0.375	Dec 2016	0.000		0.000		-		0.000	0.000	17.543	-
AMNS Operational Test & Evaluation	WR	COTF : Norfolk, VA	20.095	0.000		0.000		0.000		-		0.000	0.000	20.095	-
		Subtotal	80.760	0.500		0.138		0.000		-		0.000	0.000	81.398	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMNS Management Support	WR	NSWC PC : Panama City, FL	0.463	0.128	Oct 2016	0.081	Oct 2017	0.000		-		0.000	0.000	0.672	-
Barracuda Management Support	WR	NSWC PC : Panama City, FL	0.000	0.246	Oct 2016	0.000		0.000		-		0.000	0.000	0.246	-
Barracuda Program Management	WR	NUWC NPT : Newpoprt RI	0.000	0.272	May 2017	0.000		0.000		-		0.000	0.000	0.272	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 2473 / *Airborne Mine Neutralization System*	

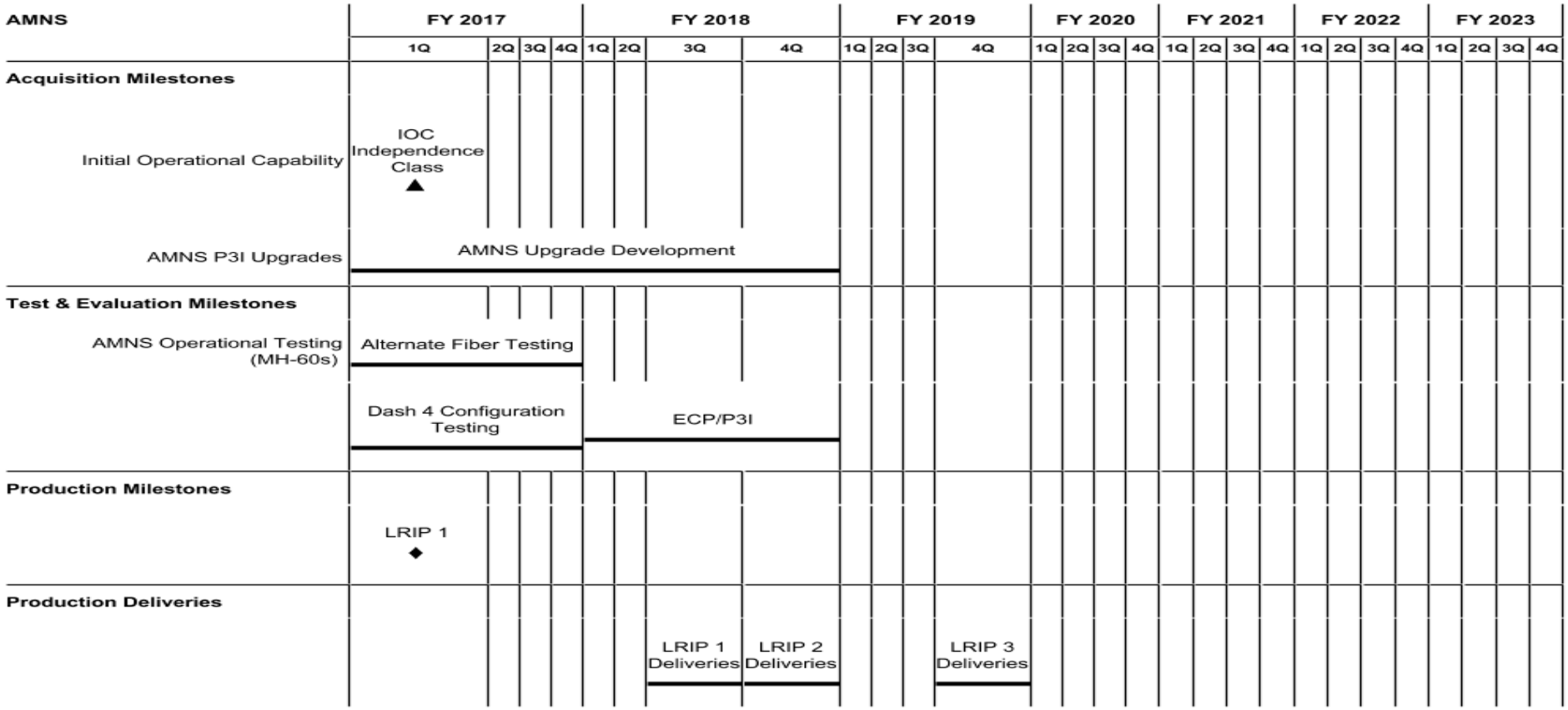
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Barracuda Engineering Support	C/CPIF	JHU APL : Baltimore, MD	0.000	0.128	May 2017	0.000		0.000		-		0.000	0.000	0.128	-
AMNS Program Management Support	C/CPFF	Various : Various	7.355	0.000		0.000		0.000		-		0.000	0.000	7.355	-
AMNS Program Management Support	C/CPIF	Raytheon : Portsmouth, RI	2.554	0.177	Jan 2017	0.081	Nov 2017	0.000		-		0.000	0.000	2.812	-
AMNS Program Management Support	Various	Field Activity : Various	2.352	0.000		0.000		0.000		-		0.000	0.000	2.352	-
AMNS Travel	Allot	NAVSEA : Washington, DC	0.159	0.000		0.000		0.000		-		0.000	0.000	0.159	-
DAWDF	Sub Allot	NAVSEA : Washington, DC	5.153	0.000		0.000		0.000		-		0.000	0.000	5.153	-
		Subtotal	18.036	0.951		0.162		0.000		-		0.000	0.000	19.149	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	154.275	13.646		3.481		0.000		-		0.000	0.000	171.402	N/A

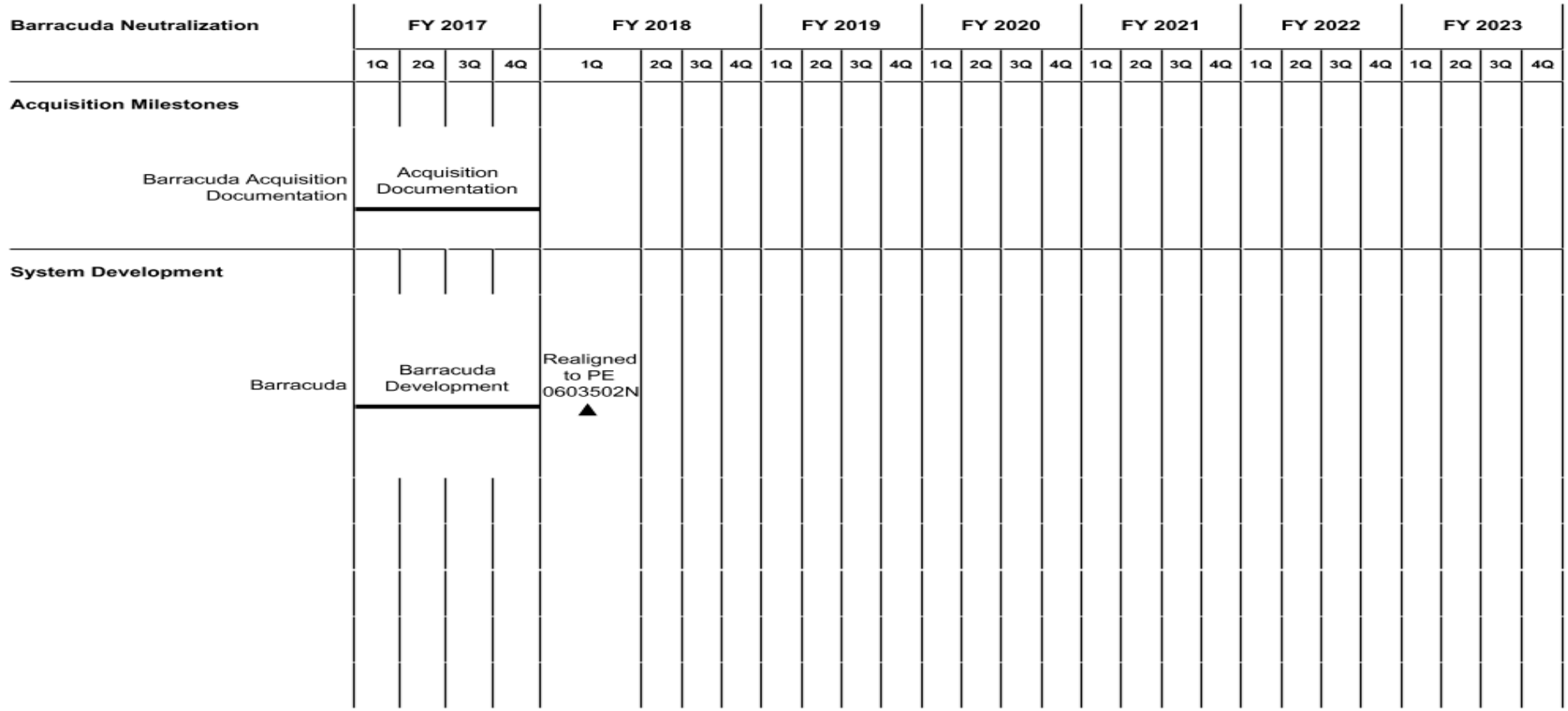
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2473 / *Airborne Mine Neutralization System*



2019DON - 0604373N - 2473

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2473 / *Airborne Mine Neutralization System*



2019DON - 0604373N - 2473

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 2473 / *Airborne Mine Neutralization System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AMNS				
Acquisition Milestones: Initial Operational Capability: Initial Operational Capability	1	2017	1	2017
Acquisition Milestones: AMNS Upgrades: AMNS Upgrade Development	1	2017	4	2018
Test & Evaluation Milestones: AMNS Operational Testing (MH-60s): Alternate Fiber Testing	1	2017	4	2017
Test & Evaluation Milestones: AMNS Operational Testing (MH-60s): Dash 4 Configuration Testing	1	2017	4	2017
Test & Evaluation Milestones: AMNS Operational Testing (MH-60s): ECP Testing	1	2018	4	2018
Production Milestones: LRIP 1	1	2017	1	2017
Production Deliveries: LRIP 1 Delivery	3	2018	3	2018
Production Deliveries: LRIP 2 Delivery	4	2018	4	2018
Production Deliveries: LRIP 3 Delivery	4	2019	4	2019
Barracuda Neutralization				
Acquisition Milestones: Barracuda Acquisition Documentation: Acquisition Documentation	1	2017	4	2017
System Development: Barracuda: Barracuda Development	1	2017	4	2017
System Development: Barracuda: Schedule Detail	1	2018	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 4026 / *Strat Into Medal, Tactics & Trng Organic Force*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
4026: *Strat Into Medal, Tactics & Trng Organic Force*	33.343	11.624	10.994	9.919	-	9.919	9.984	9.963	10.127	10.336	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The C4I, Tactics, Mission Planning (CTMP), and Post Mission Analysis (PMA) program is an initiative that has evolved into both developing MEDAL modules for each Next Generation MCM system and developing Next Generation Tactics. Additionally CTMP provides threat data and system requirements and capabilities to the MEDAL software development effort. Finally CTMP develops Net-Centric Sensor Analysis for Mine Warfare (NSAM) as an Open Systems Architecture (OSA) compliant plug-in architecture of common post-mission analysis tools for PMA of Next Generation MCM sensor data.

NSAM analysis tools will provide the capability to perform tactical and environmental Post Mission Analysis (PMA) on data collected from various MCM sensor systems. The goal is to reduce the mission timeline and increase the mission effectiveness with respect to Mission Analysis. NSAM will have a training mode to maintain operator proficiency and PMA skill set. NSAM will be the replacement for Organic Post Mission Analysis (OPMA) in the Fleet, integrating ALMDS, AMNS, AN/AQS-20 Sensor PMA into the first delivered Fleet Build. Future incremental Builds, fielding on a 12-18 month cycle, will add support for AN/AQS-24B/C, COBRA, Knifefish, MCM USV, and ExMCM UUV sensors.
NSAM provides Multi-Data Set, Multi-User, Tactical & Environmental PMA, Contact Management, and Change Detection.
OSA reduces cost for adding future MCM Systems.
The analysis results from PMA are provided to the Mine Warfare and Environmental Decisions Aid Library (MEDAL) reducing False Call reporting for tactical decision making.
NSAM will implement Cybersecurity Requirements using the new Risk Management Framework (RMF) Process.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NSAM Product Development	6.929	5.292	5.107	0.000	5.107
Articles:	-	-	-	-	-
FY 2018 Plans: Complete NSAM Open Architecture software development Increment 1 Build 1 that includes PMA support for ALMDS, AMNS, and AN/AQS-20A MCM Systems. Complete Development of Requirements for Increment 1 Build 2. Start Software Development of Build 2 address LCS capability gaps identified in the LCS IRT Plan. Continue applying Risk Management Framework (RMF) guidelines and strategy to stay on course for achieving a Platform Information Technology (PIT) Risk Approval. Continue tailoring and generating acquisition and logistics documents as required for supporting software intensive systems. Complete build requirements					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 4026 / *Strat Into Medal, Tactics & Trng Organic Force*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
definition package (BRDP) approvals for NSAM Increment 1 Build 2. Continue work on NSAM Logistics Package and Training Material. ***FY 2019 Base Plans:*** Deliver final tested NSAM Increment 1 Build 1 to LCS Mission Package Application System (MPAS) and complete NSAM Logistics Package and Training Material. Continue NSAM Build 2 Open Architecture software development to address LCS capability gaps identified in the LCS IRT Plan supporting PMA for the next series of additional MCM systems including: AN/AQS-24B/C, COBRA, Knifefish, MCM USV, and ExMCM UUV sensors. Continue applying Risk Management Framework (RMF) guidelines and strategy to address all Cybersecurity protocols. NSAM program achieves IOC in Q2 FY19 ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Engineering Services/ILS:	3.712	3.909	3.274	0.000	3.274
Articles:	-	-	-	-	-
FY 2018 Plans: Provide dedicated tactical support for integrated operations using Mission Package Application Software (MPAS) and NSAM Engineering support. Organize and execute the Integrated MCM Overarching Technical Group (IMCM OTG) to give the Fleet staffs a voice for reporting and addressing technical-level issues at the integrated level. Conduct analysis to collect information on vulnerability data available to the Fleet; define analysis that can be completed to expand the Navy Tactical Reference Publication (NTRP) 3-15.2.2 Susceptibility of Ships to Threat Mines with additional mine chapters for various Navy ships. Collaborate with MCM Division Thirty-One (MCMDIV 31) and Naval Surface and Mine Warfighting Development Center (NSMWDC) to define and document concept of employment for MCM MP with the MCM Commander (MCMC) of LCS. ***FY 2019 Base Plans:*** Continue updates for the "Susceptibility of Ships to Threat Mines," Navy Tactical Reference Publication (NTRP) 3-15.2.2: Complete chapters for additional Mines for Fleet validated ship list. Support training needs for AMNS, ALMDS and AN/AQS-20 post IOT&E and for Increment 2 of the MCM MP. Develop "Airborne Mine					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 4026 / *Strat Into Medal, Tactics & Trng Organic Force*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Countermeasures (AMCM) (U) Navy Tactics, Training and Procedure (NTTP) Volume II, 3.15.22". Investigate and document Intelligence Preparation of the Environment (IPOE) gaps in LCS Tactics. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Reduction from FY 2018 to FY 2019 due to reduced warfare center engineering services.					
Title: Test and Evaluation	0.740	1.478	1.228	0.000	1.228
Articles:	-	-	-	-	-
FY 2018 Plans: Begin Testing NSAM Build 1 to include: Usability/human system integration (HSI) testing, and initial Integration testing into the LCS Mission Package Integration Laboratory (MPIL). ***FY 2019 Base Plans:*** Complete Testing NSAM Build 1 to include: Independent Developers Test (DT). and final Integration testing in the LCS Mission Package Integration Laboratory (MPIL) post DT. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Management Support	0.243	0.315	0.310	0.000	0.310
Articles:	-	-	-	-	-
FY 2018 Plans: Provide leadership, scheduling, monitoring and reporting status of the tasks: Plan, track and report personnel, funding, and execution status of tasks to the Assistant Program Manager (APM) for schedule, costs, risks, and deliverables for program execution tracking. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 4026 / *Strat Into Medal, Tactics & Trng Organic Force*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue to provide leadership, scheduling, monitoring and reporting status of the tasks: Plan, track and report personnel, funding, and execution status of tasks to the Assistant Program Manager (APM) for schedule, costs, risks, and deliverables for program execution tracking. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Accomplishments/Planned Programs Subtotals	11.624	10.994	9.919	0.000	9.919

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Organic Post-Mission Analysis (OPMA) capability for the OAMCM systems was developed by NSWC PCD, Panama City, FL. OMN funding will be used to purchase COTS ruggedized portable OPMA computers for LCS MCM Mission Package, ship of opportunity deployments, land basing, and training. NSWC-PCD has awarded contract for this Technical Refresh procurement with option years extending until FY18. NSAM will merge capabilities of OPMA and NAVO's Environmental PMA (EPMA) capabilities into an Open Architecture framework. Increment Build One will utilize government teams NSWC PCD and NRL-SSC to expedite fielding significant contact management improvements, data fusion techniques, and environmental PMA.

The tactics development, tactics training, and tactics algorithms/database efforts are performed by NSWC-PCD. These efforts will provide reach back support as the OAMCM systems begin to be fielded; will develop modifications to environmental databases necessary to support OAMCM mission planning; will update the MIW Tactics Continuum to address OAMCM; and will update the gear and mine database for threats addressed by the OAMCM systems.

E. Performance Metrics

Successfully integrate NSAM into LCS Mission Package and provide Training Material to AMCM Detachments. Deliver Mine Warfare Naval Tactical Publications and TACMEMOs to NWDC in near publication ready formats in support of MCM Staffs and LCS MCM MP Operators.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 4026 / *Strat Into Medal, Tactics & Trng Organic Force*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Software Development	WR	NSWC PCD : Panama City FL	19.434	5.609	Oct 2016	4.284	Oct 2017	4.201	Nov 2018	-		4.201	Continuing	Continuing	Continuing
Hardware/Software Development	WR	NRL-SSC : Bay St. Louis, MS	1.123	1.320	May 2017	1.008	Dec 2017	0.906	Dec 2018	-		0.906	Continuing	Continuing	Continuing
		Subtotal	20.557	6.929		5.292		5.107		-		5.107	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Services	WR	SSC-PAC : Various	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	-
Engineering Services	WR	NSWC PCD : Panama City FL	8.690	3.049	May 2017	2.890	Nov 2017	2.093	Nov 2018	-		2.093	Continuing	Continuing	Continuing
Engineering Services	WR	NRL-SSC : Bay St. Louis, MS	0.594	0.250	May 2017	0.238	Dec 2017	0.327	Dec 2018	-		0.327	Continuing	Continuing	Continuing
ILS	WR	NSWC PC : Panama City FL	1.745	0.413	May 2017	0.781	Nov 2017	0.854	Nov 2018	-		0.854	Continuing	Continuing	Continuing
		Subtotal	11.069	3.712		3.909		3.274		-		3.274	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NSAM Test and Evaluation	WR	NSWC PC : Panama City, FL	0.000	0.612	Oct 2016	1.054	Oct 2017	1.106	Nov 2018	-		1.106	0.000	2.772	-
NSAM Test and Evaluation	WR	NRL-SSC : Bay St Louis, MS	0.000	0.128	Nov 2016	0.424	Nov 2017	0.122	Dec 2018	-		0.122	0.000	0.674	-
		Subtotal	0.000	0.740		1.478		1.228		-		1.228	0.000	3.446	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 4026 / *Strat Into Medal, Tactics & Trng Organic Force*	

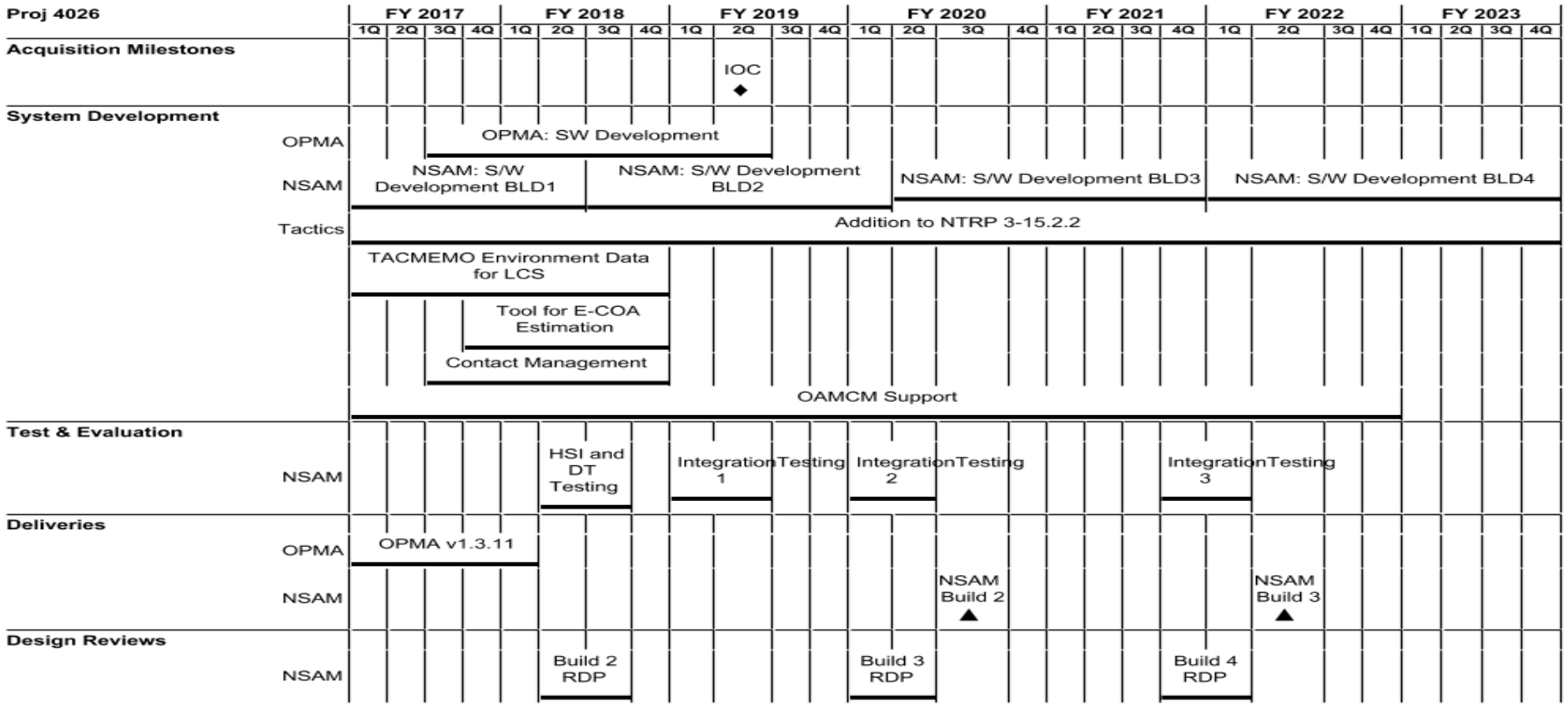
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support	WR	NSWC PC : Panama City FL	1.704	0.243	May 2017	0.315	Nov 2017	0.310	Nov 2018	-		0.310	Continuing	Continuing	Continuing
Acquisition Workforce Fund	Various	Various : Various	0.013	0.000		0.000		0.000		-		0.000	0.000	0.013	-
		Subtotal	1.717	0.243		0.315		0.310		-		0.310	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	33.343	11.624		10.994		9.919		-		9.919	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 4026 / *Strat Into Medal, Tactics & Trng Organic Force*



2019DON - 0604373N - 4026

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 4026 / *Strat Into Medal, Tactics & Trng Organic Force*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4026				
Acquisition Milestones: NSAM: Initial Operational Capability	2	2019	2	2019
System Development: OPMA: OPMA: Ongoing Development post Deployment; Software	3	2017	2	2019
System Development: NSAM: NSAM: S/W Development Increment 1 Build 1	1	2017	2	2018
System Development: NSAM: NSAM: S/W Development Increment 1 Build 2	3	2018	1	2020
System Development: NSAM: NSAM: S/W Development Increment 1 Build 3	2	2020	4	2021
System Development: NSAM: NSAM: S/W Development Increment 1 Build 4	1	2022	4	2023
System Development: Tactics: Add additional Mines to NTRP 3-15.2.2 Susceptibility of Ships to Threat Mines	1	2017	4	2023
System Development: Tactics: Tactics: TACMEMO Environment Data for LCS MCM Systems	1	2017	4	2018
System Development: Tactics: Tactics: Decision Making Tool for E-COA Estimation	4	2017	4	2018
System Development: Tactics: Tactics: Contact Management for Clearance Operations and Multi-Ship Employment	3	2017	4	2018
System Development: Tactics: Tactics: Reachback LCS OAMCM support	1	2017	4	2022
Test & Evaluation: NSAM: NSAM: LCS MCMM MP MPCE Integration Testing 1	1	2019	2	2019
Test & Evaluation: NSAM: NSAM: LCS MCMM MP MPCE Integration Testing 2	1	2020	2	2020
Test & Evaluation: NSAM: NSAM: LCS MCMM MP MPCE Integration Testing 3	4	2021	1	2022
Test & Evaluation: NSAM: NSAM: Human Systems Integration (HSI) and DT Testing	2	2018	3	2018
Deliveries: OPMA: OPMA: Deliver OPMA v1.3.11 for FY18 LCS Employment	1	2017	1	2018
Deliveries: NSAM: NSAM: Capability Drop Build 2	3	2020	3	2020
Deliveries: NSAM: NSAM: Capability Drop Build 3	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 4026 / *Strat Into Medal, Tactics & Trng Organic Force*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Design Reviews: NSAM: NSAM: Build 2 Requirements Design Package (RDP)	2	2018	3	2018
Design Reviews: NSAM: NSAM: Build 3 Requirements Design Package (RDP)	1	2020	2	2020
Design Reviews: NSAM: NSAM: Build 4 Requirements Design Package (RDP)	4	2021	1	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	Project (Number/Name) 9179 / *Surf Navy Integ Undersea Tactical Tech*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9179: *Surf Navy Integ Undersea Tactical Tech*	5.795	1.317	1.259	0.912	-	0.912	0.932	0.953	0.972	0.992	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Surface Navy Integrated Undersea Tactical Technology (SNIUTT) will be used to develop an AN/SQQ-32, and AN/AQS-24B/C sensor training modules. SNIUTT is also used for LCS MCM Mission Package Airborne Mine Countermeasures (AMCM) sensor training modules for systems such as AMNS, ALMDS, COBRA and surface towed AN/AQS-20A sensor training modules.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Engineering and Integration and Logistics Services	0.136	0.245	0.093	0.000	0.093
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to provide SNIUTT In Service Engineering Agent (ISEA) training, and documentation support.					
FY 2019 Base Plans: Continue to provide SNIUTT In Service Engineering Agent (ISEA) training, and documentation support.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease from FY18 to FY19 due to rate adjustments.					
Title: Hardware and Software Development	1.181	1.014	0.819	0.000	0.819
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to update the AN/AQS-24, AN/AQS-20A and ALMDS sonar training module. Continue development of a Scenario Generator software system for COBRA for mine field recognition training.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 9179 / *Surf Navy Integ Undersea Tactical Tech*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete update to the AN/AQS-24, AN/AQS-20A and ALMDS sonar training module. Continue development of a Scenario Generator software system for COBRA for mine field recognition training. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY18 to FY19 due to rate adjustments.					
Accomplishments/Planned Programs Subtotals	1.317	1.259	0.912	0.000	0.912

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Surface Navy Integrated Undersea Tactical Technology(SNIUTT) has been used to develop AN/SQQ-32, AN/AQS-24 and AN/AQS-20A sensor training modules. Funds will continue to support training for these sonar systems, as well as training for the Remote Environmental Measuring Units (REMUS) sonar systems and other OAMCM systems such as AMNS, ALMDS and COBRA in the same format as previous training. The SNIUTT sensor training modules will be developed by NSWC PCD, Panama City, FL,. Funds are being provided for development and delivery of refresher scenario based contact recognition training, and the update and modification of contact recognition training (interactive web based training and proficiency focused stand-alone training) in support of the SNIUTT program.

E. Performance Metrics

Successfully integrate SNIUTT into the school house training facility and provide to AMCM detachments for refresher training.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 9179 / *Surf Navy Integ Undersea Tactical Tech*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Software Development	WR	NSWC PC : Panama City FL	4.907	1.181	Jun 2017	1.014	Nov 2017	0.819	Nov 2018	-		0.819	Continuing	Continuing	Continuing
		Subtotal	4.907	1.181		1.014		0.819		-		0.819	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ISEA	WR	NSWC, PC : Panama City FL	0.885	0.136	Oct 2016	0.245	Nov 2017	0.093	Nov 2018	-		0.093	Continuing	Continuing	Continuing
		Subtotal	0.885	0.136		0.245		0.093		-		0.093	Continuing	Continuing	N/A

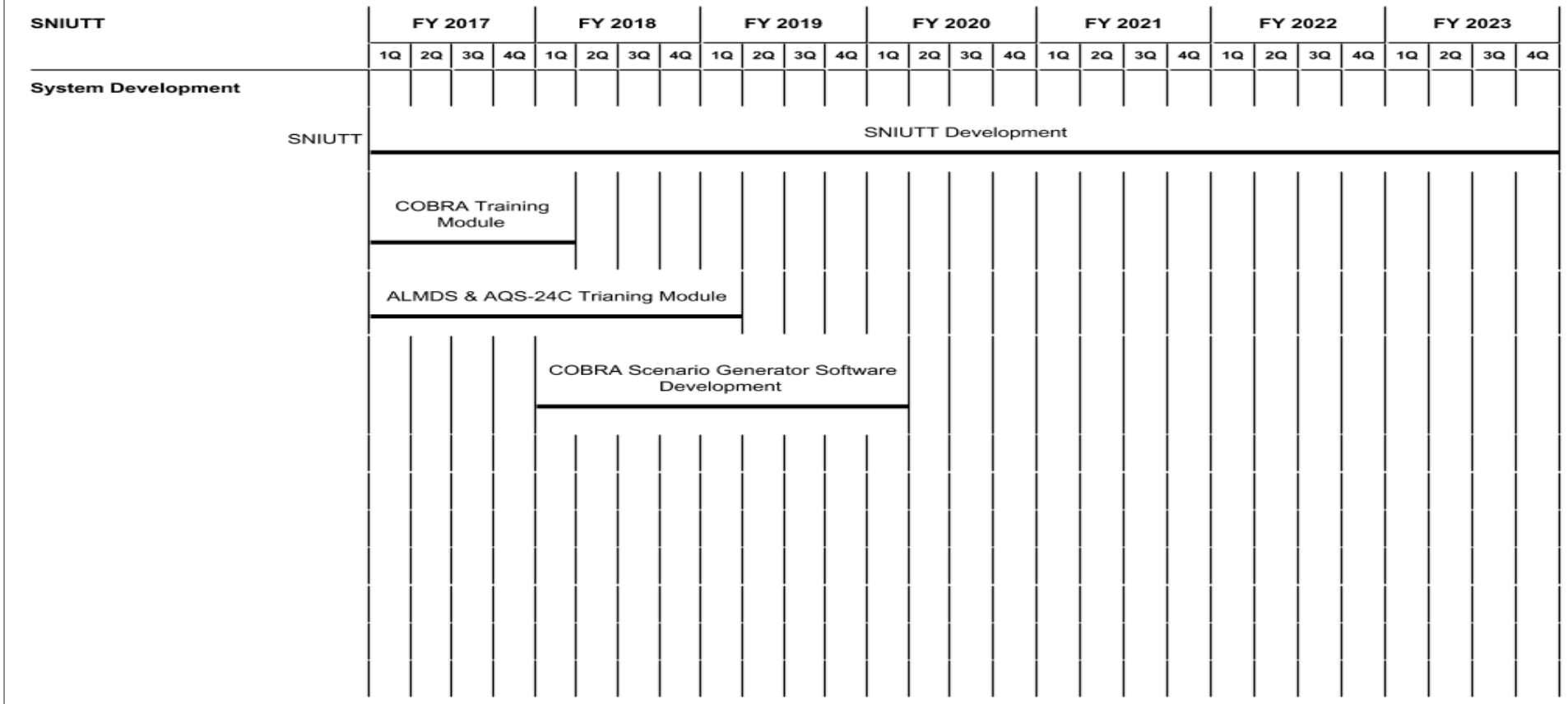
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DAWDF	Various	Various : Various	0.003	0.000		0.000		0.000		-		0.000	0.000	0.003	-
		Subtotal	0.003	0.000		0.000		0.000		-		0.000	0.000	0.003	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.795	1.317		1.259		0.912		-		0.912	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 9179 / *Surf Navy Integ Undersea Tactical Tech*



2019DON - 0604373N - 9179

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604373N / *Airborne Mine Countermeasures (AMCM)*	**Project (Number/Name)** 9179 / *Surf Navy Integ Undersea Tactical Tech*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SNIUTT				
System Development: SNIUTT: SNIUTT	1	2017	4	2023
System Development: SNIUTT: COBRA Training Module	1	2017	1	2018
System Development: SNIUTT: ALMDS and AQS-24C Training Module	1	2017	1	2019
System Development: SNIUTT: Scenario Generator Software System	1	2018	1	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604378N *I Nav Integrated Fire Control-Counter Air Sys Eng*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	189.359	25.086	25.445	33.429	-	33.429	35.439	34.732	34.392	34.911	Continuing	Continuing
3159: *Naval Integrated Fire Control-Counter Air SE&I*	189.359	25.086	25.445	33.429	-	33.429	35.439	34.732	34.392	34.911	Continuing	Continuing

A. Mission Description and Budget Item Justification

3159 Naval Integrated Fire Control - Counter Air (NIFC-CA) Systems Engineering Integration and Test (SEI&T) project is a systems engineering effort to extend the Naval Integrated Air and Missile Defense battlespace out to the maximum kinematic range of our weapons. This includes targets beyond the detection range of the shooter, including Engage On Remote (EoR) and Over the Horizon (OTH) targets. The NIFC-CA project exploits capabilities inherent in existing systems, optimizes current and emerging technologies in component system upgrades, integrates them together, and performs kill chain tests, forming an interoperable System of Systems (SoS) to maximize future air defense capabilities. As directed by OPNAV, the project is focused on SEI&T efforts to integrate the From The Sea (FTS) kill chain consisting of the E-2D Advanced Hawkeye, Cooperative Engagement Capability (CEC), AEGIS, and SM-6 missile. This PE will support efforts including system definition and architecture development, performance prediction, performance assessment, system test and risk reduction efforts, system analysis, modeling and simulation, and capability demonstrations for the FTS kill chain. The project also facilitates the development of the concept of operations with the warfighter to maximize effectiveness when deployed with the Fleet and supports NIFC From the Air (FTA) Modeling and Simulation efforts.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	25.750	25.445	26.769	-	26.769
Current President's Budget	25.086	25.445	33.429	-	33.429
Total Adjustments	-0.664	0.000	6.660	-	6.660
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.664	0.000			
• Program Adjustments	0.000	0.000	6.863	-	6.863
• Rate/Misc Adjustments	0.000	0.000	-0.203	-	-0.203

Change Summary Explanation

FY19 increase of $6.660M due to $9.0M increase for new NIFC From the Air (FTA) Modeling & Simulation program, the FY19 funding request reduction of $2.137M to account for the availability of prior year execution balances and rate/misc adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	Project (Number/Name) 3159 / *Naval Integrated Fire Control-Counter Air SE&I*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3159: *Naval Integrated Fire Control-Counter Air SE&I*	189.359	25.086	25.445	33.429	-	33.429	35.439	34.732	34.392	34.911	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

3159 Naval Integrated Fire Control - Counter Air (NIFC-CA) Systems Engineering Integration and Test (SEI&T) project is a systems engineering effort to extend the Naval Integrated Air and Missile Defense battlespace out to the maximum kinematic range of our weapons. This includes targets beyond the detection range of the shooter, including Engage On Remote (EoR) and Over the Horizon (OTH) targets. The NIFC-CA project exploits capabilities inherent in existing systems, optimizes current and emerging technologies in component system upgrades, integrates them together, and performs kill chain tests, forming an interoperable System of Systems (SoS) to maximize future air defense capabilities. NIFC-CA consists of three kill chains called From the Air (FTA), From the Sea (FTS), and From the Land (FTL). As directed by OPNAV, the project is focused on SEI&T efforts to integrate the From The Sea (FTS) kill chain consisting of the E-2D Advanced Hawkeye, Cooperative Engagement Capability (CEC), AEGIS, and SM-6 missile. This PE will support efforts including system definition and architecture development, performance prediction, performance assessment, system test and risk reduction efforts, system analysis, modeling and simulation, and capability demonstrations for the FTS kill chain. The project also facilitates the development of the concept of operations with the warfighter to maximize effectiveness when deployed with the Fleet.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Integration and Test (I&T) Integrated Product Team (IPT)	10.528	10.320	10.016	0.000	10.016
Articles:	-	-	-	-	-
Description: The Integration and Test (I&T) Integrated Product Team (IPT) develops and executes the test plan to assess the FTS operational capability, performs risk reduction testing leveraging various component system tests. Test data will be used over time to verify, validate, and accredit the FTS simulation federation.					
FY 2018 Plans: - The I&T IPT will continue to plan and execute the two scheduled Live Fire Test Events and conduct follow-on NIFC-CA battlespace assessments for AEGIS Baseline 9 and SM-6 BLK I. - Complete WSMR Desert Ship Upgrades. - Plan and execute WSMR ACB-16 / SM-6 Blk IA Live Fire Event. - Plan for ACB-20 improvements for NIFC-CA.					
FY 2019 Base Plans: - NIFC-CA FTS tests are scheduled every 9 months but are adjusted based on asset availability.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	**Project (Number/Name)** 3159 / *Naval Integrated Fire Control-Counter Air SE&I*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- The White Sands Missile Range is being upgraded to Desert Ship Upgrade (DSU) III configuration in FY17-19 to support NIFC-CA Increment 2 testing requirements. - Conduct two Live Fire Events (One SM-6 Blk 1 regression test and One SM-6 Blk 1A). These live fire events will verify the NIFC-CA 2019 capability improvements prior to fleet introduction in FY20. These live fire tests will also support the first Carrier Strike Group (CSG) deployment of the Increment 2 capability. - The capability assessment from COMOPTEVFOR for NIFC-CA Increment 2 capability will occur in FY19. - NIFC-CA Increment 3 risk reduction testing will continue in FY19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease of $.304M due reduced requirements to test and verify that the NIFC-CA capability improvements are ready for fleet introduction.					
Title: NIFC From the Air (FTA) Modeling & Simulation ***Articles:*** ***Description:*** From the Air (FTA) kill chain provides integrated capabilities to engage advanced threats with E-2D Advanced Hawkeye, the F/A-18A+/C/D Hornet, the F/A-18E/F Super Hornet and EA-18G Growler, F-35 Lightning II, AIM-120 and AIM-9X Missiles, and Link 16 and Tactical Targeting Network Technology Networks. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** NIFC FTA Increment 2 and 2A is for Test and Evaluation planning and execution. The NIFC FTA Inc 2 and 2A Cooperative Engagement Modes performance verification and validation requires developing System of Systems level modeling and simulation to predict performance of the integrated systems listed above against advanced threats. NIFC FTA Increment 3 is for requirements definition, allocation, and engineering analyses. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increase for Test and Evaluation, Modeling and Simulation and requirements.	0.000 -	0.000 -	9.000 -	0.000 -	9.000 -
Title: Engineering Management And System Definition	14.558	15.125	14.413	0.000	14.413

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	**Project (Number/Name)** 3159 / *Naval Integrated Fire Control-Counter Air SE&I*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
Description: Engineering management and system definition including the development of the Systems Performance Document (SPD), SoS functional allocations, requirements, traceability, SoS trades studies, SoS information exchange requirements, interface specifications, and sensor network capability analysis. Provides for complete FTS kill chain performance analysis and interface verification through development of a federation of simulations provided directly from the FTS Programs of Record. Program Of record consists of the E-2D Advanced Hawkeye, CEC, AEGIS, and SM-6 missile. Federated SoS simulations support architecture development, scenario development, predictive analysis for testing, and define capabilities and limitations of FTS kill chain performance analysis and interface verification through development of a federation of simulations provided directly from the FTS Programs of Record. Federated SoS simulations support architecture development, scenario development, predictive analysis for testing, and define capabilities and limitations of FTS kill chain for deployment. ***FY 2018 Plans:*** - Continue WSMR Desert Ship Upgrades to a AEGIS ACB 16 baseline. - Significant system engineering efforts are required to upgrade WSMR Desert Ship complex to an AEGIS ACB 16 baseline. This will support the AEGIS ACB-16 configuration and SM-6 BLK IA live fire test and will demonstrate improved FTS capability. ***FY 2019 Base Plans:*** - Continue Desert Ship ACB-16 updates. Updates support program risk reduction testing for NIFC-CA 2019 capability. - Begin follow-on (NIFC-CA Increment 3) System-of-Systems technical definition and requirements. - Conduct one SM-6 Blk IA Live Fire Event that will demonstrate improved FTS capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease of $.712M due to reduced engineering efforts for ACB 16 updates to the Desert Ship.					
Accomplishments/Planned Programs Subtotals	25.086	25.445	33.429	0.000	33.429

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	**Project (Number/Name)** 3159 / *Naval Integrated Fire Control-Counter Air SE&I*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 0604366N: *Standard Missile SM-6*	2.147	6.191	2.988	-	2.988	5.138	5.398	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Test Program and analysis conducted using the NIFC-CA Federation will provide data to verify NIFC-CA performance with respect to NIFC-CA MOEs, MOPs, and requirements being tracked as NIFC-CA related in the Pillar Programs. NIFC-CA Federation, once validated using test event data, will be used to update the expected performance of NIFC-CA, as required, and provide feedback to Pillar programs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	Project (Number/Name) 3159 / *Naval Integrated Fire Control-Counter Air SE&I*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	Various	Various : Various	43.994	2.840	Dec 2016	2.791	Dec 2017	3.460	Dec 2018	-		3.460	0.000	53.085	-
Systems Engineering	C/CPFF	JHU/APL : Laurel, MD	3.180	0.525	Dec 2016	0.640	Dec 2017	0.714	Dec 2018	-		0.714	0.000	5.059	-
Systems Engineering	C/CPFF	NGIS : Melbourne, FL	8.201	0.214	Oct 2016	0.238	Oct 2017	0.000		-		0.000	0.000	8.653	-
Systems Engineering	C/CPFF	LM MS2 : Moorestown, NJ	27.497	11.329	Dec 2016	11.810	Dec 2017	15.130	Dec 2018	-		15.130	0.000	65.766	-
Systems Engineering	C/CPFF	Raytheon Co. : St. Petersburg, FL	13.592	0.545	Oct 2016	0.605	Oct 2017	1.088	Oct 2018	-		1.088	0.000	15.830	-
Systems Engineering	WR	COTF : Norfolk, VA	0.785	0.000		0.000		0.000		-		0.000	0.000	0.785	-
		Subtotal	97.249	15.453		16.084		20.392		-		20.392	0.000	149.178	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration and Test	C/CPFF	Raytheon : St. Petersburg, FL	7.392	0.093	Dec 2016	0.095	Dec 2017	0.429	Dec 2018	-		0.429	0.000	8.009	-
Integration and Test	WR	COTF : Norfolk, VA	0.013	0.000		0.000		0.000		-		0.000	0.000	0.013	-
Integration and Test	C/BA	Wallops Island : Wallops Island, VA	0.247	0.000		0.000		0.000		-		0.000	0.000	0.247	-
Integration and Test	WR	NAWC AD : Pax River, MD	0.250	0.000		0.000		0.483	Nov 2018	-		0.483	0.000	0.733	-
Integration and Test	C/CPFF	Lockheed Martin - Moorestown, NJ : Moorestown, NJ	19.281	2.842	Dec 2016	2.480	Dec 2017	3.784	Dec 2018	-		3.784	Continuing	Continuing	Continuing
Integration and Test	WR	PT MUGU : PT Mugu, CA	6.197	0.612	Oct 2016	0.750	Oct 2017	1.034	Oct 2018	-		1.034	0.000	8.593	-
Integration and Test	Various	Various : Various	34.858	4.978	Feb 2017	4.908	Dec 2017	5.061	Dec 2018	-		5.061	Continuing	Continuing	Continuing
Integration and Test	MIPR	Dept of Interior : Boise, ID	2.130	0.210	Jan 2017	0.238	Dec 2017	1.031	Dec 2018	-		1.031	0.000	3.609	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	Project (Number/Name) 3159 / *Naval Integrated Fire Control-Counter Air SE&I*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration and Test	WR	NSWC/PHD : Port Hueneme, CA	3.123	0.000		0.000		0.212	Dec 2018	-		0.212	Continuing	Continuing	Continuing
		Subtotal	73.491	8.735		8.471		12.034		-		12.034	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Planning and Management	C/CPFF	Various : Various	18.619	0.898	Feb 2017	0.890	Dec 2017	1.003	Dec 2018	-		1.003	Continuing	Continuing	Continuing
		Subtotal	18.619	0.898		0.890		1.003		-		1.003	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	189.359	25.086		25.445		33.429		-		33.429	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	**Project (Number/Name)** 3159 / *Naval Integrated Fire Control-Counter Air SE&I*

NIFC-CA
FTS Planning Schedule

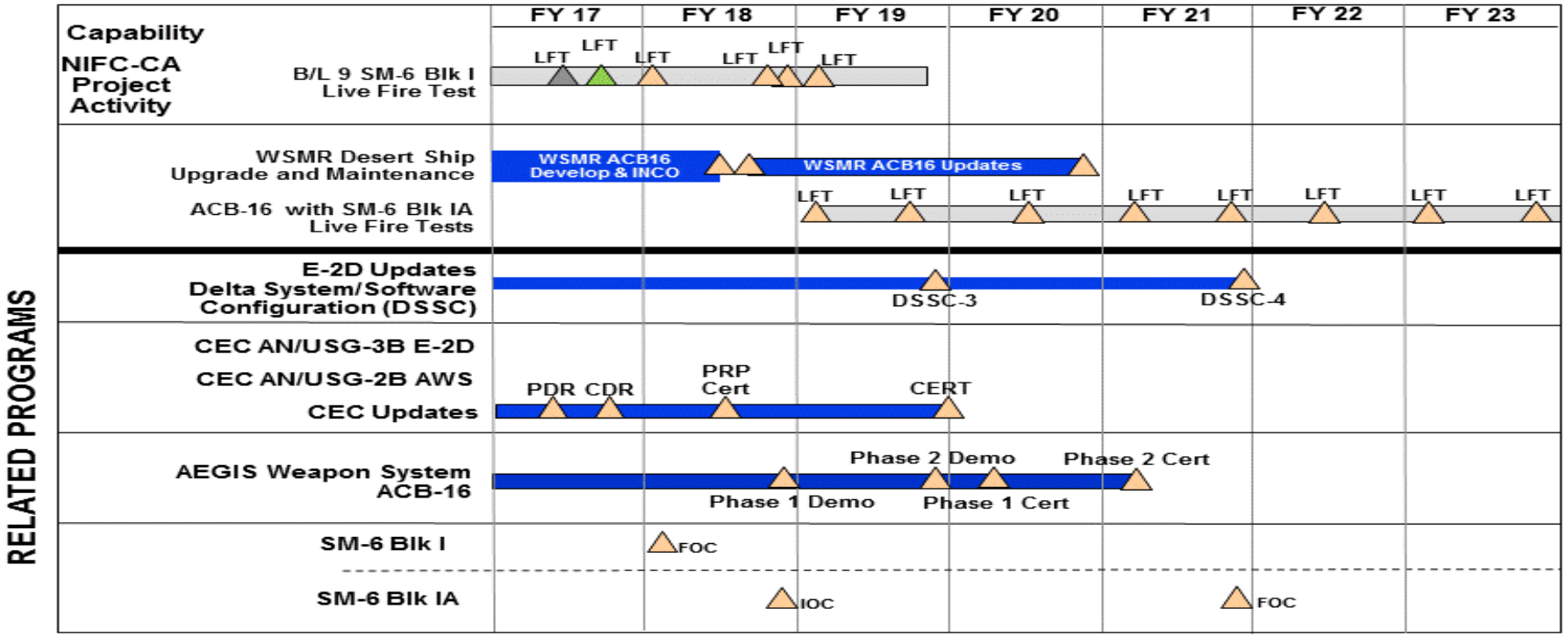


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	**Project (Number/Name)** 3159 / *Naval Integrated Fire Control-Counter Air SE&I*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3159				
NIFC-CA PROJECT ACTIVITY: NIFC-CA Project Activity: B/L 9 SM-6 Blk I Live Fire Test (Rescheduled to QTR 1 YR 2018)	2	2017	2	2017
NIFC-CA PROJECT ACTIVITY: NIFC-CA Project Activity: B/L 9 SM-6 Blk I Live Fire Test 3/17	3	2017	3	2017
NIFC-CA PROJECT ACTIVITY: NIFC-CA Project Activity: B/L 9 SM-6 Blk I Live Fire Test 1/18	1	2018	1	2018
NIFC-CA PROJECT ACTIVITY: NIFC-CA Project Activity: B/L 9 SM-6 Blk I Live Fire Test 4/18	4	2018	4	2018
NIFC-CA PROJECT ACTIVITY: NIFC-CA Project Activity: B/L 9 SM-6 Blk I Live Fire Test 4/18 2	4	2018	4	2018
NIFC-CA PROJECT ACTIVITY: NIFC-CA Project Activity: B/L 9 SM-6 Blk I Live Fire Test 1/19	1	2019	1	2019
White Sands Missile Range (WSMR): WSMR Desert Ship Upgrade and Maintenance Development and Installation and Check Out	1	2017	3	2018
White Sands Missile Range (WSMR): WSMR Desert Ship Upgrade and Maintenance Development and Installation and Check Out: WSMR ACB-16 Updates	4	2018	4	2020
ACB 16 With SM-6Blk 1A Live Fire Tests: ACB-16 with SM-6 Blk IA Live Fire Test 4/18	1	2019	1	2019
ACB 16 With SM-6Blk 1A Live Fire Tests: ACB-16 with SM-6 Blk IA Live Fire Test 3/19	3	2019	3	2019
ACB 16 With SM-6Blk 1A Live Fire Tests: ACB-16 with SM-6 Blk IA Live Fire Test 2/20	2	2020	2	2020
ACB 16 With SM-6Blk 1A Live Fire Tests: ACB-16 with SM-6 Blk IA Live Fire Test 121	1	2021	1	2021
ACB 16 With SM-6Blk 1A Live Fire Tests: ACB-16 with SM-6 Blk IA Live Fire Test 3/21	3	2021	3	2021
ACB 16 With SM-6Blk 1A Live Fire Tests: ACB-16 with SM-6 Blk IA Live Fire Test 2/22	2	2022	2	2022
ACB 16 With SM-6Blk 1A Live Fire Tests: ACB-16 with SM-6 Blk IA Live Fire Test 1/23	1	2023	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604378N / *Nav Integrated Fire Control-Counter Air Sys Eng*	**Project (Number/Name)** 3159 / *Naval Integrated Fire Control-Counter Air SE&I*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ACB 16 With SM-6Blk 1A Live Fire Tests: ACB-16 with SM-6 Blk IA Live Fire Test 4/23	4	2023	4	2023
E-2D Updates Delta System/Software Configuration (DSSC): E-2D UPDATES DELTA SYSTEM SOFTWARE CONFIGURATION (DSSC-3)	4	2019	4	2019
E-2D Updates Delta System/Software Configuration (DSSC): E-2D UPDATES DELTA SYSTEM SOFTWARE CONFIGURATION (DSSC-4)	4	2021	4	2021
CEC Updates: CEC Updates: PDR	2	2017	2	2017
CEC Updates: CEC Updates: CDR	3	2017	3	2017
CEC Updates: CEC Updates: PRP Certification	3	2018	3	2018
CEC Updates: CEC Updates: Certification	4	2019	4	2019
Aegis Weapon System ACB 16: Aegis Weapon System ACB-16: Phase 1 Demonstration	4	2018	4	2018
Aegis Weapon System ACB 16: Aegis Weapon System ACB-16: Phase 2 Demonstration	4	2019	4	2019
Aegis Weapon System ACB 16: Aegis Weapon System ACB-16: Phase 1 Certification	2	2020	2	2020
Aegis Weapon System ACB 16: Aegis Weapon System ACB-16: Phase 2 Certification	2	2021	2	2021
SM-6 Blk 1 & SM-6 Blk 1A: SM-6 Blk I: FOC	1	2018	1	2018
SM-6 Blk 1 & SM-6 Blk 1A: SM-6 Blk IA: IOC	4	2018	4	2018
SM-6 Blk 1 & SM-6 Blk 1A: SM-6 Blk IA: FOC	4	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604501N *I Advanced Above Water Sensors*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	292.885	70.658	87.233	35.635	-	35.635	17.393	15.793	14.817	15.127	Continuing	Continuing
3188: *Dual-Band Radar*	100.919	4.669	5.165	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	110.753
3232: *Multi-Mission Signal Processor*	156.332	2.215	2.442	2.464	-	2.464	2.054	3.048	3.103	3.176	Continuing	Continuing
3236: *Advanced Radar Technology*	20.686	53.331	68.665	25.257	-	25.257	2.141	0.000	0.000	0.000	0.000	170.080
3301: *Improved Capabilities SPY-1 Radar*	14.948	10.443	10.961	7.914	-	7.914	13.198	12.745	11.714	11.951	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $5.25 million to account for the availability of prior year execution balances.

Dual Band Radar (DBR) Upgrades: Funding is for Dual Band Radar (DBR) System upgrades to implement cost savings initiatives for Volume Search Radar (VSR) modifications, supportability analysis and associated logistics product updates; future upgrades/technology insertion efforts for Multi-Function Radar (MFR)/VSR as a part of the DBR suite on CVN 78 and the MFR on DDG 1000 Class ships. Funding is also required to resolve the hardware and software issues discovered during the various test events to include: DTB2-411, Self Defense Test Ship (SDTS) testing, Land Based Testing and pertinent At-Sea test events. The upgrades will include all aspects of the radar system/subsystems, including hardware and software. Specific subsystem areas include the Array, Transmit/Receive (T/R) module, Receiver/ Exciter, Signal Data Processor, Radome, and power/cooling systems. Upgrades and technology insertions are required to maintain the level of force protection needed for ship defense against all threats envisioned in the littoral environment. The supportability analysis and logistic products associated with these upgrades will also be developed and updated. DBR CVN 78 Testing and Certification: FY17-FY18 requirement supports DBR At-Sea Test and Evaluation (T&E), Environmental Testing and DBR Systems Certification for CVN 78. FY2018 is the final year of RDT&E funding for this program.

Multi-Mission Signal Processor (MMSP): The development of MMSP provides simultaneous Anti-Air Warfare (AAW)/Ballistic Missile Defense (BMD) multi-mission capability for DDG 51 class ships as part of the Aegis Modernization Program. This capability is utilized for DDG 113 and follow new construction and Aegis Ashore. Modifies SPY-1D transmitters to enable dual beam for reduced frame times and better reaction time, provides stability for all D(V) waveforms, and avoids operational degradation. The SPY-1 radar system detects, tracks, and supports engagements of a broader range of threats. MMSP improves performance in littoral, ducted clutter, electronic attack (EA), and chaff environments and provides greater commonality in computer programs and equipment. This effort also provides for the development of MMSP on Destroyers Commercial Off The Shelf (COTS) refresh and MMSP technology refresh. MMSP development includes the commencement of technology refresh to support Aegis Modernization due to Diminishing Manufacturing Sources and Material Shortages (DMSMS) and obsolescence issues. MMSP technology refresh, including MMSP-Refresh (MMSP-R), began in FY16. MMSP-R includes software updates required on new computer platforms. Engineering efforts will be required to assess alternate technologies and determine optimal MMSP architectural solutions, which will include system security requirements. FY18 concludes MMSP on Destroyers COTS Refresh (ECPs), includes support for MMSP-R radar Integration & Test (I&T) and Advanced Capability Build 16 (ACB16) Phase 0 certification.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604501N *I Advanced Above Water Sensors*

Advanced Radar Technology (ART): Enterprise Air Surveillance Radar (EASR) will modify an existing radar technology to meet the air surveillance requirements for multiple ship classes. EASR will be one sensor in a suite that is designed to meet the performance needs for ship self-defense, situational awareness and air traffic control. EASR will replace the Volume Search Radar (VSR) in the CVN 78 Class Dual Band Radar system and the AN/SPS-48/49 radar systems in numerous ship classes. The AN/SPS-48 Radars are long-range, three-dimensional (3-D) radars used to search, detect and provide space-stabilized, three-coordinate (range, bearing, height) data for air intercept control and designation to a weapon system. The AN/SPS-49A(V)1 radar system is a long range, two dimensional (2-D), L-Band air surveillance radar installed on USN major combatants. The AN/SPY-4 Volume Search Radar (VSR) is an S-Band active phased array radar deployed on CVN 78 providing volume surveillance and air traffic control. EASR funding will develop a modern 3-D air search radar that addresses the latest requirements for Aviation and Amphibious Warfare Ships and closely conforms to existing combat system interfaces, as well as aligns with existing shipboard space, weight, and power limits. The architecture and acquisition strategy for EASR is intended to drive a lower recurring cost by utilizing the same core technology for both fixed-face and rotating array variants. EASR will provide for engineering of component and system level technology improvements for equipment used by in-service air search radars.

Enterprise X-Band Illuminator (EXI): EXI funding will support the development of an X-band illuminator transmitter modification compatible with the EASR radar and Combat System suite for CVN and Amphibious ship classes.

Improved Capabilities for SPY-1 Radar: These Reliability, Maintainability, and Availability (RM&A) improvements and solid state technology insertions are intended to reduce cascading failures, mitigate obsolescence issues, and improve reliability in support of Anti-Air Warfare (AAW) and Ballistic Missile Defense (BMD) missions while still providing AN/SPY-1 Radar Total Ownership Cost Reductions. Improvements such as Solid State Insertion will yield reductions in annual fleet maintenance costs and is a top fleet requirement as part of the AEGIS Wholeness initiative. In addition to RM&A improvements, warfighting improvements funded in this line include: Transmitter Noise Cancellation (TNC) development will include hardware/software to counter low radar cross section, low altitude threats. Side Lobe Blanking (SLB) addresses shortfalls in mixed electronic attack environment while in an Integrated Air and Missile Defense (IAMD) mode. The Ship-Based Non-Cooperative Target Recognition (SBNCTR) program phases 2 and 3 will develop algorithms to provide classification for targets. Transition of Advanced Calibration Experiment (ACE) phases 1 and 2 from Baseline 7 into Baseline 9. Electronic Attack (EA) and Rapid Radar Capability Improvement Program (R2CIP) develop solutions for evolving EA threats. FY19 includes completion of ACE Phase 1, continuation of development of ACE Phase 1, SBNCTR Phase 2, TNC, EA improvements, 10KW Amp/CFA Solid State GaN and initiation of Elevated Radar Advanced Calibration Experiment (ERACE).

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604501N *I Advanced Above Water Sensors*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	85.868	87.233	41.722	-	41.722
Current President's Budget	70.658	87.233	35.635	-	35.635
Total Adjustments	-15.210	0.000	-6.087	-	-6.087
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.197	0.000			
• Program Adjustments	0.000	0.000	-5.339	-	-5.339
• Rate/Misc Adjustments	-0.001	0.000	-0.748	-	-0.748
• Congressional General Reductions Adjustments	-0.012	-	-	-	-
• Congressional Directed Reductions Adjustments	-13.000	-	-	-	-

Change Summary Explanation

FY18 to FY19 decrease: The decrease from FY18 to FY19 is primarily due to two factors: 1) FY18 is the last year of funding for DBR; and 2) EASR development and testing, including procurement of test assets, ramps down from FY18 to FY19.

The FY19 funding request was reduced in Advanced Radar Technology by $2.250 million and Improved Capabilities SPY 1 Radar by $3.0 million to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604501N / *Advanced Above Water Sensors*	Project (Number/Name) 3188 / *Dual-Band Radar*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3188: *Dual-Band Radar*	100.919	4.669	5.165	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	110.753
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Dual-Band Radar (DBR) Upgrades: Funding is for Dual Band Radar (DBR) System upgrades to implement cost savings initiatives for Volume Search Radar (VSR) modifications, supportability analysis and associated logistics product updates; future upgrades/technology insertion efforts for Multi-Function Radar (MFR)/VSR as a part of the DBR suite on CVN 78 Class ships and the MFR on DDG 1000 Class ships. Funding is also required to resolve the hardware and software issues discovered during the various test events to include: DTB2-411, SDTS testing, Land Based Testing and pertinent At-Sea test events. The upgrades will include all aspects of the radar system/subsystems, including hardware and software. Specific subsystem areas include the Array, Transmit/Receive (T/R) module, Receiver/Exciter, Signal Data Processor, Radome, and power/cooling systems. Upgrades and technology insertions are required to maintain the level of force protection needed for ship defense against all threats envisioned in the littoral environment. The supportability analysis and logistic products associated with these upgrades will also be developed and updated. DBR CVN 78 Testing and Certification: FY17-FY18 requirement supports DBR At-Sea Test and Evaluation (T&E), Environmental Testing and DBR Systems Certification for CVN 78. FY2018 is the final year of RDT&E funding for this program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: RADAR UPGRADES TECHNOLOGY INSERTION	2.000	2.994	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete technology insertion for the MFR/VSR/DBR hardware and software and development/updates to associated logistics products. - Complete technical support for DBR element certification in support of overall combat system certification. - Complete planning for DBR environmental testing. - Complete DBR at-sea shipboard testing.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: DBR RDT&E funding ends in FY18.					
Title: RADAR UPGRADES GOVERNMENT ENGINEERING SERVICES	2.454	2.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3188 / *Dual-Band Radar*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete Government Engineering Services support radar upgrades and technology insertion of the MFR/ VSR/DBR radars. Complete oversight and assessment of efforts associated with this phase of the program. - Complete Government Engineering Services support for DBR element certification in support of overall combat system certification. - Complete Government Engineering Services support for DBR EMI testing and analysis efforts. - Complete Government Engineering Services support for DBR environmental testing. - Complete Government Engineering Services support for DBR at-sea shipboard testing. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** DBR RDT&E funding ends in FY18.					
Title: RADAR UPGRADES PROGRAM MANAGEMENT	0.215	0.171	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete Program Management and logistics support for radars upgrades and technology insertion of the MFR/VSR/DBR radars. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** DBR RDT&E funding ends in FY18.					
Accomplishments/Planned Programs Subtotals	4.669	5.165	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3188 / *Dual-Band Radar*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2980: *BLI 2980/ OPN Items Less Than $5M*	47.664	105.292	148.350	-	148.350	171.540	205.578	162.820	155.744	536.969	26,327.382
• O&M,N/1C2C/0702228N: *0702228N/1C2C/O&M,N*	2.397	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	11.765
• O&M,N/1C1C/0702228N: *0702228N/1C1C/O&M,N*	0.000	2.623	9.906	-	9.906	9.287	10.044	9.398	9.558	Continuing	Continuing

Remarks

D. Acquisition Strategy

Radar Upgrades and logistic products will be developed to address lessons learned and technology refresh for DBR systems on multiple ship classes.

E. Performance Metrics

- Complete upgrade studies and analyses each fiscal year to determine efficiencies for Hardware (H/W) and Software (S/W) upgrades and to determine appropriate logistics product updates
- Complete Electromagnetic Interference (EMI) Testing and Analysis
- Complete upgrade technology insertion
- Complete development of logistics products
- Implement supportability analysis to improve supportability and reduce overall lifecycle cost
- Complete DBR At-Sea Test and Evaluation (T&E)
- Complete planning for DBR Environmental Testing
- Complete DBR Systems Certification
- Complete DBR/SEWIP interface development
- Complete DBR Shipboard Testing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3188 / *Dual-Band Radar*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	Other Government Activities : Various	1.143	0.000		0.000		0.000		-		0.000	0.000	1.143	-
Government Engineering Support	WR	NSWC/Dahlgren : Dahlgren, VA	14.959	1.153	Nov 2016	1.268	Oct 2017	0.000		-		0.000	0.000	17.380	-
Government Engineering Support	WR	NSWC/PHD : Port Hueneme, CA	6.473	0.323	May 2017	0.000		0.000		-		0.000	0.000	6.796	-
Government Engineering Support	WR	NSWC/Crane : Crane, IN	5.281	0.000		0.026	Nov 2017	0.000		-		0.000	0.000	5.307	-
Government Engineering Support	WR	NRL : Washington, DC	3.725	0.000		0.000		0.000		-		0.000	0.000	3.725	-
Government Engineering Support	SS/CPFF	JHU/APL : Columbia, MD	1.492	0.600	Dec 2016	0.605	Nov 2017	0.000		-		0.000	0.000	2.697	-
Government Engineering Support	MIPR	NSMA : Arlington, VA	0.903	0.000		0.000		0.000		-		0.000	0.000	0.903	-
Government Engineering Support	SS/CPFF	GTRI : Atlanta, GA	1.158	0.000		0.000		0.000		-		0.000	0.000	1.158	-
Government Engineering Support	WR	NSWC/Carderock : Philadelphia, PA	0.202	0.162	Nov 2016	0.101	Oct 2017	0.000		-		0.000	0.000	0.465	-
Government Engineering Support	WR	NSWC/Dam Neck : Dam Neck, VA	1.274	0.000		0.000		0.000		-		0.000	0.000	1.274	-
Government Engineering Support	SS/CPFF	AEGIS Tech Rep : Moorestown, NJ	0.014	0.000		0.000		0.000		-		0.000	0.000	0.014	-
Government Engineering Support	WR	TASC : Andover, MA	0.048	0.000		0.000		0.000		-		0.000	0.000	0.048	-
Government Engineering Support	WR	NSWC/Corona : Corona, CA	0.498	0.216	Jun 2017	0.000		0.000		-		0.000	0.000	0.714	-
Government Engineering Support	WR	NAWC/PT MUGU : PT MUGU, CA	0.586	0.000		0.000		0.000		-		0.000	0.000	0.586	-
Systems Engineering	SS/CPFF	Raytheon : Raytheon, Sudbury, MA	54.686	2.000	Mar 2017	2.994	Oct 2017	0.000		-		0.000	0.000	59.680	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3188 / *Dual-Band Radar*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	SS/CPAF	Raytheon IDS : San Diego, CA	1.500	0.000		0.000		0.000		-		0.000	0.000	1.500	-
Systems Engineering	SS/CPFF	General Dynamics AIS : Fairfax, VA	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
Systems Engineering	SS/CPFF	PMS 320 Syntek : Arlington, VA	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
		Subtotal	95.342	4.454		4.994		0.000		-		0.000	0.000	104.790	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPIF	SPA (SEAPORT) : Washington, DC	4.719	0.000		0.000		0.000		-		0.000	0.000	4.719	-
DAWDF	Allot	N/A : N/A	0.027	0.000		0.000		0.000		-		0.000	0.000	0.027	-
Travel	Allot	PEOIWS2 : Washington, DC	0.180	0.020	Jul 2017	0.030	Mar 2018	0.000		-		0.000	0.000	0.230	-
Program Management Support	C/CPIF	ALION : Washington, DC	0.026	0.000		0.000		0.000		-		0.000	0.000	0.026	-
Program Management Support	C/CPFF	CACI : Washington, DC	0.316	0.000		0.000		0.000		-		0.000	0.000	0.316	-
Program Management Support	C/CPIF	TMB : Washington, DC	0.047	0.000		0.000		0.000		-		0.000	0.000	0.047	-
Program Management Support	C/CPIF	SPA : Washington, DC	0.000	0.195	Aug 2017	0.141	Nov 2017	0.000		-		0.000	0.000	0.336	-
Program Management Support	SS/CPIF	SPA (Bridge) : Washington, DC	0.262	0.000		0.000		0.000		-		0.000	0.000	0.262	-
		Subtotal	5.577	0.215		0.171		0.000		-		0.000	0.000	5.963	N/A

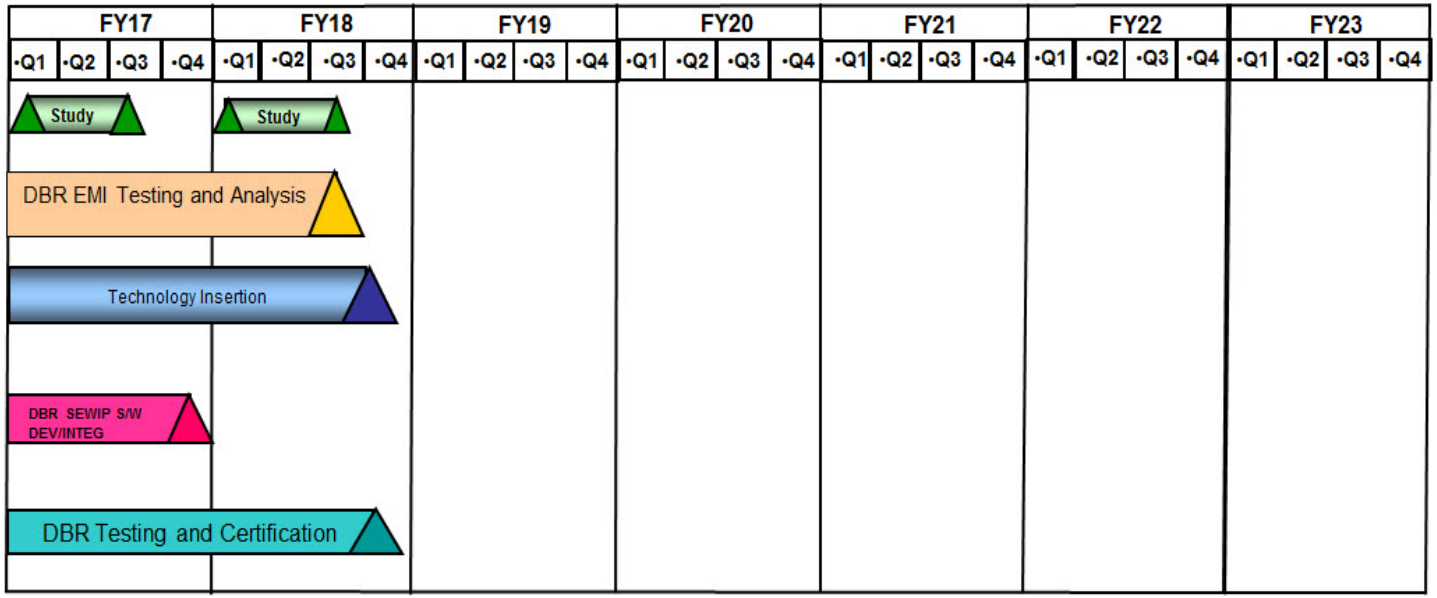
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604501N / *Advanced Above Water Sensors*	Project (Number/Name) 3188 / *Dual-Band Radar*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	100.919	4.669		5.165		0.000		-		0.000	0.000	110.753	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3188 / *Dual-Band Radar*

DBR System Upgrades



Note: Supportability Analysis is conducted in conjunction with the Study.
DBR At-Sea T&E, Planning for Environmental Testing and DBR System Certification are included in the DBR Testing and Certification support

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3188 / *Dual-Band Radar*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3188				
DBR System Upgrade Studies and Analysis	1	2017	3	2018
DBR EMI Testing and Analysis	1	2017	3	2018
DBR System Upgrade Technology Insertion	1	2017	4	2018
DBR SEWIP Software Development/Integration	1	2017	4	2017
DBR Testing and Certification	1	2017	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604501N / *Advanced Above Water Sensors*	Project (Number/Name) 3232 / *Multi-Mission Signal Processor*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3232: *Multi-Mission Signal Processor*	156.332	2.215	2.442	2.464	-	2.464	2.054	3.048	3.103	3.176	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Multi-Mission Signal Processor (MMSP): The development of MMSP provides simultaneous Anti-Air Warfare (AAW)/Ballistic Missile Defense (BMD) multi-mission capability for DDG 51 class ships as part of the Aegis Modernization Program. This capability is utilized for DDG 113 and follow new construction and Aegis Ashore. Modifies SPY-1D transmitters to enable dual beam for reduced frame times and better reaction time, provides stability for all D(V) waveforms, and avoids operational degradation. The SPY-1 radar system detects, tracks, and supports engagements of a broader range of threats. MMSP improves performance in littoral, ducted clutter, electronic attack (EA), and chaff environments and provides greater commonality in computer programs and equipment. This effort also provides for the development of MMSP on Destroyers Commercial Off The Shelf (COTS) refresh and MMSP technology refresh.

MMSP development includes the commencement of technology refresh to support Aegis Modernization due to Diminishing Manufacturing Sources and Material Shortages (DMSMS) and obsolescence issues. MMSP technology refresh, including MMSP-Refresh (MMSP-R), began in FY16. MMSP-R includes software updates required on new computer platforms. Engineering efforts will be required to assess alternate technologies and determine optimal MMSP architectural solutions, which will include system security requirements. FY18 concludes MMSP on Destroyers COTS Refresh (ECPs), includes support for MMSP-R radar Integration & Test (I&T) and Advanced Capability Build 16 (ACB16) Phase 0 certification.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SYSTEMS ENGINEERING	2.215	2.442	2.464	0.000	2.464
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue MMSP-R development to support AEGIS Modernization due to DMSMS and obsolescence issues. - Complete MMSP-R integration and test. - Complete MMSP on Destroyers COTS Refresh Engineering Change Proposals (ECPs). - Support ACB16 Phase 0 certification. - Commence support of MMSP-R ACB16 integration and test. - Continue to maintain alignment with the BMD Program and the associated BSP adjunct to incorporate BMD capability within MMSP during AEGIS Modernization. - Continue to support ACB12 and ACB16 MMSP improvements.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3232 / *Multi-Mission Signal Processor*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue MMSP-R development to support AEGIS Modernization due to DMSMS and obsolescence issues. - Complete MMSP-R ACB16 integration and test. - Conduct MMSP-R ACB16 Multi-Mission Exercise (MMEX). - Complete ACB16 Phase 1 Certification. - Conduct MMSP-R Demo. - Continue to maintain alignment with the BMD Program and the associated BSP adjunct to incorporate BMD capability within MMSP during AEGIS Modernization. - Continue to support ACB12 and ACB16 MMSP improvements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY19 is due to minor program and rate adjustments.					
Accomplishments/Planned Programs Subtotals	2.215	2.442	2.464	0.000	2.464

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/0900: *BLI 0900/ OPN DDG Modernization*	429.614	603.355	487.999	-	487.999	681.567	584.972	911.570	1,057.869	Continuing	Continuing

Remarks

D. Acquisition Strategy

Multi-Mission Signal Processor (MMSP) provides simultaneous AAW/BMD Multi-mission capability for AEGIS Modernization Program and leverages BMD 4.0.1 and SPY-1D(V) designs. This MMSP development efforts support integration of BMD 5.0 signal processing, and will lead to the OPN/SCN procurement for shore sites and shipsets. MMSP technology refresh will be incorporated into Baseline 9 and follow.

E. Performance Metrics

- Complete DDG Commercial Off The Shelf (COTS) Refresh - Engineering Change Proposal (ECP) for MMSP on Destroyers
- Complete ACB16 Phase 0 certification
- Complete ACB16 Phase 1 certification
- Complete ACB16 Phase 2 certification
- Complete ACB16 COTS Refresh

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3232 / *Multi-Mission Signal Processor*

- Complete MMSP-R Design and Development
- Complete MMSP-R Radar integration and test
- Complete MMSP-R ACB16 integration and test
- Complete MMSP-R ACB16 MMEX
- Complete MMSP-R Demo
- Complete MMSP-R ECPs

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3232 / *Multi-Mission Signal Processor*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SYSTEM ENGINEERING	SS/CPFF	Lockheed Martin : Moorestown, NJ	114.001	1.185	Nov 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	C/CPFF	AEGIS Techrep : Moorestown, NJ	5.218	0.123	Jul 2017	0.150	Feb 2018	0.150	Dec 2018	-		0.150	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	SS/FP	APL/JHU : Laurel, MD	4.841	0.070	Jan 2017	0.070	Feb 2018	0.075	Nov 2018	-		0.075	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	CSCS : Dahlgren, VA	1.580	0.000		0.062	Jun 2018	0.062	Jun 2019	-		0.062	0.000	1.704	-
SYSTEM ENGINEERING	WR	NRL : Washington, DC	2.970	0.088	Nov 2016	0.098	Oct 2017	0.102	Nov 2018	-		0.102	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	MIPR	MIT/LL : Lexington, MA	1.453	0.000		0.000		0.000		-		0.000	0.000	1.453	-
SYSTEM ENGINEERING	WR	NSWC/DD : Dahlgren, VA	8.432	0.374	Nov 2016	0.406	Oct 2017	0.415	Oct 2018	-		0.415	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	SCSC : Wallops Island, VA	0.019	0.000		0.000		0.000		-		0.000	0.000	0.019	-
SYSTEM ENGINEERING	WR	NSWC/CR : Crane, IN	4.025	0.122	Nov 2016	1.397	Oct 2017	1.379	Oct 2018	-		1.379	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	NSWC/PHD : Port Hueneme, CA	4.028	0.121	Nov 2016	0.162	Oct 2017	0.182	Oct 2018	-		0.182	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	Office of Naval Research : Arlington, VA	5.779	0.000		0.000		0.000		-		0.000	0.000	5.779	-
		Subtotal	152.346	2.083		2.345		2.365		-		2.365	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	PEOIWS2 : Washington, DC	0.228	0.010	Jan 2017	0.010	Nov 2017	0.010	Nov 2018	-		0.010	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3232 / *Multi-Mission Signal Processor*

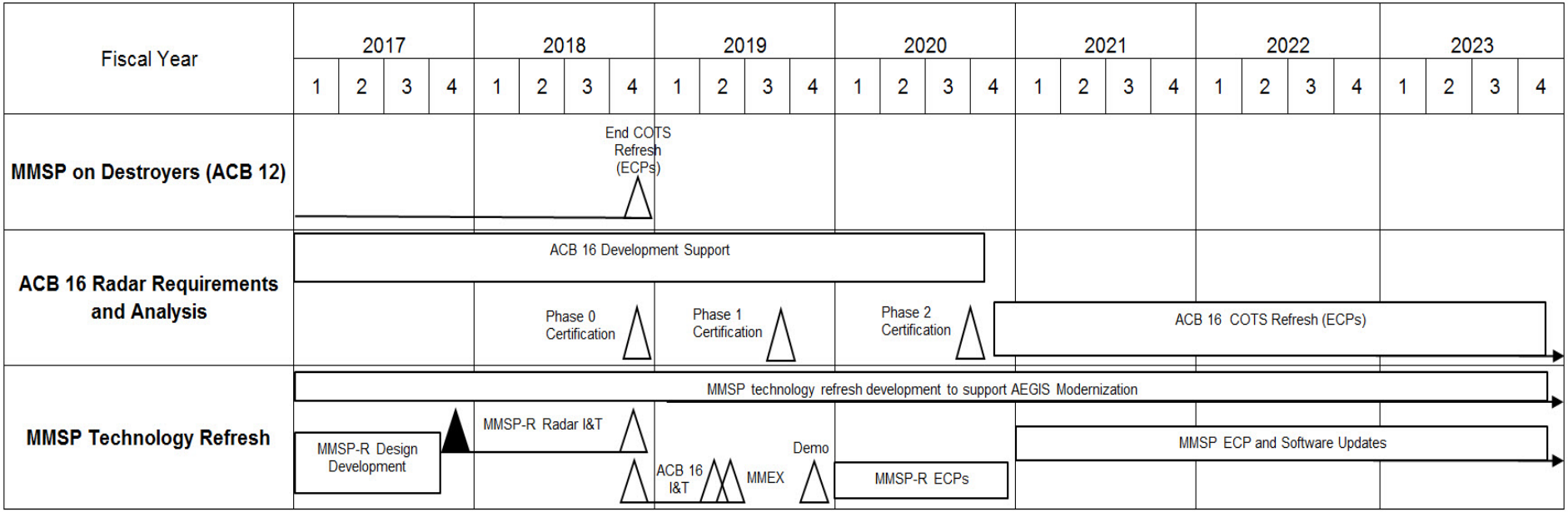
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Management Services	C/CPIF	SPA : Washington, DC	0.000	0.078	Aug 2017	0.087	Aug 2018	0.089	Nov 2018	-		0.089	Continuing	Continuing	Continuing
Support Management Services	SS/CPIF	SPA (Bridge) : Washington, DC	1.359	0.044	Feb 2017	0.000		0.000		-		0.000	0.000	1.403	-
Support Management Services	C/CPIF	SPA (SEAPORT) : Washington, DC	2.247	0.000		0.000		0.000		-		0.000	0.000	2.247	-
Support Management Services	C/CPFF	CACI : Washington, DC	0.094	0.000		0.000		0.000		-		0.000	0.000	0.094	-
Support Management Services	C/CPFF	TMB : Washington, DC	0.031	0.000		0.000		0.000		-		0.000	0.000	0.031	-
Support Management Services	C/CPFF	Strategic Insight : Washington, DC	0.027	0.000		0.000		0.000		-		0.000	0.000	0.027	-
		Subtotal	3.986	0.132		0.097		0.099		-		0.099	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	156.332	2.215		2.442		2.464		-		2.464	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3232 / *Multi-Mission Signal Processor*



ACB 16 COTS Refresh continues beyond the FYDP.
MMSP Technology Refresh continues beyond the FYDP.
FY17-23 funding is to support AEGIS capability upgrades for SPY-1 radar and signal processor.

Acronyms:

ACB: AEGIS Capability Build
COTS: Commercial Off The Shelf
I&T: Integration & Test
ECP: Engineering Change Proposal
MMEX: Multi-Mission Exercise
MMSP-R: Multi-Mission Signal Processor Refresh

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3232 / *Multi-Mission Signal Processor*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3232				
DDG Commercial Off The Shelf (COTS) Refresh - Engineering Change Proposals (ECP)	1	2017	4	2018
ACB16 Development Support	1	2017	3	2020
MMSP-Refresh (MMSP-R) Design Development	1	2017	4	2017
MMSP Technology Refresh to Support AEGIS Modernization	1	2017	4	2023
MMSP-R Radar Integration and Test	4	2017	4	2018
ACB16 Phase 0 Certification	4	2018	4	2018
MMSP-R ACB16 Integration and Test	4	2018	2	2019
MMSP-R ACB16 Multi-Mission Exercise (MMEX)	2	2019	2	2019
ACB16 Phase 1 Certification	3	2019	3	2019
MMSP-R Demo	4	2019	4	2019
MMSP-R ECPs	1	2020	4	2020
ACB16 Phase 2 Certification	3	2020	3	2020
ACB16 COTS Refresh (ECPs)	4	2020	4	2023
MMSP ECP and Software Updates	1	2021	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604501N / *Advanced Above Water Sensors*	Project (Number/Name) 3236 / *Advanced Radar Technology*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3236: *Advanced Radar Technology*	20.686	53.331	68.665	25.257	-	25.257	2.141	0.000	0.000	0.000	0.000	170.080
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Radar Technology (ART): Enterprise Air Surveillance Radar (EASR) will modify an existing radar technology to meet the air surveillance requirements for multiple ship classes. EASR will be one sensor in a suite that is designed to meet the performance needs for ship self-defense, situational awareness and air traffic control. EASR will replace the Volume Search Radar (VSR) in the CVN 78 Class Dual Band Radar system and the AN/SPS-48/49 radar systems in numerous ship classes. The AN/SPS-48 Radars are long-range, three-dimensional (3-D) radars used to search, detect and provide space-stabilized, three-coordinate (range, bearing, height) data for air intercept control and designation to a weapon system. The AN/SPS-49A(V)1 radar system is a long range, two dimensional (2-D), L-Band air surveillance radar installed on USN major combatants. The AN/SPY-4 Volume Search Radar (VSR) is an S-Band active phased array radar deployed on CVN 78 providing volume surveillance and air traffic control. EASR funding will develop a modern 3-D air search radar that addresses the latest requirements for Aviation and Amphibious Warfare Ships and closely conforms to existing combat system interfaces, as well as aligns with existing shipboard space, weight, and power limits. The architecture and acquisition strategy for EASR is intended to drive a lower recurring cost by utilizing the same core technology for both fixed-face and rotating array variants. EASR will provide for engineering of component and system level technology improvements for equipment used by in-service air search radars.

Enterprise X-Band Illuminator (EXI): EXI funding will support the development of an X-band illuminator transmitter modification compatible with the EASR radar and Combat System suite for CVN and Amphibious ship classes.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SYSTEMS ENGINEERING - EASR	38.846	45.016	11.611	0.000	11.611
Articles:	-	-	-	-	-
FY 2018 Plans: - Build up array and complete array integration - Conduct EASR TIMs - Commence EASR Simulator System Testing - Conduct Subsystem Level Testing - Continue EASR test planning in support of test site requirements - Continue supporting EASR IPTs and WGs to facilitate successful integration of the radar with the ship and combat system					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3236 / *Advanced Radar Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Decrease in FY18 from PB18 primarily due to contractor's refinement of estimates. Funding reallocated to government engineering services to procure test assets in support of test and evaluation efforts. OCO: - N/A ***FY 2019 Base Plans:*** - Conduct EASR TIMs - Continue EASR Simulator System Testing - Complete Test Readiness Review for DT-3 - Complete Transition Critical Design Review (CDR) - Complete Subsystem Level Testing - Commence combat system integration with the emulator - Continue EASR IPTs and WGs to facilitate successful integration of the radar with the ships and combat system - Commence land-based testing - Receive Long Lead Material Authorization for Low-Rate Initial Production (LRIP) units ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in FY19 is primarily due to the procurement of all the EDM hardware in FY18.					
Title: SYSTEMS ENGINEERING - X BAND ILLUMINATOR (EXI)	1.000	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A - There is no funding required for the EXI Development contract in FY18 since NATO SEASPARROW will be completing the EXI upgrade effort. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3236 / *Advanced Radar Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
Title: GOVERNMENT ENGINEERING SERVICES - EASR	12.053	22.491	12.478	0.000	12.478
Articles:	-	-	-	-	-

FY 2018 Plans:
- Continue to analyze and assess EASR E&MD contract deliverables
- Continue to provide support to EASR IPTs and WGs
- Continue to support regular EASR Program Management Reviews
- Continue to support test site preparations
- Support EASR simulator system testing
- Continue to support EASR interface integration with the combat system suite
- Support EASR interface with ships design agent
- Support EASR cost, schedule, and performance management, contract administration, contract oversight, risk identification and risk mitigation
- Continue to provide support to EASR TIMs

Increase in FY18 from PB18 primarily due to contractor's refinement of estimates. Funding reallocated to government engineering services to support test and evaluation efforts, including the contract award for Land Based Test Site (LBTS) construction.

FY 2019 Base Plans:
- Continue analysis and assessment of EASR E&MD contract deliverables
- Continue support of EASR IPTs and WGs
- Continue EASR Program Management Reviews
- Continue support of land-based developmental testing
- Complete support of EASR interface integration with the combat system suite
- Support EASR cost, schedule, and performance management contract administration, contract oversight, risk identification and risk mitigation
- Support EASR TIMs

FY 2019 OCO Plans:
N/A

FY 2018 to FY 2019 Increase/Decrease Statement:

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3236 / *Advanced Radar Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Decrease in FY19 is primarily due to the completion of system engineering activities in FY18.					
Title: PROGRAM MANAGEMENT SUPPORT - EASR	1.432	1.158	1.168	0.000	1.168
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to provide support to EASR IPTs and WGs - Continue to analyze and assess EASR E&MD contract deliverables - Continue to conduct regular EASR Program Management Reviews - Continue to support execution of EASR cost, schedule, and performance management, contract administration, contract oversight, risk identification and risk mitigation - Continue to provide support to EASR TIMs OCO: - N/A ***FY 2019 Base Plans:*** - Support EASR IPTs and WGs - Continue the analysis and assessment of EASR E&MD contract deliverables - Continue EASR Program Management Reviews - Continue support of EASR schedule and performance management contract administration, contract oversight, risk identification and risk mitigation - Support EASR TIMs ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY19 is primarily due to minor program and rate adjustments.					
Accomplishments/Planned Programs Subtotals	53.331	68.665	25.257	0.000	25.257

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3236 / *Advanced Radar Technology*

D. Acquisition Strategy

Advanced Radar Technology (ART)/EASR: The EASR Acquisition is a planned competitive procurement based on a radar specification that incorporates the latest requirements for aviation and amphibious warfare ships, closely conforms to existing combat system interfaces, and includes physical Space Weight and Power (SWAP) Not-to-Exceed (NTE) interface requirements from:
- CVN 79+, LHA, LPD 29+, FFG(X) and LX(R) for Forward-Fit
- CVN, LHA and LHD for back-fit

E. Performance Metrics

EASR E&MD
EXI In-Process Reviews (IPRs)
EASR E&MD System PDR
EASR E&MD System CDR
EASR E&MD Land Based System Integration Testing
EASR Production Authorization

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3236 / *Advanced Radar Technology*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - S2F	C/CPFF	Northrop Grumman - ES : Baltimore, MD	0.608	0.000		0.000		0.000		-		0.000	0.000	0.608	-
Systems Engineering - EASR	C/CPIF	EASR E&MD Contractor - Raytheon : Marborough, MA	12.265	38.846	Dec 2016	45.016	Nov 2017	11.611	Nov 2018	-		11.611	0.000	107.738	-
Systems Engineering - EXI	SS/CPFF	Raytheon : Portsmouth, RI	1.000	1.000	Mar 2017	0.000		0.000		-		0.000	0.000	2.000	-
		Subtotal	13.873	39.846		45.016		11.611		-		11.611	0.000	110.346	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering - EASR	WR	NSWC/DD : Dahlgren, VA	3.137	4.118	Dec 2016	7.669	Oct 2017	5.935	Nov 2018	-		5.935	0.000	20.859	-
Government Engineering - EASR	WR	NSWC/CR : Crane, IN	0.594	1.026	Dec 2016	1.050	Feb 2018	0.708	Nov 2018	-		0.708	0.000	3.378	-
Government Engineering - EASR	WR	NSWC/PHD : Port Huneme, CA	0.381	0.648	Dec 2016	1.270	Feb 2018	0.685	Nov 2018	-		0.685	0.000	2.984	-
Government Engineering - EASR	WR	NSWC/ PHI : Philadelphia, PA	0.057	0.078	Dec 2016	0.132	Nov 2017	0.083	Nov 2018	-		0.083	0.000	0.350	-
Government Engineering - EASR	WR	NRL : Washington, DC	0.293	0.631	Dec 2016	0.524	Nov 2017	0.463	Nov 2018	-		0.463	0.000	1.911	-
Government Engineering - EASR	SS/CPFF	JHU/APL : Baltimore, MD	0.635	3.873	Dec 2016	4.215	Mar 2018	2.704	Dec 2018	-		2.704	0.000	11.427	-
Government Engineering - EASR	WR	SCSC : Wallops Island, VA	0.000	0.235	Dec 2016	0.000		0.347	Nov 2018	-		0.347	0.000	0.582	-
Government Engineering - EASR	WR	NSWC/CD : Bethesda, Maryland	0.160	0.325	Dec 2016	0.114	Nov 2017	0.000		-		0.000	0.000	0.599	-
Engineering Support - EASR	SS/CPIF	SPA (Bridge) : Washington, DC	0.000	0.459	Feb 2017	0.000		0.000		-		0.000	0.000	0.459	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604501N / *Advanced Above Water Sensors*	Project (Number/Name) 3236 / *Advanced Radar Technology*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support - EASR	WR	NAVFAC : Washington, DC	0.000	0.157	Jul 2017	5.842	Feb 2018	0.578	Nov 2018	-		0.578	0.000	6.577	-
Engineering Support - EASR	WR	SPAWAR : San Diego, CA	0.000	0.000		0.449	Feb 2018	0.000		-		0.000	0.000	0.449	-
Engineering Support - EASR	C/CPIF	SPA : Washington, DC	0.000	0.503	Aug 2017	1.226	Nov 2017	0.975	Nov 2018	-		0.975	0.000	2.704	-
		Subtotal	5.257	12.053		22.491		12.478		-		12.478	0.000	52.279	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - S2F	WR	NRL : Washington, DC	0.581	0.000		0.000		0.000		-		0.000	0.000	0.581	-
		Subtotal	0.581	0.000		0.000		0.000		-		0.000	0.000	0.581	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Management Services	C/CPIF	SPA : Washington, DC	0.000	0.465	Aug 2017	0.849	Nov 2017	0.882	Nov 2018	-		0.882	0.000	2.196	-
Travel	Allot	TRAVEL : Washington, DC	0.043	0.080	Nov 2016	0.100	Feb 2018	0.078	Nov 2018	-		0.078	0.000	0.301	-
Support Management Services	C/CPIF	CACI : Washington, DC	0.142	0.170	May 2017	0.100	Dec 2017	0.100	Nov 2018	-		0.100	0.000	0.512	-
Support Management Services	SS/CPIF	SPA (Bridge) : Washington, DC	0.625	0.412	Feb 2017	0.000		0.000		-		0.000	0.000	1.037	-
Support Management Services	C/CPIF	TMB : Washington, DC	0.165	0.223	Jan 2017	0.074	Oct 2017	0.074	Nov 2018	-		0.074	0.000	0.536	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604501N / *Advanced Above Water Sensors*	Project (Number/Name) 3236 / *Advanced Radar Technology*	

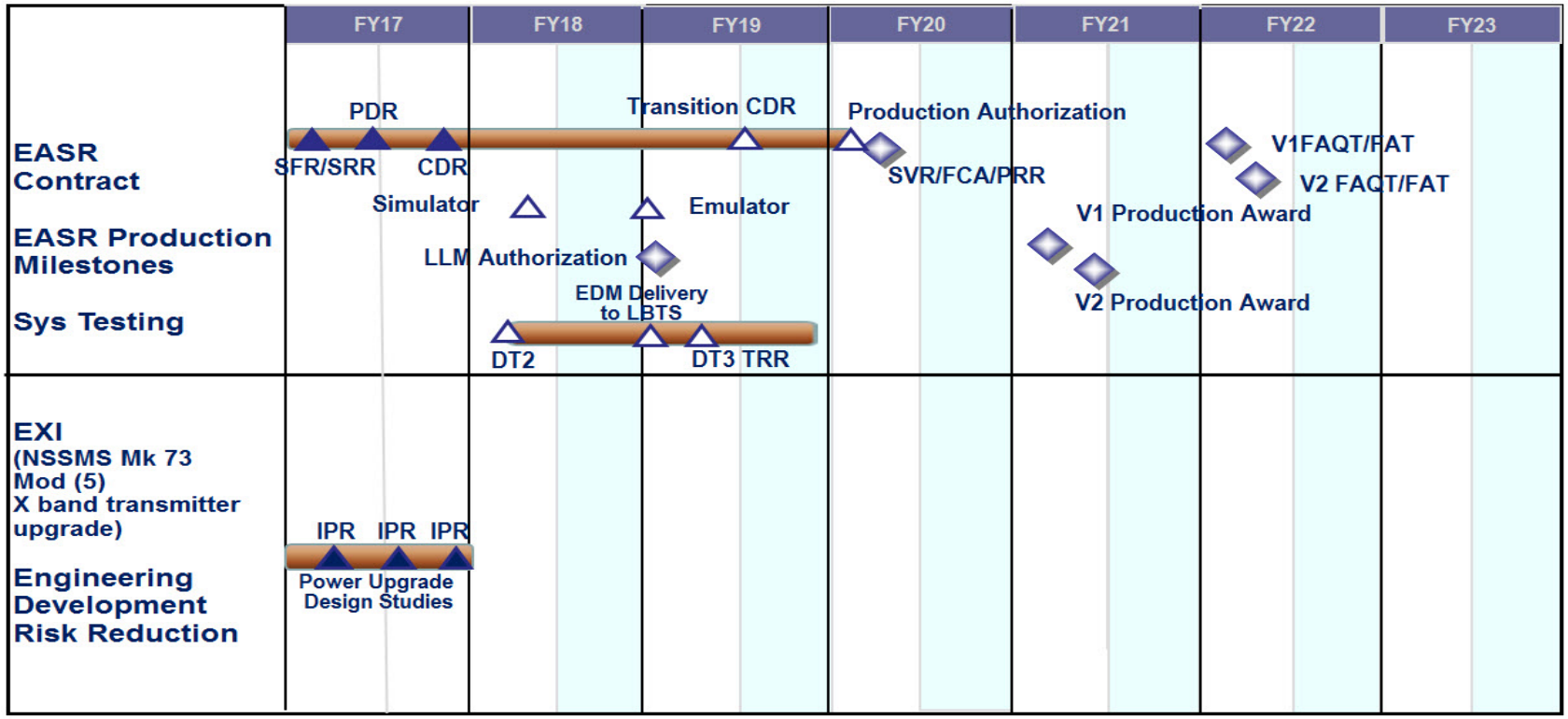
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Management Services	C/CPIF	STRATEGIC INSIGHT : Washington, DC	0.000	0.082	Dec 2016	0.035	Feb 2018	0.034	Dec 2018	-		0.034	0.000	0.151	-
		Subtotal	0.975	1.432		1.158		1.168		-		1.168	0.000	4.733	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	20.686	53.331		68.665		25.257		-		25.257	0.000	167.939	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3236 / *Advanced Radar Technology*



CDR – Critical Design Review
DT- Developmental Testing
FAQT/FAT - First Article Qualification Test / Factory Acceptance Testing
IPR -In-Process Review
LBTS – Land Based Test Site
LLM -Long Lead Material
PDR - Preliminary Design Review
SFR/SRR - System Functional Review / Systems Readiness Review
SVR/FCA/PRR - System Verification Review, 308 Functional Configuration Audit, and Production Readiness Review

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3236 / *Advanced Radar Technology*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3236				
EASR E&MD	1	2017	2	2020
EASR System Functional Review (SFR)/System Requirements Review (SRR)	1	2017	1	2017
EXI Power Upgrade Design Trade Studies In-Process Reviews (IPRs)	1	2017	4	2017
EASR System Preliminary Design Review (PDR)	2	2017	2	2017
EASR System Critical Design Review (CDR)	4	2017	4	2017
Delivery of EASR Simulator	2	2018	2	2018
EASR Developmental Test (DT) 2	2	2018	4	2018
Delivery of EASR Emulator	1	2019	1	2019
EASR Long Lead Material Authorization	1	2019	1	2019
EASR EDM Delivery to LBTS	1	2019	1	2019
EASR Test Rediness Review (TRR) and DT3	2	2019	4	2019
EASR Transition CDR	3	2019	3	2019
EASR System Verification Review (SVR)/Functional Configuration Audit (FCA)/ Production Readiness Review (PRR)	1	2020	1	2020
EASR Production Authorization	2	2020	2	2020
EASR V1 Production Award	1	2021	1	2021
EASR V2 Production Award	2	2021	2	2021
EASR V1 FAQT/FAT	1	2022	1	2022
EASR V2 FAQT/FAT	2	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604501N / *Advanced Above Water Sensors*	Project (Number/Name) 3301 / *Improved Capabilities SPY-1 Radar*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3301: *Improved Capabilities SPY-1 Radar*	14.948	10.443	10.961	7.914	-	7.914	13.198	12.745	11.714	11.951	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Improved Capabilities for SPY-1 Radar: These Reliability, Maintainability, and Availability (RM&A) improvements and solid state technology insertions are intended to reduce cascading failures, mitigate obsolescence issues, and improve reliability in support of Anti-Air Warfare (AAW) and Ballistic Missile Defense (BMD) missions while still providing AN/SPY-1 Radar Total Ownership Cost Reductions. Improvements such as Solid State Insertion will yield reductions in annual fleet maintenance costs and is a top fleet requirement as part of the AEGIS Wholeness initiative. In addition to RM&A improvements, warfighting improvements funded in this line include: Transmitter Noise Cancellation (TNC) development will include hardware/software to counter low radar cross section, low altitude threats. Side Lobe Blanking (SLB) addresses shortfalls in mixed electronic attack environment while in an Integrated Air and Missile Defense (IAMD) mode. The Ship-Based Non-Cooperative Target Recognition (SBNCTR) program phases 2 and 3 will develop algorithms to provide classification for targets. Transition of Advanced Calibration Experiment (ACE) phases 1 and 2 from Baseline 7 into Baseline 9. Electronic Attack (EA) and Rapid Radar Capability Improvement Program (R2CIP) develop solutions for evolving EA threats. FY19 includes completion of ACE Phase 1, continuation of development of ACE Phase 2, SBNCTR Phase 2, TNC, EA improvements, 10KW Amp/CFA Solid State GaN and initiation of Elevated Radar Advanced Calibration Experiment (ERACE).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Improved Capabilities SPY-1 Radar	10.443	10.961	7.914	0.000	7.914
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue development of additional cost reduction initiatives - Continue TNC development and conduct SDR - Perform requirements analysis and specification updates for Electronic Attack Improvements - Continue requirements development and design reviews for SBNCTR Phase 2 - Continue Radar IPT support for all baselines - Conduct ACE Phase 1 Demo - Conduct ACE Phase 1 testing - Initiate Elevated Radar Advanced Calibration Experiment (ERACE) development					
FY 2019 Base Plans: - Continue development of additional cost reduction initiatives - Continue TNC development and conduct PDR and CDR					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3301 / *Improved Capabilities SPY-1 Radar*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate Electronic Attack Improvements Technology Development - Continue requirements development and design reviews for SBNCTR Phase 2 - Continue Radar IPT support for all baselines - Conduct ACE Phase 1 Certification and complete development - Continue ERACE development and conduct demo/testing ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY19 funding request was reduced by $3.050M to account for the availability of prior year execution balances and rate adjustments.					
Accomplishments/Planned Programs Subtotals	10.443	10.961	7.914	0.000	7.914

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2980: *Items Less Than $5M*	47.664	105.292	148.350	-	148.350	171.540	205.578	162.820	155.744	536.969	26,327.382
• O&MN/1C2C/0702228N: *O&M,N AEGIS Wholeness SPY Transmitter Reliability*	4.040	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.948
• O&MN/1C1C/0702228N: *O&M,N AEGIS Wholeness SPY Transmitter Reliability*	0.000	4.262	4.324	-	4.324	4.435	4.532	4.625	4.717	Continuing	Continuing

Remarks

D. Acquisition Strategy

Improved Capabilities SPY-1 Reliability, Maintainability, and Availability (RM&A) will design and develop an Ordnance Alterations (ORDALT) Package for fixes and modifications to known transmitter, microwave tube (MWT), and logistic shortcomings (also includes the MK-99 Continuous Wave Illuminator (CWI) MWT. Investment in development of SPY-1 RM&A improvements to address failure mechanisms and improve reliability is planned to continue beyond the FYDP. Radar capability upgrades (SBNCTR, ACE and ERACE) and reliability improvements will be incorporated into Baseline 7, Baseline 9 and follow.

E. Performance Metrics

- Complete 10KW GaN-based Driver/Pre-Driver studies/investigations

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3301 / *Improved Capabilities SPY-1 Radar*

- Complete GaN-based Driver/Pre-Driver studies/investigations
- Complete Advanced Calibration Experiment (ACE) Baseline (BL) 9 Phase 1 Demo
- Complete Transmitter Noise Cancellation (TNC) SDR
- Complete Electronic Attack (EA) Studies and Rapid Radar Capability Program (R2CIP) concept development
- Complete ACE BL 9 Phase 1 testing
- Complete TNC Preliminary Design Review (PDR)
- Complete EA studies and R2CIP requirements analysis and spec updates
- Complete SBNCTR integration and test
- Complete TNC Critical Design Review (CDR)
- Complete Sidelobe Blanking (SLB) requirements analysis
- Complete SBNCTR EA
- Complete ACE Phase 1 certification and development
- Complete EA and R2CIP Technology Development
- Complete TNC integration and test
- Complete 10KW Amplifier/CFA Solid State GaN Technology Development
- Complete TNC merge to Common Source Library (CSL)
- Complete ACE Phase 2 requirements definition
- Complete ACE Phase 2 Demo
- Complete ACE Phase 2 certification testing
- Complete EA improvements and R2CIP implementation and testing
- Complete SBNCTR Phase 3 requirements definition
- Complete ERACE requirements definition
- Complete ERACE Demo
- Complete ERACE Testing
- Complete ERACE Certification

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3301 / *Improved Capabilities SPY-1 Radar*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SYSTEM ENGINEERING	MIPR	Office of Naval Research : Arlington, VA	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
SYSTEM ENGINEERING	C/CPFF	Raytheon : Sudbury, MA	1.941	0.000		0.000		0.000		-		0.000	0.000	1.941	-
SYSTEM ENGINEERING	WR	NSWC/Crane, IN : Crane, IN	12.007	0.908	Nov 2016	3.387	Nov 2017	1.580	Nov 2018	-		1.580	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	SS/CPFF	Lockheed Martin : Moorestown, NJ	0.000	5.046	Feb 2017	3.750	Jan 2018	3.008	Dec 2018	-		3.008	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	SS/CPFF	AEGIS Techrep : Moorestown, NJ	0.000	0.439	Mar 2017	0.341	Nov 2017	0.261	Dec 2018	-		0.261	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	SS/FP	APL/JHU : Laurel, MD	0.000	0.465	Jan 2017	0.370	Feb 2018	0.260	Nov 2018	-		0.260	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	CSCS : Dahlgren, VA	0.000	0.194	Jun 2017	0.148	Jun 2018	0.125	Jun 2019	-		0.125	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	NRL : Washington, DC	0.000	0.375	Nov 2016	0.361	Nov 2017	0.301	Nov 2018	-		0.301	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	MIPR	MIT/LL : Lexington, MA	0.000	0.450	Mar 2017	0.450	Mar 2018	0.400	Mar 2019	-		0.400	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	NSWC DD : Dahlgren, VA	0.000	1.674	Nov 2016	1.542	Nov 2017	1.392	Nov 2018	-		1.392	Continuing	Continuing	Continuing
SYSTEM ENGINEERING	WR	NSWC/PHD : Port Hueneme, CA	0.000	0.195	Nov 2016	0.149	Nov 2017	0.124	Nov 2018	-		0.124	Continuing	Continuing	Continuing
		Subtotal	14.948	9.746		10.498		7.451		-		7.451	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	PEOIWS2 : Washington, DC	0.000	0.010	Feb 2017	0.020	Jan 2018	0.020	Jan 2019	-		0.020	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3301 / *Improved Capabilities SPY-1 Radar*

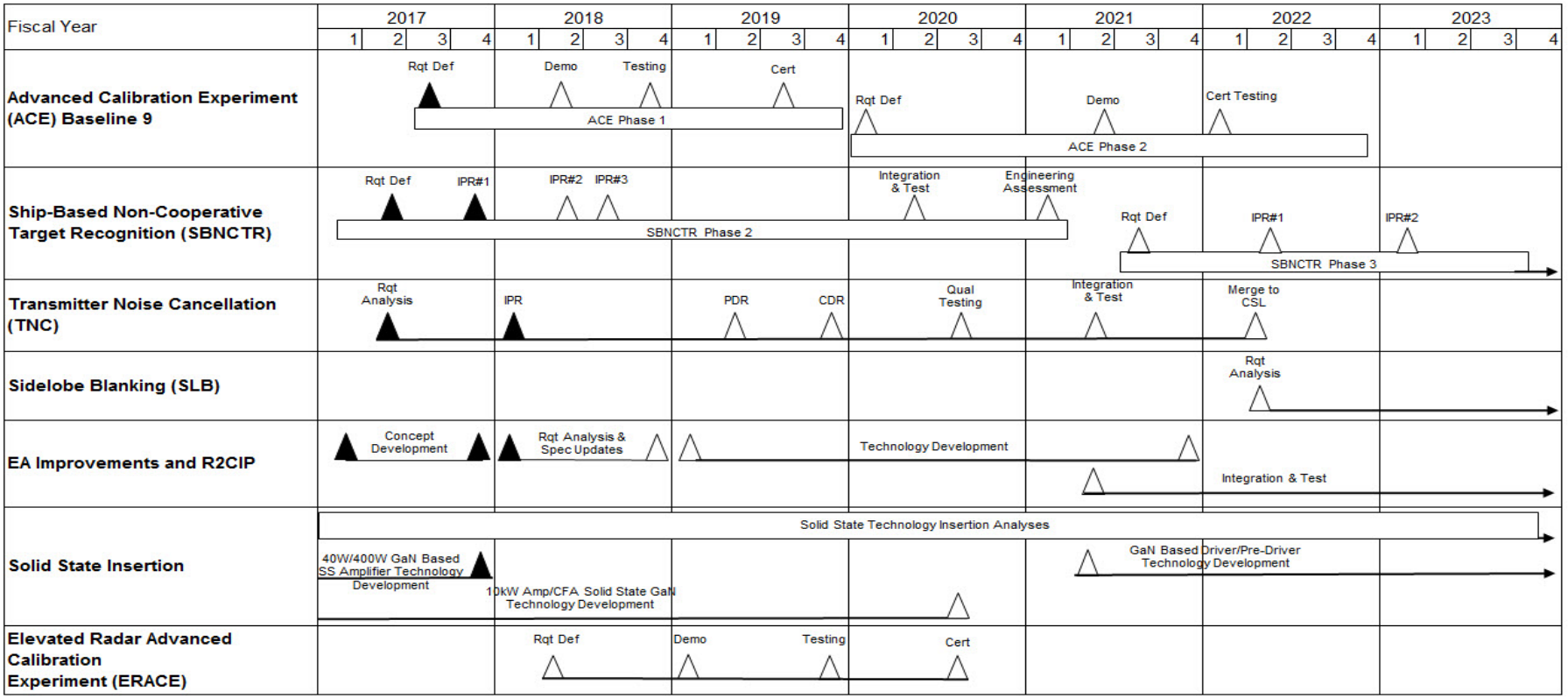
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Management Services	C/CPIF	SPA : Washington, DC	0.000	0.506	Aug 2017	0.443	Nov 2017	0.443	Nov 2018	-		0.443	0.000	1.392	-
Support Management Services	SS/CPIF	SPA (Bridge) : Washington, DC	0.000	0.181	Feb 2017	0.000		0.000		-		0.000	0.000	0.181	-
		Subtotal	0.000	0.697		0.463		0.463		-		0.463	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.948	10.443		10.961		7.914		-		7.914	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3301 / *Improved Capabilities SPY-1 Radar*



SBNCTR PHASE 3, SLB, EA Improvements and R2CIP, and Solid State Insertion continue beyond the FYDP.

Acronyms:

CFA: Crossed Field Amplifier	GaN: Gallium Nitride
CDR: Critical Design Review	IPR: In-Progress Review
CSL: Common Source Library	PDR: Preliminary Design Review
EA: Electronic Attack	R2CIP: Rapid Radar Capability Improvement Program
ERACE: Elevated Radar ACE	SS: Solid State

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3301 / *Improved Capabilities SPY-1 Radar*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3301				
40W/400W GaN Based Solid State Amplifier Technology Development	1	2017	4	2017
Solid State Technology Insertion Analyses	1	2017	4	2023
10KW GaN Amplifier/CFA Solid State Technology Development	1	2017	3	2020
EA Improvements and R2CIP Concept Development	1	2017	4	2017
SBNCTR - Rqts Definition	2	2017	2	2017
TNC Requirements Analysis	2	2017	2	2017
ACE Phase 1 Requirements Definition	3	2017	3	2017
SBNCTR Phase 2 IPR #1	4	2017	4	2017
TNC IPR	1	2018	1	2018
EA Improvements and R2CIP Rqt Analysis & Spec Updates	1	2018	4	2018
ACE Phase 1 Demo	2	2018	2	2018
SBNCTR Phase 2 IPR #2	2	2018	2	2018
ERACE Requirements Definition	2	2018	2	2018
SBNCTR Phase 2 IPR #3	3	2018	3	2018
ACE Phase 1 Testing	4	2018	4	2018
EA Improvements and R2CIP Technology Development	1	2019	4	2021
ERACE Demo	1	2019	1	2019
TNC PDR	2	2019	2	2019
ACE Phase 1 Certification	3	2019	3	2019
TNC CDR	4	2019	4	2019
ERACE Testing	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604501N / *Advanced Above Water Sensors*	**Project (Number/Name)** 3301 / *Improved Capabilities SPY-1 Radar*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ACE Phase 2 Requirements Definition	1	2020	1	2020
SBNCTR Phase 2 Integration & Test	2	2020	2	2020
ERACE Certification	3	2020	3	2020
TNC Qualification Testing	3	2020	3	2020
SBNCTR Phase 2 Engineering Assessment	1	2021	1	2021
TNC Integration & Test	2	2021	2	2021
ACE Phase 2 Demo	2	2021	2	2021
EA Improvements and R2CIP Integration and Test	2	2021	4	2023
GaN based Driver/Pre-Driver Technology Development	2	2021	4	2023
SBNCTR Phase 3 Requirements Definition	3	2021	3	2021
ACE Phase 2 Certification Testing	1	2022	1	2022
TNC Merge to Common Source Library	2	2022	2	2022
SLB Requirements Analysis	2	2022	4	2023
SBNCTR Phase 3 IPR #1	2	2022	2	2022
SBNCTR Phase 3 IPR #2	1	2023	1	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604503N *I SSN-688 & Trident Modernization*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,501.188	120.261	130.981	126.932	-	126.932	110.805	102.958	103.720	111.116	Continuing	Continuing
0219: *Sub Sonar Improvement (ENG)*	961.731	65.194	86.718	67.030	-	67.030	61.575	60.651	61.507	62.781	Continuing	Continuing
0742: *Sub Integrated Ant System*	306.311	25.373	15.652	15.426	-	15.426	14.486	14.326	13.779	14.077	Continuing	Continuing
0775: *Submarine Supt Equip Prog*	14.615	13.118	9.117	28.408	-	28.408	15.206	14.906	13.985	14.272	Continuing	Continuing
1411: *Sub Tact Comm System*	218.531	9.806	19.494	16.068	-	16.068	19.538	13.075	14.449	19.986	Continuing	Continuing
9999: *Congressional Adds*	0.000	6.770	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.770

A. Mission Description and Budget Item Justification

SSN-688 & Trident Modernization delivers block updates to Submarine Sonar systems, provides improved secure voice and data communications capabilities, develops improved Submarine Electronic Warfare (EW) systems, and provides a fully integrated and tested Common Submarine Radio Room (CSRR). These development activities ensure all Submarine Classes maintain clear acoustical, tactical, and operational superiority over Submarines and Surface Combatants in Joint Littoral Warfare, Joint Intelligence Surveillance Reconnaissance (ISR), Indications and Warnings, Information Operations including Cyber, and Special Operations Force (SOF) support. Current developments are focused on supporting Joint Littoral Warfare, Regional Sea Denial, Strike Group Support, Diesel Submarine Detection, Joint Surveillance and Peacetime Engagement, Space and Electronic Warfare, Intelligence Collection, Maritime Protection, and Joint Strike.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	117.476	130.981	122.278	-	122.278
Current President's Budget	120.261	130.981	126.932	-	126.932
Total Adjustments	2.785	0.000	4.654	-	4.654
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.199	0.000			
• Program Adjustments	0.000	0.000	6.185	-	6.185
• Rate/Misc Adjustments	0.000	0.000	-1.531	-	-1.531

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604503N *I SSN-688 & Trident Modernization*			
• Congressional General Reductions Adjustments	-0.016	-	-	-	-
• Congressional Directed Reductions Adjustments	-1.000	-	-	-	-
• Congressional Add Adjustments	7.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Program Increase*	6.770	0.000
Congressional Add Subtotals for Project: 9999	6.770	0.000
Congressional Add Totals for all Projects	6.770	0.000

Change Summary Explanation

The FY 2019 funding request was reduced by $6.6 million to account for the availability of prior year execution balances. FY 2019 funding decrease was offset by $6.57 million to provide funding for increased BRR-6 Enhancement Development and Coherent Electronic Attack for Submarines. The FY 2019 request was also reduced by $3.57 million to account for various miscellaneous/rate adjustments. This FY 2019 funding decrease was offset by $8.25 million to provide increased funding for Submarine Imaging and Electronic Warfare Development activities.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 0219 / *Sub Sonar Improvement (ENG)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0219: *Sub Sonar Improvement (ENG)*	961.731	65.194	86.718	67.030	-	67.030	61.575	60.651	61.507	62.781	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program delivers block updates to Sonar Systems installed on SSN 688, 688I, SSN 21, VIRGINIA, SSBN, and SSGN Class Submarines to maintain clear acoustical, tactical, and operational superiority over Submarines and Surface Combatants in all scenarios through detection, classification, localization, and contact following.

Acoustics Rapid COTS Insertion (A-RCI) provides multi-phased evolutionary development geared toward addressing acoustic superiority issues through the rapid introduction of interim development products applicable to all Classes of Submarines.
- A-RCI Phase I and II introduced Towed Array processing improvements
- Phase III introduced Spherical Array processing improvements
- Phase IV provided High Frequency (HF) Array processing improvements for SSN 688I, SSGN, VIRGINIA, and SSN 21 Class Submarines.

As part of the Navy's plan to maintain acoustic superiority for in-service submarines, a joint cooperative effort was established to deliver annual Advanced Processing Builds (APBs) to prevent obsolescence and deliver ongoing capability improvements.
- Capabilities in the APBs will be integrated as part of A-RCI certified systems.
- Development of the Large Vertical Array (LVA) will improve detection and enhanced tactical situational awareness capability for tracking targets of interest, and supports acoustic superiority objectives for the VIRGINIA and OHIO Cass Submarines.

Sensor Efforts provide increased operational capabilities for littoral operations, situational awareness, and reliability improvements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: APB Productionization	11.904	12.724	12.519	0.000	12.519
Articles:	-	-	-	-	-
Description: APB Productionization provides for the transition of APB capability improvements to the Fleet for integration, testing and formal certification.					
FY 2018 Plans: -Continue Advanced Processing Build (APB) Sea Testing, Integration, and Certification.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Transition APB software from development to A-RCI for integration, testing, and formal certification. -Incorporate conversion of the SSBN legacy sonar system to the TI/APB model and the introduction of in-board signal processing associated with the Large Vertical Array (LVA). ***FY 2019 Base Plans:*** -Continue Advanced Processing Build (APB) Sea Testing, Integration, and Certification. -Transition APB software from development to A-RCI for integration, testing, and formal certification. -Ensure continued transition of the SSBN legacy sonar system to the TI/APB model and the incorporation of in-board signal processing associated with the Large Vertical Array (LVA). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 APB Productionization efforts reflect the integration of the TI-18 baseline for SSGN Class Submarines and the completion of the TI-16 baseline for SEAWOLF and VIRGINIA Class Submarines resulting in a funding decrease.					
Title: Integration and Testing	31.987	37.128	34.056	0.000	34.056
Articles:	-	-	-	-	-
Description: Integration and Testing provides support to integrate and test APB's into all Submarine Classes containing multiple sensor systems. ***FY 2018 Plans:*** -Support Advanced Processing Builds installed on SSN 688I, SSN 688, SSN 21, SSGN 726, SSBN, and VA Class Submarines. -Incorporate the integration and testing associated with the refresh of technology and assimilation of capability required for conversion of the SSBN legacy sonar system to the TI/APB model. -Incorporate the integration and testing associated with the introduction of signal processing in support of the Large Vertical Array (LVA). ***FY 2019 Base Plans:*** -Support Advanced Processing Builds installed on SSN 688I, SSN 688, SSN 21, SSGN 726, SSBN, and VA Class Submarines.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Continue the incorporation of integration and testing associated with the conversion of the SSBN legacy sonar system to the TI/APB model; as well as, signal processing in support of the Large Vertical Array (LVA). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 finalizes the development of the baseline in-board signal processing requirements for the Large Vertical Array (LVA) resulting in a decrease in Integration and Testing requirements.					
Title: SSBN Combat System Modernization ***Articles:*** ***Description:*** SSBN Combat System Modernization develops and completes the incorporation of the APB/TI model into SSBN combat systems. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A	2.050 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Large Vertical Array (LVA) ***Articles:*** ***Description:*** Provides funding for the development of Large Vertical Array (LVA) capability in the areas of detection and tracking for back-fit installation on VIRGINIA Class and OHIO Class Submarines. ***FY 2018 Plans:*** -Continue development of Large Vertical Array (LVA) acoustic modules; to include acoustic sensors, array material, outboard electronics, fairings, and associated cabling, to effectively incorporate the required capabilities into the APB/TI model.	13.265 -	33.283 -	16.800 -	0.000 -	16.800 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Continue development and initiate fabrication of 2 mechanical fixtures required to manufacture, transport, and install an LVA shipset on a Submarine. ***FY 2019 Base Plans:*** -Finalize development of Large Vertical Array (LVA) acoustic modules; to include acoustic sensors, array material, outboard electronics, fairings, and associated cabling -Finalize development of mechanical fixtures (required to manufacture, transport, and install an LVA ship-set on a submarine), to effectively incorporate the required capabilities into the TI/APB model for back-fit modernization. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 finalizes the development of the Large Vertical Array (LVA) resulting in a decrease in LVA development requirements.					
Title: TB-29X Development ***Articles:*** ***Description:*** Provides funding for the development of TB-29A equivalent Thin Line Array with long range detection and tracking with improved reliability, using improved telemetry. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A	2.475 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: A-RCI Acoustic Superiority Integration ***Articles:*** ***Description:*** Maintain Acoustic Superiority for In-service Submarines to deliver bi-annual Advance Processing Builds (APBs) to prevent obsolescence and deliver emerging capability improvements for current and future threats.	3.513 -	3.583 -	3.655 -	0.000 -	3.655 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: -Continue development of emerging capability improvements for current and future threats by supporting development, integration, and testing of emerging capability improvements in passive long range detection/wide area search for current and future threats in support of Navy SSN/SSBN Acoustic Superiority initiatives. ***FY 2019 Base Plans:*** -Continue development of emerging capability improvements for current and future threats by supporting development, integration, and testing of emerging capability improvements in passive long range detection/wide area search for current and future threats in support of Navy SSN/SSBN Acoustic Superiority initiatives. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 integrates additional software enabled capability enhancements across multiple Submarine Classes resulting in a funding increase.					
Accomplishments/Planned Programs Subtotals	65.194	86.718	67.030	0.000	67.030

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2150: *SSN Acoustic Equipment*	288.265	331.053	318.189	-	318.189	378.968	441.021	427.711	499.564	Continuing	Continuing

Remarks

D. Acquisition Strategy

Acoustic Systems:
-A-RCI utilizes an open architecture and Commercial Off-the-Shelf (COTS) products in support of new and upgraded sonar systems.
-Program Reviews with the Milestone Decision Authority (MDA) are conducted granting approval for the contract production options.

Large Vertical Array (LVA):
-Performance specification-based contract in support of LVA to enhance SSN/SSBN platform capability and situational awareness.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*

E. Performance Metrics

-The A-RCI program will modernize approximately 8-12 SSNs per year through executing bi-annual software Advanced Processor Builds (APBs) and bi-annual Technical Insertions (TIs).

-Beginning with FY 2017 installations, the A-RCI program will modernize approximately 2-3 SSBNs per year through bi-annual APBs/TIs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPIF	LMC : Manassas, VA	347.471	13.217	Dec 2016	15.647	Dec 2017	15.386	Dec 2018	-		15.386	Continuing	Continuing	Continuing
Ancillary Hardware Development	SS/CPFF	ARL University of Texas : Austin, TX	37.403	3.232	Mar 2017	3.468	Mar 2018	3.371	Mar 2019	-		3.371	Continuing	Continuing	Continuing
Systems Engineering	SS/CPFF	Johns Hopkins APL : Baltimore, MD	39.525	3.251	Dec 2016	3.488	Dec 2017	3.391	Dec 2018	-		3.391	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	LMC : VA - Keyport	36.260	3.439	Jan 2017	3.690	Jan 2018	3.591	Jan 2019	-		3.591	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPIF	Progeny Systems : Manassas, VA	64.004	6.635	Jan 2017	7.119	Jan 2018	6.984	Jan 2019	-		6.984	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC : Newport, RI	172.436	6.115	Dec 2016	6.561	Dec 2017	5.453	Dec 2018	-		5.453	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Carderock, MD	28.312	2.910	Dec 2016	3.122	Dec 2017	2.060	Dec 2018	-		2.060	Continuing	Continuing	Continuing
TB-29X Development	C/CPIF	L-3 CSC : Millersville, MD	13.200	2.475	Mar 2017	0.000		0.000		-		0.000	0.000	15.675	-
LVA Development	C/CPIF	Electric Boat : Groton, CT	0.000	13.265	Nov 2016	33.283	Nov 2017	16.800	Nov 2018	-		16.800	0.000	63.348	-
		Subtotal	738.611	54.539		76.378		57.036		-		57.036	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Software Development	C/CPIF	General Dynamics, AIS : Fairfax, VA	159.945	5.344	Dec 2016	5.184	Dec 2017	5.028	Dec 2018	-		5.028	Continuing	Continuing	Continuing
Primary Software Development	C/CPFF	Sedna Digital, : Manassas, VA	36.599	4.041	Dec 2016	3.920	Dec 2017	3.802	Dec 2018	-		3.802	Continuing	Continuing	Continuing
		Subtotal	196.544	9.385		9.104		8.830		-		8.830	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 0219 / *Sub Sonar Improvement (ENG)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test and Evaluation	WR	OPTEVFOR : Norfolk, VA	10.281	0.500	Dec 2016	0.485	Dec 2017	0.470	Dec 2018	-		0.470	Continuing	Continuing	Continuing
		Subtotal	10.281	0.500		0.485		0.470		-		0.470	Continuing	Continuing	N/A

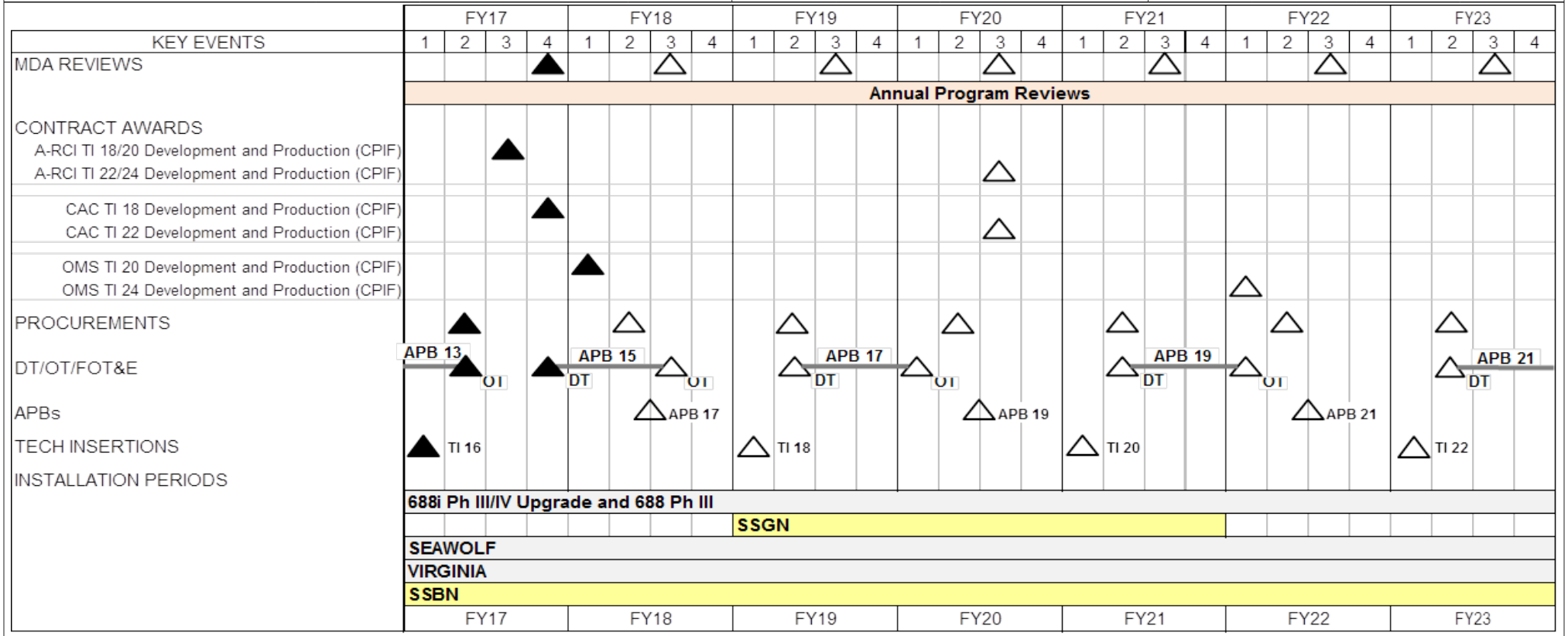
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support Services	C/FFP	Alion, BAH, AECOM : Washington, DC	13.955	0.673	Dec 2016	0.657	Dec 2017	0.600	Dec 2018	-		0.600	Continuing	Continuing	Continuing
Travel	WR	NAVSEA : Washington, DC	2.340	0.097	Dec 2016	0.094	Dec 2017	0.094	Dec 2018	-		0.094	Continuing	Continuing	Continuing
		Subtotal	16.295	0.770		0.751		0.694		-		0.694	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	961.731	65.194		86.718		67.030		-		67.030	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*



Completed Milestone

Upcoming Milestone

SSN Installation Period

SSGN/SSBN Installation Period

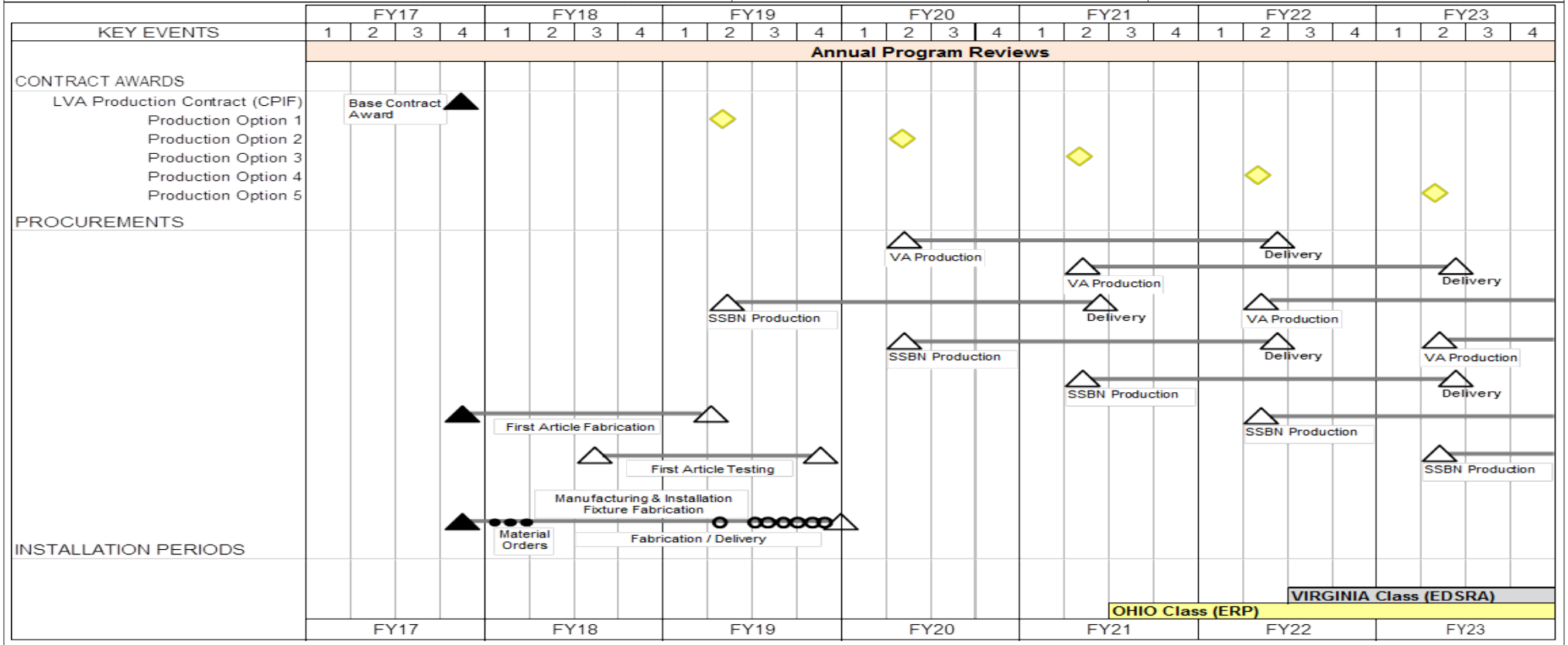
APB: Advanced Processing Builds

A-RCI: Acoustic – Rapid Commercial Off the Shelf (COTS) Insertion

CAC: Common Acoustic Cabinet

OMS: Ownship Monitoring System

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*



KEY:

- Completed Milestone
- Upcoming Milestone
- Production Option
- **SSN Installation Period**
- **SSBN Installation Period**

LVA: Large Vertical Array

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0219 / *Sub Sonar Improvement (ENG)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0219				
ACOUSTICS	1	2017	4	2023
---Acquisition Milestones - Acoustics	4	2017	3	2023
---Annual Program Review	1	2017	4	2023
---Contract Awards - Acoustics	3	2017	4	2020
---Procurements - Acoustics	2	2017	2	2023
---DT/OT/FOT&E Tests	1	2017	4	2023
---APB Deliveries	3	2018	3	2022
---Tech Insertions	1	2017	1	2023
---Installation Periods	1	2017	4	2023
LARGE VERTICAL ARRAY	4	2017	1	2021
---Contract Award - Large Vertical Array	4	2017	4	2017
---Acquisition Milestones - Large Vertical Array	1	2018	4	2019
---Procurements - Large Vertical Array	1	2018	4	2019
---Production	2	2019	1	2021
---First Article Testing	3	2018	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 0742 / *Sub Integrated Ant System*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0742: *Sub Integrated Ant System*	306.311	25.373	15.652	15.426	-	15.426	14.486	14.326	13.779	14.077	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The programs funded under the Submarine Integrated Antenna System project (0742) provide Nuclear Submarines (SSN), Ballistic Missile Submarines (SSBN) and Guided Missile Submarines (SSGN) with improved communications capabilities to support future Joint, Allied, and Naval operations. These efforts provide for the development and testing of submarine antennas designed to meet emerging submarine requirements: (a) Increased antenna performance while operating at speed and depth, (b) Increased stealth capability of existing and future antennas, (c) Antenna compatibility with new waveforms and transceiver equipment, (d) Increased capabilities of antennas and their interface to the External Communications System, and (e) Improved antenna design to reduce Total Ownership Cost. Specifically, this project funds research and development for submarine antennas including (1) Outboard Electronics (OE)-538/BRC Multi-Function Antenna, (2) OE-562 Submarine High Data Rate (SubHDR), (3) Advanced High Data Rate (AdvHDR) (4) Towed Buoy Antenna (TBA)(AN/BRR- 6/6B) (5) Antenna Improvements (6) Transition Engineering.

The OE-538/BRC Multi-Function Antenna Program supports radio frequency communications from Very Low Frequency (VLF) to Ultra High Frequency (UHF) and provides Identification Friend and Foe (IFF), Global Positioning System (GPS), Mobile Users Objective System (MUOS), Tactical Data Link (TDL) via Link 16, and Iridium capabilities for all submarine classes across all submarine mission areas.

The SubHDR program provides the submarine fleet with Extremely High Frequency (EHF) Low Data Rate (LDR), EHF Medium Data Rate (MDR), EHF Extended Data Rate (XDR), military Super High Frequency (SHF) , and enables reception of the Global Broadcast Service (GBS).

The AdvHDR program develops communications methods that will improve communications and reduce the detectability of the submarines by the adversary utilizing the Optical Communications Project Arrangement with United Kingdom.
The program also researches the Tactically Oriented Tech Insertion Mast (TOTIM), which decreases the size of the imaging sensors, increases modularity, sensor capabilities and supports mission specific payloads.

The TBA AN/BRR-6/6B is installed on OHIO class SSBN submarines and a variant of AN/BRR-6 will be the TBA for COLUMBIA class. Each boat's towed communications buoys (2 each) support its primary mission to receive Emergency Action Messages (EAMs), a critical component of the Navy's Nuclear Command, Controls, and Communications (NC3).

The Antenna Improvements project provides for Reliability, Maintainability and Availability (RMA) improvements and continued Preplanned Product Improvement (P3I) developments in support of current and future submarine antenna applications.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

The Transition Engineering program focuses on technology development and assessment to support Fourth Generation Undersea Warfare objectives. Principal objective will be to complete the Maritime Information System (MIS) Analysis of Alternatives (AoA).

JUSTIFICATION FOR BUDGET ACTIVITY:

FY19 Transition Engineering: Continue development of future undersea communications capabilities in support of Fourth Generation Undersea Warfare.
FY19 Outboard Electronics (OE)-538: Complete OT on operational submarine in support of Full Rate Production (FRP).
FY19 SubHDR: Continue development of Reliability Maintainability, and Availability, (RMA) components identified by research and analysis to maintain Ao throughout the life of the system. FY19 efforts are funded by prior year under-execution funds.
FY19 AdvHDR: Continue Optical Communications Project Arrangement with United Kingdom to reduce the detectability of the submarines by the adversary. Continue research and analysis into communications (COMMS) payloads for the Tactically Oriented Technology Insertion Mast (TOTIM) to improve Low Probability of Detection (LPD).
FY19 Towed Buoy Antenna (TBA)(AN/BRR-6/6B): Provides design specification, component development, system integration, and testing to improve system performance (measured by operational availability Ao) and reliability (measured by mean time between failures MTBF); of buoy shape, combined Radio Frequency (RF) and Depth Canisters, Antenna and Amplifier Improvements, and Inertial Measurement Unit (IMU).
FY19 Antenna Improvements: Continue RMA and P3I improvements in support of current and future submarine antenna applications.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Transition Engineering	4.047	2.577	2.627	0.000	2.627
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue concept engineering, new technology evaluations, and assessments in support of current and future Undersea Warfare. - Continue development of future undersea communication capabilities in support of Fourth Generation Undersea Warfare. - Continue development of the Links of the Chain as a plug in for Virtual Worlds in support of simulation of the Undersea Architecture. - Continue development of Undersea Constellation Security Classification Guide. - Commence development of Subsea and Seabed Warfare (SSW) Initial Capabilities Document (ICD) - Commence Maritime Information System (MIS) Analysis of Alternatives (AoA).					
FY 2019 Base Plans: - Continue concept engineering, new technology evaluations, and assessments in support of current and future Undersea Warfare.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue development of future undersea communication capabilities in support of Fourth Generation Undersea Warfare. - Continue development of the Links of the Chain as a plug in for Virtual Worlds in support of simulation of the Undersea Architecture. - Continue development of Subsea and Seabed Warfare (SSW) Initial Capabilities Document (ICD) - Complete development of the Undersea Constellation Security Classification Guide. - Complete Maritime Information System (MIS) Analysis of Alternatives (AoA). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Increase in budget between FY18 and FY19 accounts only for inflation.					
Title: Outboard Electronics (OE)-538 ***Articles:*** ***FY 2018 Plans:*** - Complete Developmental Test (DT) on operational submarine in support of Full Rate Production (FRP). - Complete development/update of required FRP acquisition documents. - Continue preparation for Operational Test (OT) in support of FRP. ***FY 2019 Base Plans:*** - Complete OT on operational submarine in support of FRP. - Complete FRP decision review and achieve Initial Operational Capability (IOC). Note: Due to submarine availability for OE-538A, DT delayed from 2QFY17 to 4QFY18 and OT delayed from 3QFY17 to 1QFY19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Decrease of $0.1 from FY18 to FY19 is due to a reduction in required tasking for the fiscal year. The only remaining task will be for the completion of OT in 1QFY19.	0.648 -	0.200 -	0.100 -	0.000 -	0.100 -
Title: Submarine High Data Rate (SubHDR) Pre-Planned Product Improvement (P3I)	9.653	2.288	0.253	0.000	0.253

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue development of Reliability Maintainability, and Availability, (RMA) components identified by research and analysis to maintain Ao throughout the life of the system, which includes the continuation of the Multi-Volt Power Supply (MVPS) development and commencing the Mast Motion Sensor (MMS) development. ***FY 2019 Base Plans:*** - Continue oversight of development of Reliability Maintainability, and Availability, (RMA) components identified by research and analysis to maintain Ao throughout the life of the system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - The FY19 funding request was reduced by $2.035M to account for the availability of prior year execution balances. Remaining FY19 funding will provide for government oversight of FY18 funded contract work.					
Title: Advanced High Data Rate (AdvHDR)	3.033	3.408	3.483	0.000	3.483
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue Optical Communications Project Arrangement with United Kingdom. - Commence Low Probability of intercept/Low Probability of Detection (LPI/LPD) technology development phase. (This effort has been moved to project unit 1411 and referred to as "Undersea Assured Command and Control (UAC2) technology development phase 1) - Continue research and analysis into communications payloads for the TOTIM to improve LPD. ***FY 2019 Base Plans:*** - Continue Optical Communications Project Arrangement with United Kingdom. - Continue research and analysis into communications payloads for the TOTIM to improve LPD. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Increase in budget between FY18 and FY19 accounts only for inflation.					
Title: Towed Buoy Antenna (AN/BRR-6/6B)	5.472	3.681	6.320	0.000	6.320

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
FY 2018 Plans: - Commence development for cybersecurity vulnerability detection and hardening. - Continue design specification, component development, system integration, and testing for reliability improvements of buoy shape and radio frequency and depth canisters. - Complete design specification, component development, system integration, and testing for reliability improvements of antenna and amplifiers and Inertial Measurement Unit (IMU). - Continue support for Towed Buoy Antenna BRR-6 Program on OHIO and COLUMBIA Class providing program, contract, logistics and system engineering management. ***FY 2019 Base Plans:*** - Complete development for cybersecurity vulnerability detection and hardening. - Continue design specification, component development, system integration, and testing for reliability improvements of buoy shape and radio frequency and depth canisters. - Continue support for Towed Buoy Antenna BRR-6 Program on OHIO and COLUMBIA Class providing program, contract, logistics and system engineering management. - Commence design specification, component development, system integration, and testing for reliability improvements of High-lift Auxiliary Wire capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - The $2.6M increase from FY18 to FY19 is to support the COLUMBIA Class delivery schedule. A recoloring of OPN to RDT&E occurred in FY19 to provide developmental engineering efforts, including Control Software design, Seated Switch Redesign, and Tow Cable Strength and Throughput design, while also ensuring full maturity of the buoy shape, radio frequency canister and depth sensor canister required to meet the COLUMBIA Class delivery schedule.					
Title: Antenna Improvements	2.520	3.498	2.643	0.000	2.643
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue P3I investigation and RMA development efforts for legacy antennas.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
. ***FY 2019 Base Plans:*** - Continue P3I investigation and RMA development efforts for legacy antennas. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - The decrease from FY18 to FY19 accounts for the reduction of AN/BRA-24 reliability improvement design due to the transition from development to production. These reliability improvements are required to resolve operational availability issues.					
Accomplishments/Planned Programs Subtotals	25.373	15.652	15.426	0.000	15.426

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/3130: *Submarine Communication Equipment*	62.305	86.204	78.580	-	78.580	73.630	64.510	62.011	60.158	Continuing	Continuing

Remarks

D. Acquisition Strategy

Program Milestones (MS):
Outboard Electronics (OE)-538: 2nd QTR FY19 Full Rate Production (FRP) Decision Review.

Test and Evaluation (T&E) Milestones:
OE-538: 4th QTR FY18 Developmental Test (DT) for FRP; 1st QTR FY19 Operational Test (OT) for FRP.

E. Performance Metrics

FY19 AdvHDR: Optical Communications (OCOMMS) Project Arrangement and Tactically Oriented Technology Insertion Mast (TOTIM) Communications Payload performance specifications.
FY19 TBA (AN/BRR-6/6B): Development of Criticality Analysis, Supply Chain Risk Management, Program Protection Plan, and Security Classification Guide for cybersecurity vulnerability detection and hardening.
FY19 Antenna Improvements: Technical Data Package (TDP) for the Automatic Identification System (AIS) Amplifiers in support of P3I for legacy antennas.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

FY19 Transition Engineering: Continue concept engineering, new technology evaluations, and assessments in support of current and future Undersea Warfare.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Future Capabilites (Trans Eng)	WR	SSC Pacific : San Diego, CA	4.224	1.978	Nov 2016	0.800	Nov 2017	0.865	Nov 2018	-		0.865	Continuing	Continuing	Continuing
Systems Engineering (Trans Eng)	WR	MITRE : McLean, VA	1.950	0.571	Nov 2016	0.545	Nov 2017	0.567	Nov 2018	-		0.567	Continuing	Continuing	Continuing
Systems Engineering (Trans Eng)	WR	NUWC : Newport, RI	39.513	1.270	Nov 2016	0.582	Nov 2017	0.528	Nov 2018	-		0.528	Continuing	Continuing	Continuing
Security Engineering (Trans Eng)	C/CPFF	G2 OPS : San Diego, CA	0.300	0.250	Nov 2016	0.258	Nov 2017	0.267	Nov 2018	-		0.267	0.000	1.075	-
Research and Analysis Reliability Dev (SubHDR)	WR	NUWC : Newport, RI	6.041	1.300	Nov 2016	0.834	Nov 2017	0.253	Nov 2018	-		0.253	Continuing	Continuing	Continuing
Research and Analysis Reliability Dev (SubHDR)	C/CPIF	Raytheon : Marlboro, MA	0.000	4.162	Jun 2017	0.867	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering (SubHDR)	WR	NUWC : Newport, RI	19.120	0.481	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
OCOMMS PA Demonstration Systems Development (AdvHDR)	C/CPAF	Aerospace : San Diego, CA	0.159	0.376	Feb 2017	0.144	Feb 2018	0.120	Feb 2019	-		0.120	Continuing	Continuing	Continuing
OCOMMS PA Demonstration System Development (AdvHDR)	C/CPFF	TBD : TBD	0.000	0.000		1.509	May 2018	1.615	May 2019	-		1.615	Continuing	Continuing	Continuing
Systems Engineering (AdvHDR)	WR	SSC Pacific : San Diego, CA	10.410	1.088	Nov 2016	1.000	Nov 2017	1.146	Nov 2018	-		1.146	Continuing	Continuing	Continuing
Systems Engineering (AdvHDR)	WR	NUWC : Newport, RI	0.000	0.773	Nov 2016	0.356	Nov 2017	0.192	Nov 2018	-		0.192	0.000	1.321	-
Security Engineering/ Cybersecurity (BRR-6)	C/CPFF	G2 OPS : San Diego, CA	0.000	0.264	Nov 2016	0.252	Nov 2017	0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (BRR-6)	WR	NSWC : Philadelphia, PA	4.546	1.878	Nov 2016	0.855	Nov 2017	2.236	Nov 2018	-		2.236	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (BRR-6)	WR	NUWC : Newport, RI	2.360	1.437	Nov 2016	0.687	Nov 2017	1.663	Nov 2018	-		1.663	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (BRR-6)	WR	NSWC : Carderock	0.371	0.567	Nov 2016	0.288	Nov 2017	0.780	Nov 2018	-		0.780	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Hardware Dev (Antenna Improvements)	WR	NSWC : Philadelphia, PA	0.000	2.270	Nov 2016	3.143	Nov 2017	2.383	Nov 2018	-		2.383	Continuing	Continuing	Continuing
Systems Engineering/ Hardware Dev (Antenna Improvements)	WR	NSWC : Carderock	0.000	0.125	Nov 2016	0.130	Nov 2017	0.135	Nov 2018	-		0.135	Continuing	Continuing	Continuing
Product Development Prior Years	Various	Various : Various	168.310	0.000		0.000		0.000		-		0.000	0.000	168.310	110.707
Research and Analysis Reliability Dev (SubHDR)	C/CPAF	BTP Systems : Ludlow, MA	3.049	2.100	Nov 2016	0.167	Feb 2018	0.000		-		0.000	0.000	5.316	-
		Subtotal	260.353	20.890		12.417		13.000		-		13.000	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support (SubHDR)	C/CPFF	CSA : San Diego, CA	0.275	0.157	Feb 2017	0.090	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Cost Estimating (AdvHDR)	C/CPFF	TASC : San Diego, CA	0.075	0.075	Feb 2017	0.075	Feb 2018	0.075	Feb 2019	-		0.075	Continuing	Continuing	Continuing
Integrated Logistics Support (AdvHDR)	C/CPFF	CSA : San Diego, CA	0.075	0.075	Feb 2017	0.075	Feb 2018	0.080	Feb 2019	-		0.080	Continuing	Continuing	Continuing
Integrated logistics Support (BRR-6)	WR	NUWC : Newport, RI	0.097	0.114	Nov 2016	0.116	Nov 2017	0.118	Nov 2018	-		0.118	Continuing	Continuing	Continuing
Configuration Management (BRR-6)	WR	NSWC : Philadelphia, PA	0.000	0.644	Nov 2016	0.303	Nov 2017	0.298	Nov 2018	-		0.298	0.000	1.245	-
Integrated Logistics Support (Antenna Improvements)	C/CPFF	CSA : San Diego, CA	0.000	0.050	Feb 2017	0.050	Feb 2018	0.050	Feb 2019	-		0.050	Continuing	Continuing	Continuing
Support Prior Years	Various	Various : Various	8.609	0.000		0.000		0.000		-		0.000	0.000	8.609	6.630
		Subtotal	9.131	1.115		0.709		0.621		-		0.621	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental/ Operational T&E (OE-538)	WR	NUWC : Newport, RI	7.656	0.583	Nov 2016	0.050	Nov 2017	0.050	Nov 2018	-		0.050	Continuing	Continuing	Continuing
Test & Evaluation (OE-538)	WR	COTF : Norfolk, VA	1.309	0.065	Nov 2016	0.150	Nov 2017	0.050	Nov 2018	-		0.050	Continuing	Continuing	Continuing
Test & Evaluation (SubHDR)	WR	NUWC : Newport, RI	2.045	1.013	Feb 2017	0.164	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Integration, Assembly & Test (BRR-6)	WR	NSWC : Philadelphia, PA	0.000	0.130	Nov 2016	0.283	Nov 2017	0.285	Nov 2018	-		0.285	0.000	0.698	-
Integration, Assembly & Test (BRR-6)	WR	NSWC : Carderock	0.000	0.099	Nov 2016	0.481	Nov 2017	0.345	Nov 2018	-		0.345	0.000	0.925	-
Integration, Assembly & Test (BRR-6)	WR	NUWC : Newport, RI	0.000	0.219	Nov 2016	0.241	Nov 2017	0.244	Nov 2018	-		0.244	0.000	0.704	-
Test and Evaluation Prior Years	Various	Various : Various	5.247	0.000		0.000		0.000		-		0.000	0.000	5.247	4.207
		Subtotal	16.257	2.109		1.369		0.974		-		0.974	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support (Trans Eng)	C/CPFF	CSA : San Diego, CA	4.177	0.384	Feb 2017	0.392	Feb 2018	0.400	Feb 2019	-		0.400	Continuing	Continuing	Continuing
Program Management Support (SubHDR)	C/CPFF	CSA : San Diego, CA	3.822	0.440	Feb 2017	0.166	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support (AdvHDR)	C/CPFF	CSA : San Diego, CA	7.791	0.240	Feb 2017	0.249	Feb 2018	0.255	Feb 2019	-		0.255	Continuing	Continuing	Continuing
Program Management Support (BRR-6)	C/CPFF	CSA : San Diego, CA	0.172	0.120	Feb 2017	0.175	Feb 2018	0.101	Feb 2019	-		0.101	Continuing	Continuing	Continuing
Program Management Support (Antenna Improvements)	C/CPFF	CSA : San Diego, CA	0.000	0.075	Feb 2017	0.175	Feb 2018	0.075	Feb 2019	-		0.075	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

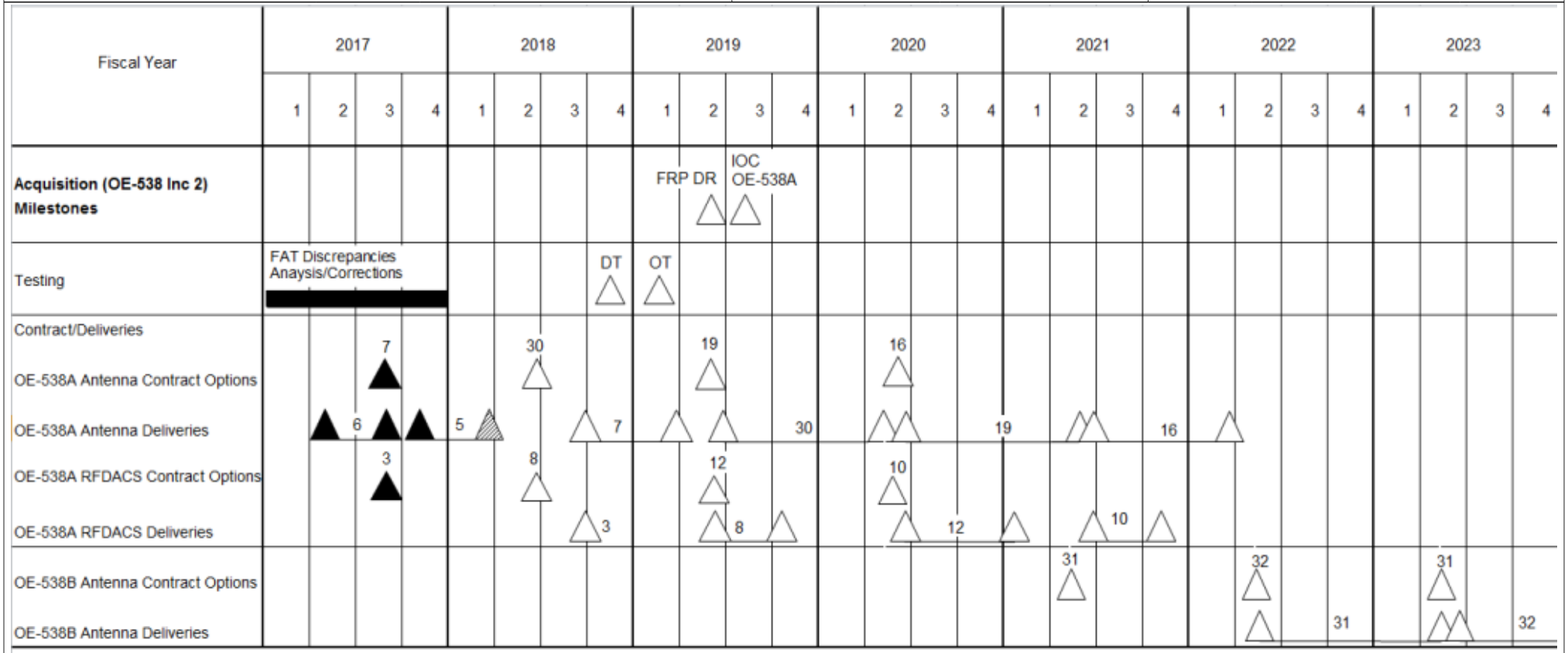
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services Prior Years	Various	Various : Various	4.608	0.000		0.000		0.000		-		0.000	0.000	4.608	Continuing
		Subtotal	20.570	1.259		1.157		0.831		-		0.831	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	306.311	25.373		15.652		15.426		-		15.426	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

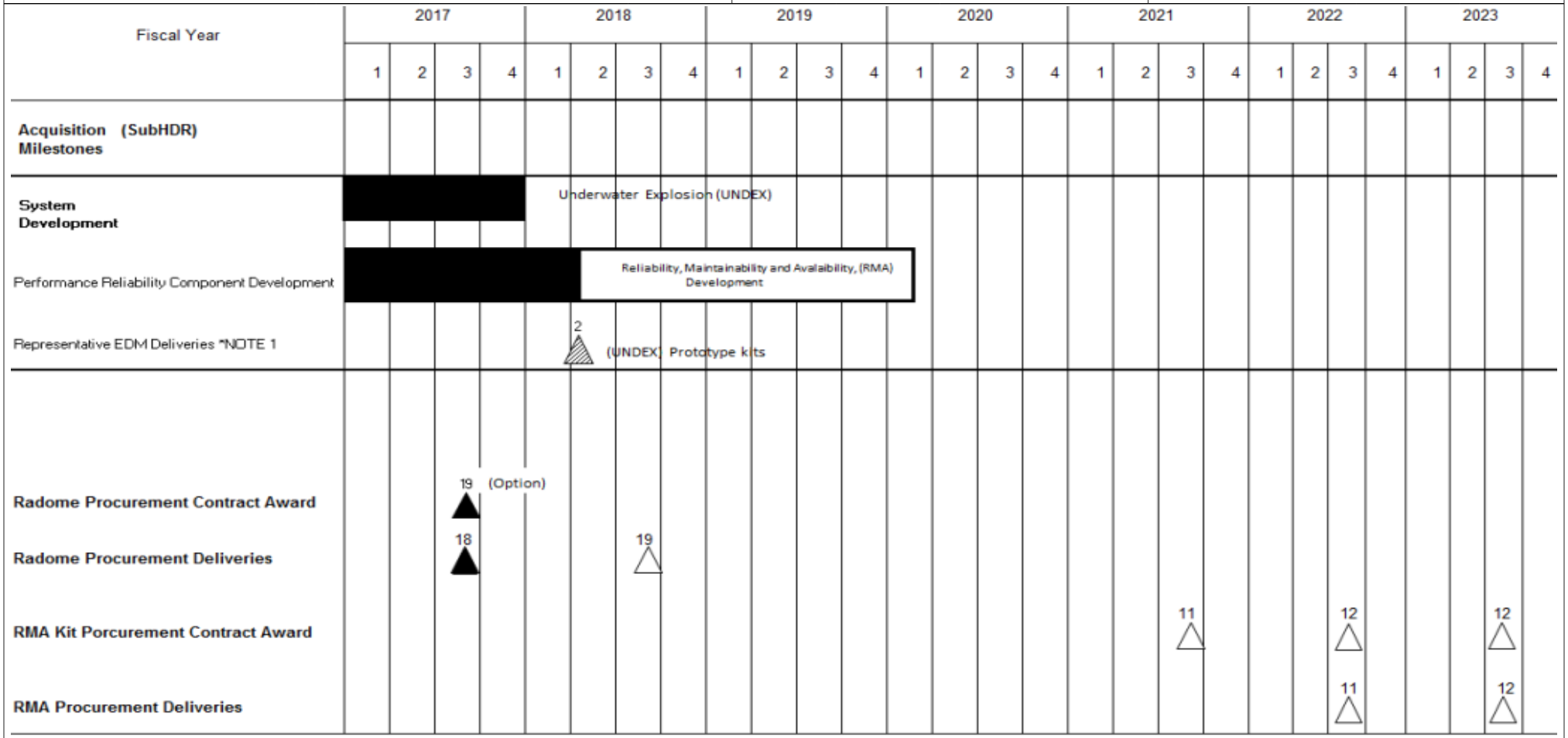


1) OE-538B development efforts funded under PMW170 RDTE Program Element: 0604777N Project Unit: 0921.

ACRONYMS:

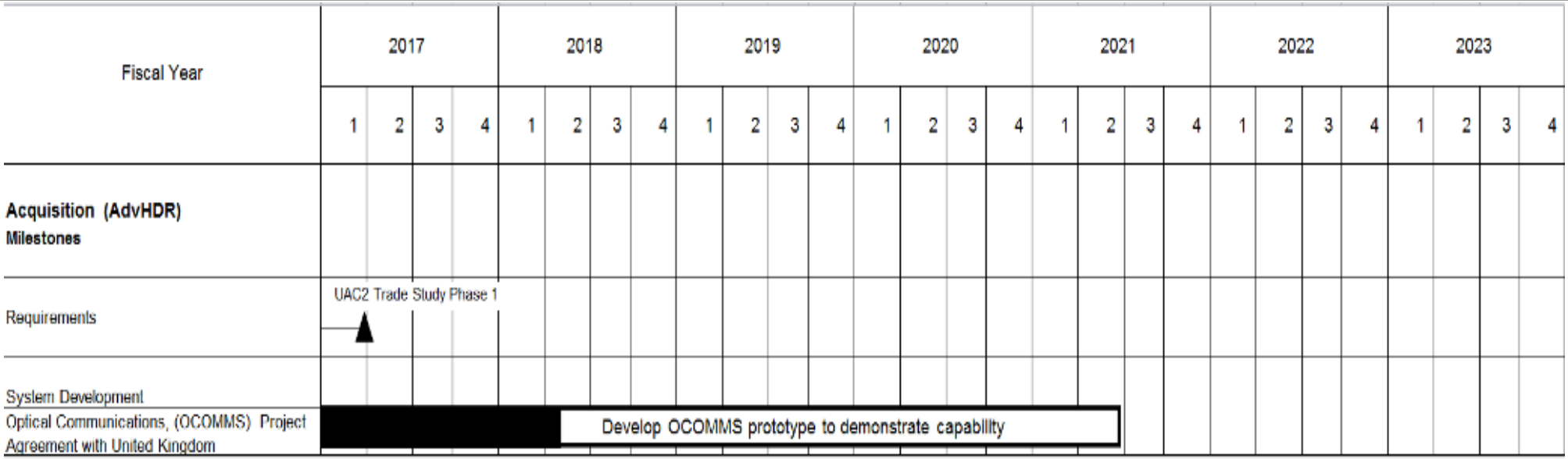
DT - Developmental Test	IOC - Initial Operational Capability
DR - Decision Review	OT - Operational Test
FAT - First Article Test	RFDACS - Radio Frequency Distribution and control System

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*



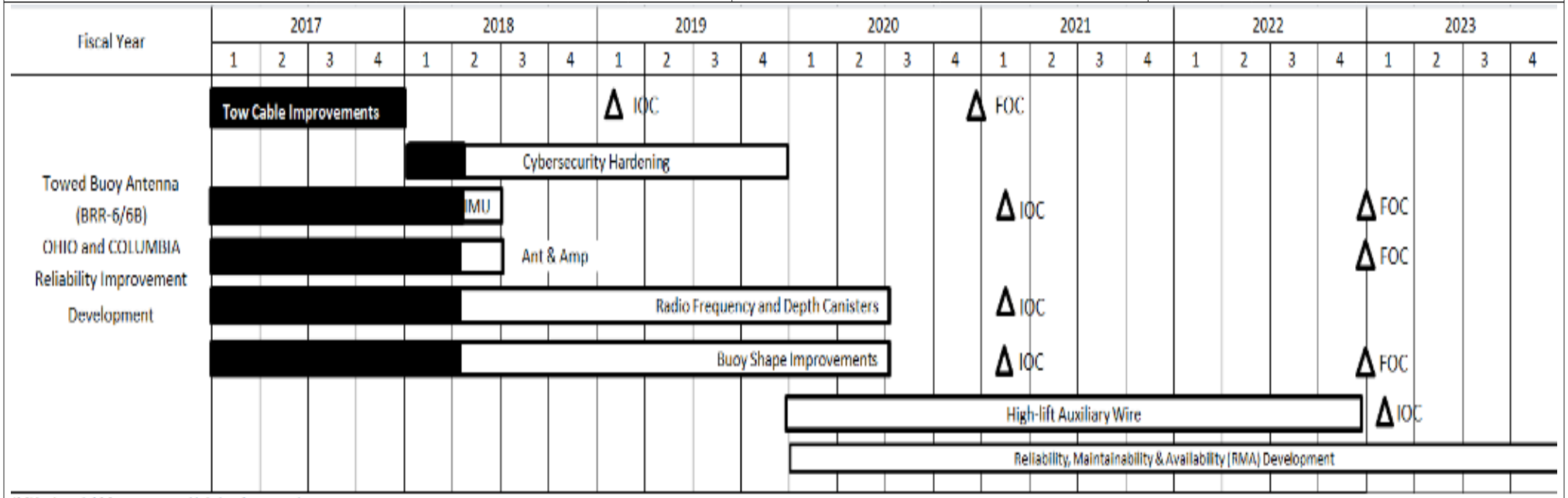
NOTE 1: UNDEX Development has completed. Prototype kit delivery delayed until 2nd quarter due to one long lead item.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*



Acronyms:
UAC2 Undersea Assured Command & Control
Note: OCOMMS PA is an international Agreement with the U.K.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*



IMU = Inertial Measurement Unit Implementation

Ant & Amp = Antenna and Amplifier Improvements

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*	

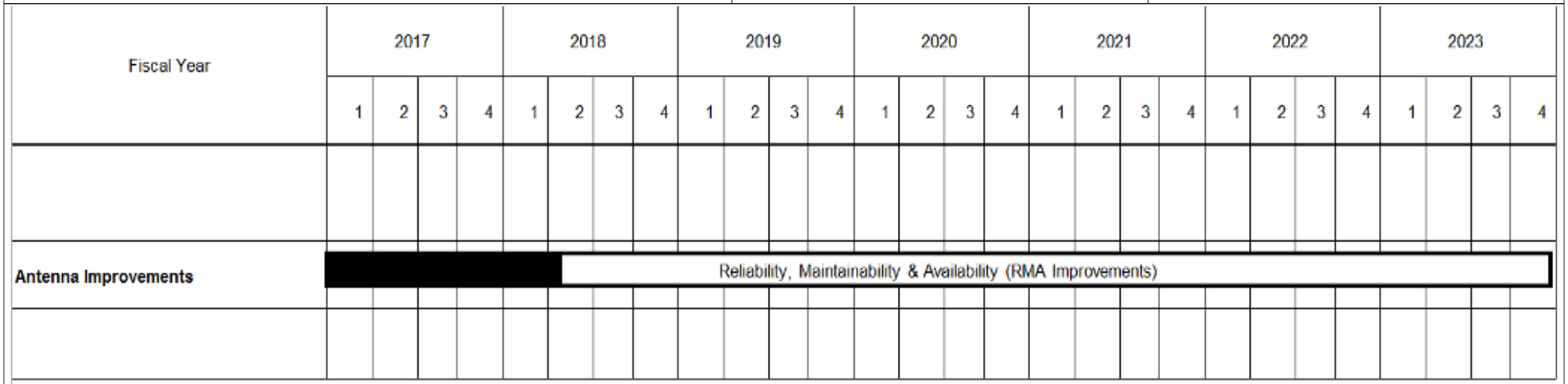
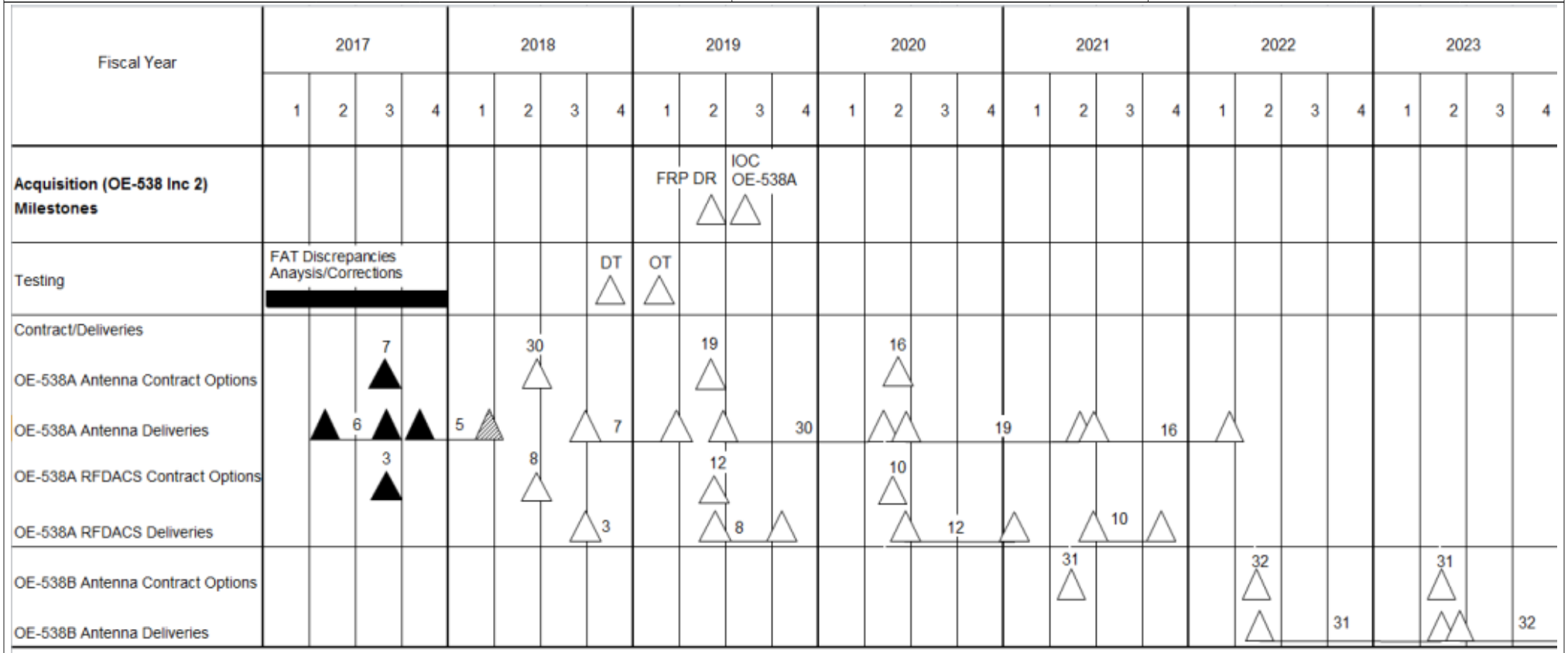


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*



1) OE-538B development efforts funded under PMW170 RDTE Program Element: 0604777N Project Unit: 0921.

ACRONYMS:

DT - Developmental Test	IOC - Initial Operational Capability
DR - Decision Review	OT - Operational Test
FAT - First Article Test	RFDACS - Radio Frequency Distribution and control System

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0742				
OE-538A Full Rate Production Decision Review (FRP DR)	2	2019	2	2019
OE-538A Initial Operational Capability (IOC)	3	2019	3	2019
OE-538A First Article Test (FAT) Discrepancies Analysis/Corrections	1	2017	4	2017
OE-538A DT for Full Rate Production (FRP)	4	2018	4	2018
OE-538A Operational Test (OT)	1	2019	1	2019
OE-538A Antenna Deliveries Year 1	2	2017	3	2017
OE-538A Antenna Deliveries Year 2	4	2017	2	2018
OE-538A Antenna Contract Option Year 3	3	2017	3	2017
OE-538A Antenna Deliveries Year 3	3	2018	2	2019
OE-538A Antenna Contract Option Year 4	2	2018	2	2018
OE-538A Antenna Deliveries Year 4	2	2019	2	2020
OE-538A Antenna Contract Option Year 5	2	2019	2	2019
OE-538A Antenna Deliveries Year 5	2	2020	2	2021
OE-538A Antenna Contract Option Year 6	2	2020	2	2020
OE-538A Antenna Deliveries Year 6	2	2021	2	2022
OE-538A RFDACS Contract Options Year 1	3	2017	3	2017
OE-538A RFDACS Deliveries Year 1	3	2018	4	2018
OE-538A RFDACS Contract Option Year 2	2	2018	2	2018
OE-538A RFDACS Deliveries Year 2	2	2019	4	2019
OE-538A RFDACS Contract Option Year 3	2	2019	2	2019
OE-538A RFDACS Deliveries Year 3	2	2020	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
OE-538A RFDACS Contract Option Year 4	2	2020	2	2020
OE-538A RFDACS Deliveries Year 4	2	2021	4	2021
OE-538B Antenna Contract Option Year 1	2	2021	2	2021
OE-538B Antenna Deliveries Year 1	2	2022	2	2023
OE-538B Antenna Contract Option Year 2	2	2022	2	2022
OE-538B Antenna Deliveries Year 2	2	2023	4	2023
OE-538B Antenna Contract Option Year 3	2	2023	2	2023
Submarine High Data Rate (SubHDR) Under Water Explosion (UNDEX) Development	1	2017	4	2017
SubHDR Performance Reliability Component Development/Test	1	2017	3	2020
SubHDR Production Representative UNDEX Engineering Development Model (EDM) Deliveries	4	2017	1	2018
SubHDR Radome Procurement Contract/Option Awards	3	2017	3	2017
SubHDR Radome Production Deliveries	3	2017	3	2018
SubHDR RMA Kit Procurement Contract Award	3	2021	3	2023
SubHDR RMA Kit Deliveries	3	2022	3	2023
AdvHDR Trade Study for Undersea Assured Command & Control	1	2017	1	2017
AdvHDR Optical Communications Project Agreement with United Kingdom	1	2017	2	2021
Towed Buoy Antenna (AN/BRR-6/6B) reliability improvement development: Tow Cable Strength and Throughput Improvements	1	2017	4	2017
TBA (AN/BRR-6/6B) reliability improvement development development: Buoy Shape Improvements	1	2017	2	2020
TBA (AN/BRR-6/6B) reliability improvement development: Radio Frequency and Depth Canisters	1	2017	2	2020
TBA (AN/BRR-6/6B) reliability improvement development: Antenna and Amplifier Improvements	1	2017	2	2018
TBA (AN/BRR-6/6B) reliability improvement development: Inertial Measurement Unit (IMU) Implementation	1	2017	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0742 / *Sub Integrated Ant System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TBA (AN/BRR-6/6B) reliability improvement development: High-lift Auxiliary Wire	1	2019	4	2021
TBA (AN/BRR-6/6B) Cybersecurity Hardening	1	2018	4	2019
TBA (AN/BRR-6/6B) Reliability, Maintainability & Availability (RMA) Development	1	2020	4	2022
Antenna Improvements Reliability, Maintainability & Availability (RMA) Development	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 0775 / *Submarine Supt Equip Prog*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0775: *Submarine Supt Equip Prog*	14.615	13.118	9.117	28.408	-	28.408	15.206	14.906	13.985	14.272	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY 19 budget continues to update the Multifunction Modular Mast (MMM) payload to meet emergent Fleet needs, expand spectrum digitization and develop technologies for inclusion in future Technical Insertions (TIs) and Advanced Processor Builds (APBs). The Submarine Support Equipment Program (SSEP) seeks to develop or transition from the Advanced Submarine Support Equipment Program (ASSEP) and Future Naval Capability (FNC) efforts to all TIs capabilities for Electronic Attack (EA), tactical communications, EW sensor for future Task-Oriented Technology Insertion Mast (TOTIM) planned for TI-20 platforms, improved digitizers, and EW data processing. It also calls for the development of advanced technology demonstrations for feasibility of systems capable of meeting later TIs and APBs of AN/BLQ-10 for performance and digital data delivery. Submarine Launched Decoy is a tactical speed-to-fleet initiative that meets Fleet need for submarine littoral operations. Tactical Data Link communications is a program designed to increase submarine capability for joint operations.

The SSEP is responsible for the development and improvement of submarine Electronic Warfare (EW) systems in support of effective operations in the following mission areas: Joint Littoral Warfare; Joint Intelligence Surveillance Reconnaissance (ISR), Indications and Warnings; Electronic Warfare; Information Operations including Cyber; and Special Operations Force (SOF) support. The rapid proliferation of complex radar, communications and navigation equipment available to potential adversaries creates an increasingly dense and sophisticated electromagnetic environment. Sustained and significant improvements to submarine EW systems are required to maintain tactical ship safety and operational effectiveness. As such, EW was raised to a submarine primary mission area in FY2012 by Commander Submarine Forces, and EW is listed as the number one modernization requirement by the Submarine Tactical Requirements Group (STRG). The OPNAV letter dated 17 June 12, SER N97/12U144401 further codified this need by directing development of a digital Next Generation EW system as an evolution of the AN/BLQ-10 EW program.

The RDTE funding line supports the entire AN/BLQ-10 EW procurement program. Specific development focus areas include simultaneous transmit and receive apertures, improved antenna sensors, high bandwidth digitizers, high speed networking, large capacity data storage and retrieval, scalable integrated RF and advanced algorithms for improved system performance and new capability.

The FY19 increase supports MMM Payload development and TI-20 hardware and software development. This work is required to upgrade submarine EW systems from analogue, stove-piped passive systems to digital, integrated systems capable of increasing the submarines offensive power as required by Submarine Tactical Requirements Group guidance as well as the DoD EW Strategy.

- The MMM Payload will be developed in three successive generations adding capability as threats and requirements emerge. The first generation provides Unmanned Aerial Systems (UAS) capability. The second generation is planned to add Coherent Electronic Attack (CEAS) and Tactical Data Link (TDL) Communications to the UAS mission. The third generation will improve the ranges and reliability of these mission sets.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0775 / *Submarine Supt Equip Prog*

- TI-20 funding is critical to developing enabling technologies that will provide maximized electronic spectrum digitization and processing, allowing Submarine EW system to continue to pace the threat. The EW environment is increasingly complex and crowded. The paradigms, algorithms, and analogue systems the Navy has relied on for decades are no longer able to maintain tactical relevance in the digital era of low power radars with digital waveforms. Tactical decision makers are unable to maintain awareness of the EW spectrum with current systems. Without significant investment in TI-20, the Submarine Navy will not be able to maintain littoral presence, conduct Anti-Access Area Denial operations, coordinated strike operations, joint ISR, and SOF support.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Submarine Support Equipment Program	13.118	9.117	28.408	0.000	28.408
Articles:	-	-	-	-	-
FY 2018 Plans: -- Conduct TI-16 developmental testing on the Server-Based Radar Narrow Band (SB-RNB) and EW portions of the Low-Profile Photonics Mast. -- Update AN/BLQ-10 software baseline changes for SWFTS and NPES, SPR Resolution and Software Enhancement. Initiate design and development of TI-18 processor upgrades and Tactical Decision Aid. -- Continue development of TI-20 capabilities for MMM payload EW System, EW Server, DF improvements, and Communications Digital Aperture Correlation and Emitter improvements. -- Develop advanced technology demonstrations for feasibility of systems capable of meeting later increments of AN/BLQ-10 for performance and digital data delivery. -- Develop TI-20 configuration and architecture documentation and initial efforts for the development of the TI-20 software design. -- Conduct a Tactical Advancements for the Next Generation (TANG) event to improve the Human Machine Interface (HMI) of the EW system. -- Conduct testing for MMM Payload, Submarine Launched Decoy (SLD) buoy, high speed network, improvements to emitter algorithms, improvements to correlation algorithms and improvements to vulnerability assessment algorithms. Tests include side by side laboratory testing, at sea testing (inclusive of TEMPALT development and crew training), fleet experimentation coordination and support, and technology demonstrations. -- Develop TDL communications capabilities and module specifications.					
FY 2019 Base Plans: -- The $19M increase in funding is to initiate TI-20 development, design, integration of previously developed TI-20 technologies and other Non-Recurring Engineering efforts with industry and procure initial development hardware including racks, cabling, RF simulators, downconverters, signal distribution modules, controls and display units, and initial integration hardware. This funding will support further digitization of the AN/BLQ-10 system with a completely new design removing stove-piped analogue subsystems and replacing them with					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0775 / *Submarine Supt Equip Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
digital components that allows for "spectrum as a service" usage. TI-20 funding is critical to developing enabling technologies that will provide maximized electronic spectrum digitization and processing, allowing Submarine EW system to continue to pace the threat. The EW environment is increasingly complex and crowded. The paradigms, algorithms, and analogue systems the Navy has relied on for decades are no longer able to maintain tactical relevance in the digital era of low power radars with digital waveforms. Tactical decision makers are unable to maintain awareness of the EW spectrum with current systems. Without significant investment in TI-20, the Submarine Navy will not be able to maintain littoral presence, conduct Anti-Access Area Denial operations, coordinated strike operations, joint ISR, and SOF support. -- Commence integration of EW Payloads into the AN/BLQ-10 system to interface with the TI-20 system. -- Commence development of a digital Early Warning Receiver as part of the TI-20 system. -- Complete TI-16 developmental testing on the Server-Based Radar Narrow Band (SB-RNB) and EW portions of the Low-Profile Photonics Mast. -- Update AN/BLQ-10 software baseline changes for SWFTS and NPES, SPR Resolution and Software Enhancement via the Advanced Processor Build (APB) process to fully utilize the new technology being fielded in TI-20 with broader spectrum digitization. -- Continue development of TI-20 capabilities for MMM payload EW System, EW Server, DF improvements, and Communications Digital Aperture Correlation and Emitter improvements. -- Develop advanced technology demonstrations for feasibility of systems capable of meeting later increments of AN/BLQ-10 for performance and digital data delivery. -- Continue TI-20 configuration, architecture documentation and software design. -- Conduct testing for MMM Payload, SLD buoy, improvements to emitter algorithms and improvements to correlation algorithms, improvements to vulnerability assessment algorithms. Tests include side by side laboratory testing, at sea testing (inclusive of TEMPALT development and crew training), fleet experimentation coordination and support, and technology demonstrations. -- Update the MMM Payload to meet emerging Fleet needs and integrate into the AN/BLQ-10 system and combine Gen 1 MMM Payload capabilities with TDL communications capabilities.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The $19M increase in funding from FY18 to FY19 is primarily to initiate MMM Payload development, TI-20 hardware and software development, design, integration of previously developed TI-20 technologies and other Non-Recurring Engineering efforts with industry and procure initial development hardware including racks,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0775 / *Submarine Supt Equip Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
cabling, RF simulators, downconverters, signal distribution modules, controls and display units, and initial integration hardware. This funding will support further digitization of the AN/BLQ-10 system with a completely new design removing stovepiped analogue subsystems and replacing them with digital components that allows for "spectrum as a service" usage.					
Accomplishments/Planned Programs Subtotals	13.118	9.117	28.408	0.000	28.408

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/2013: *VIRGINIA Class Submarine*	5,040.219	5,225.911	7,169.783	-	7,169.783	7,150.388	6,475.968	6,004.291	6,126.497	40,799.161	150,316.746
• RDT&E/0604558N: *New Design SSN*	127.883	120.087	148.233	-	148.233	118.539	194.800	232.977	277.239	Continuing	Continuing
• RDT&E/0603562N: *Submarine Tactical Warfare Sys*	8.603	13.834	9.374	-	9.374	11.314	11.551	13.365	12.031	Continuing	Continuing
• OPN/0840: *Sub Periscope, Imaging and Supt Equip Prog*	151.963	151.240	178.421	-	178.421	199.590	224.643	215.012	255.918	Continuing	Continuing
• RDT&E/0603595N: *SSBN New Design*	681.164	776.158	514.846	-	514.846	433.296	313.445	196.082	173.611	Continuing	Continuing

Remarks

D. Acquisition Strategy

AN/BLQ-10 (V) EW System - Procurements are executed/managed in accordance with Acquisition Plan (Rev 10) for AN/BLQ-10(V) EW System dtd 02/01/17 and the Single Acquisition Management Plan dtd 06/12/14.

E. Performance Metrics

The Research, Development and Demonstration (RDD) program goal is to respond to urgent operational needs within 30 days and provide for rapid development and fielding of prototype solutions within 270 days.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0775 / *Submarine Supt Equip Prog*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware and Software Development	Various	Various : Various	0.000	2.500	Oct 2016	1.323	Oct 2017	1.349	Oct 2018	-		1.349	Continuing	Continuing	Continuing
Hardware and Software Development	WR	NUWC : Newport, RI	10.361	6.269	Oct 2016	1.423	Oct 2017	1.451	Oct 2018	-		1.451	Continuing	Continuing	Continuing
Hardware and S/W Development MMM Payload	C/FFP	Competitive : TBD	0.000	0.000		3.000	Oct 2017	3.570	Oct 2018	-		3.570	Continuing	Continuing	Continuing
Hardware and S/W Development:	C/CPIF	Competitive: : TBD	0.000	0.000		0.000		18.561	Oct 2018	-		18.561	Continuing	Continuing	Continuing
		Subtotal	10.361	8.769		5.746		24.931		-		24.931	Continuing	Continuing	N/A

Remarks

The growth from FY18 to FY19 is due to the RDTE funding line receiving a zero-sum transfer from OPN, starting in FY19, to provide for MMM Payload development and TI-20 hardware and software development. The MMM Payload will be developed in three successive generations adding capability as threats and requirements emerge. The first generation provides Unmanned Aerial Systems (UAS) capability. The second generation is planned to add Coherent Electronic Attack (CEAS) and TDL Communications to the UAS mission. The third generation will improve the ranges and reliability of these mission sets. The funding transfer from OPN to the RDTE funding line will be allocated between NUWC Newport and a new contract to be awarded in FY18.

PMS435 is expecting to award the TI-20 development contract near the beginning of FY19.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	WR	COTF : Norfolk, VA	0.514	0.275	Oct 2016	0.310	Oct 2017	0.320	Oct 2018	-		0.320	Continuing	Continuing	Continuing
Systems Engineering & Test Support	WR	NUWC : Newport, RI	3.740	4.074	Oct 2016	3.061	Oct 2017	3.157	Oct 2018	-		3.157	Continuing	Continuing	Continuing
		Subtotal	4.254	4.349		3.371		3.477		-		3.477	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	14.615	13.118		9.117		28.408		-		28.408	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 0775 / *Submarine Supt Equip Prog*	

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0775 / *Submarine Supt Equip Prog*

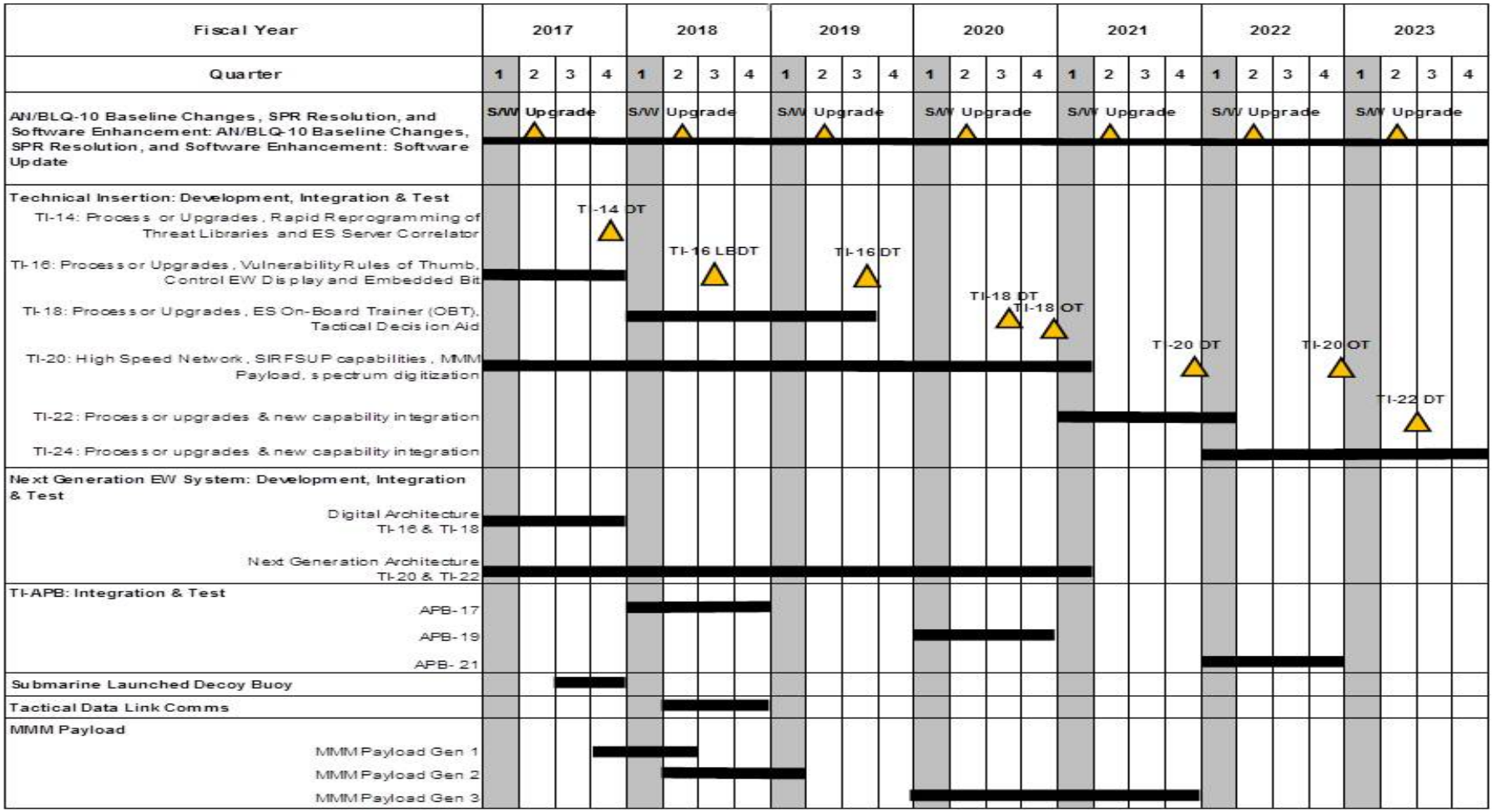


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0775 / *Submarine Supt Equip Prog*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0775				
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update: FY17-18	2	2017	2	2017
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update: FY18-19	2	2018	2	2018
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update: FY19-20	2	2019	2	2019
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update: FY20-21	2	2020	2	2020
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update: FY21-22	2	2021	2	2021
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update: FY22-23	2	2022	2	2022
AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: AN/BLQ-10 Baseline Changes, SPR Resolution, and Software Enhancement: Software Update: FY23-24	2	2023	2	2023
Technical Insertion: Development, Integration & Test: TI-14: Processor Upgrades, Rapid Reprogramming of Threat Libraries and ES Server Correlator: Developmental Testing	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0775 / *Submarine Supt Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Technical Insertion: Development, Integration & Test: TI-16: Processor Upgrades, Vulnerability Rules of Thumb, Control EW Display and Embedded Bit:	1	2017	4	2017
Technical Insertion: Development, Integration & Test: TI-16: Processor Upgrades, Vulnerability Rules of Thumb, Control EW Display and Embedded Bit: SB-RNB LBDT	3	2018	3	2018
Technical Insertion: Development, Integration & Test: TI-16: Processor Upgrades, Vulnerability Rules of Thumb, Control EW Display and Embedded Bit: SB-RNB DT	3	2019	3	2019
Technical Insertion: Development, Integration & Test: TI-18: Processor Upgrades, ES On-board Trainer (OBT) Tactical Decision Aid:	1	2018	3	2019
Technical Insertion: Development, Integration & Test: TI-18: Processor Upgrades, ES On-board Trainer (OBT) Tactical Decision Aid: Developmental Testing	3	2020	3	2020
Technical Insertion: Development, Integration & Test: TI-18: Processor Upgrades, ES On-board Trainer (OBT) Tactical Decision Aid: Operational Testing	4	2020	4	2020
Technical Insertion: Development, Integration & Test: TI-20: High Speed Network, SIRFSUP capabilities, MMM Payload, Spectrum Digitization:	1	2017	1	2021
Technical Insertion: Development, Integration & Test: TI-20: High Speed Network, SIRFSUP capabilities, MMM Payload, Spectrum Digitization: Developmental Testing	4	2021	4	2021
Technical Insertion: Development, Integration & Test: TI-20: High Speed Network, SIRFSUP capabilities, MMM Payload, Spectrum Digitization: Operational Testing	4	2022	4	2022
Technical Insertion: Development, Integration & Test: TI-22: Processor Upgrades and New Capability Integration:	1	2021	1	2022
Technical Insertion: Development, Integration & Test: TI-24: Processor Upgrades and New Capability Integration:	1	2022	4	2023
Next Generation EW System: Development, Integration & Test (DI&T): Digital Architecture: TI-16 & TI-18	1	2017	4	2017
Next Generation EW System: Development, Integration & Test (DI&T): Next Generation Architecture: TI-20 & TI-22	1	2017	1	2021
TI-APB: Integration & Test: APB-17:	1	2018	4	2018
TI-APB: Integration & Test: APB-19:	1	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 0775 / *Submarine Supt Equip Prog*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TI-APB: Integration & Test: APB-21:	1	2022	4	2022
Submarine Launched Decoy Buoy: SLD Buoy:	3	2017	4	2017
Tactical Data Link Comms: Tactical Data Link Comms:	2	2018	4	2018
MMM Payload: MMM Payload Gen 1:	4	2017	2	2018
MMM Payload: MMM Payload Gen 2:	2	2018	1	2019
MMM Payload: MMM Payload Gen 3:	1	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 1411 / *Sub Tact Comm System*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1411: *Sub Tact Comm System*	218.531	9.806	19.494	16.068	-	16.068	19.538	13.075	14.449	19.986	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Submarine Tactical Communications System budget item (1411) funds the Common Submarine Radio Room (CSRR) program, which provides a fully integrated and tested communications architecture of Command, Control, Communications, Computers, and Intelligence (C4I) program of record components, providing secure voice and data communications for all submarine classes. The CSRR program, via an end-to-end integrated test environment, ensures that submarine communications systems: (a) enhance assured information transfer via automated and integrated network management; (b) support assured command and control, (c) provide submarine Internet Protocol (IP) connectivity; (d) are interoperable with Nuclear Command, Control, and Communications (NC3), United States and allied/coalition military networks; (e) meet NC3 strategic messaging requirements; and (f) provide improved reliability, maintainability, and availability. The CSRR program includes the development of a network-controlled computer based trainer to support training requirements. The CSRR program provides systems engineering efforts associated with implementation of new technology allowing submarines to connect to the global information grid. The new technology will also ensure the submarine's continued ability to participate in network-centric warfare and exploit its inherent stealth capabilities in support of the Navy, NC3, Joint, and allied/coalition fight to achieve total battlespace information dominance. The CSRR Program is authorized to field Increment 1 as multiple block upgrades (Versions). CSRR Increment 1 Version 4 is planned to address equipment obsolescence and End of Support issues. CSRR Increment 1 Version 5 modernizes critical NC3 components supporting the reception of Emergency Action Messages (EAMs) which are required for the Submarine Forces to execute Force Management and Force Execution of the fleet ballistic missile submarines (SSBNs). In addition, CSRR Inc1v5 modernizes obsolete/end-of-life/end-of-support C4I systems and infrastructure minimizing the risk of failure to NC3 and other tactical communication circuits.

Additional efforts funded under the Submarine Tactical Communications System budget item include (1) Undersea Platforms Special Communications, which provides fully integrated and tested Undersea Assured Command & Control (UAC2) communications systems enabling command and control (C2) in an environment where traditional communications are not available, thereby reducing platform susceptibility of detection and attack by the adversary and (2) Link 16, which provides an enhanced submarine communication system by providing a two-way Tactical Data Link (TDL) processing capability on all Submarine (Nuclear) (SSN), Guided Missile Submarine (Nuclear) (SSGN). The Link 16 program provides submarine Command & Control systems with Link 16 tactical network communications capabilities for situational awareness in a contested environment and is a key element in naval tactical networking. The new technology ensures the submarine's continued ability to participate in network-centric warfare and exploit its inherent stealth capabilities in support of the Navy, Nuclear Command, Control, and Communications (NC3), Joint, and allied/coalition fight to achieve total battlespace information dominance. These efforts are a continuation of the UAC2 and Link 16 efforts previously funded under the Submarine Integrated Antenna System Project (0742)/Advanced High Data Rate (HDR) and Antenna Transition Engineering program/project.

JUSTIFICATION FOR BUDGET ACTIVITY:
These programs are funded under ENGINEERING and MANUFACTURING DEVELOPMENT because they encompass development and demonstration of new end-items.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

CSRR: Funding in FY19 will allow for development of CSRR Increment 1 Version 1, 3, and 4 architecture model databases in support of implementing Model Based Systems
Engineering (MBSE) for LOS ANGELES, OHIO-SSBN, OHIO-SSGN, COLUMBIA, VIRGINIA, and SEAWOLF Class submarines; Environmental Qualification Testing (EQT) for CSRR Increment 1 Version 3 through Version 5; Test and evaluation efforts for CSRR Increment 1 Version 4 in support of a full fielding decision; Software development/upgrade for the Multi-purpose Reconfigurable Training System (MRTS) for CSRR Increment 1 Version 4 and 5; Implementation of Cybersecurity requirements and correction of Cybersecurity deficiencies for CSRR Increment 1 Version 4 and 5; Systems engineering development, modernization, and platform-specific Control and Management software development for Increment 1 Version 5; Development of a reconfigurable Platform Integration and Test Laboratory.

Undersea Assured Command & Control (UAC2): Funding in FY19 is to complete UAC2 Phase 2 Trade Study. Continue shore integration of UAC2 solution sets to support Department of Defense (DoD) Teleports and Department of Navy (DoN) Submarine Broadcast Control Authorities. Continue afloat integration of UAC2 solution sets on LOS ANGELES, OHIO-SSBN, OHIO-SSGN, VIRGINIA, and SEAWOLF Class submarines as well as Environmental Qualification Testing (EQT).

Link 16: Funding in FY19 is to continue systems engineering development of Link 16 tactical network communications capability. Continue Lab integration of the TDL processor with Multifunctional Information Distribution System (MIDS) Joint Tactical Radio System (JTRS) CMN-4 terminal into the submarine architecture. Commence EQT. Commence Submarine radio room to combat system design, development, and integration. Commence updates to applicable Acquisition Documentation to support Link 16.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Common Submarine Radio Room (CSRR)	9.806	10.994	10.616	0.000	10.616
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete update to the CSRR Acquisition Strategy to reflect changes for Increment 1 Version 4 through Version 6. - Complete CSRR Increment 1 Version 4 systems engineering development and modernization for the LOS ANGELES, SSBN, VIRGINIA, SSGN, and SEAWOLF Class submarines. - Complete development of platform specific builds of Increment 1 Version 4 Control and Management software for LOS ANGELES, SSBN, VIRGINIA, SSGN, and SEAWOLF Class capabilities. - Complete development of the Test and Evaluation Master Plan (TEMP) and all preparations for Increment 1 Version 4 Developmental Test (DT) and Operational Test (OT) events. - Complete contract planning and award Control and Management Software contract. - Continue Multi-purpose Reconfigurable Training System (MRTS) software upgrade for Increment 1 Version 4 CSRR baseline for LOS ANGELES, SSBN, and SSGN Class operator trainer and VIRGINIA Class maintenance trainer					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue implementation of Increment 1 Version 4 security upgrades to meet Cybersecurity and multiple certification requirements for General Service (GENSER) and Sensitive Compartmented Information (SCI) for all CSRR platforms. - Continue Federal Information Security Management Act (FISMA) statutory requirement for Cybersecurity compliance and correction of Increment 1 Version 1 through Version 4 Cybersecurity deficiencies. - Continue Supply Chain Risk Management (SCRM) assessment as part of Program Protection Plan (PPP) revision. - Commence CSRR Increment 1 Version 5 systems engineering development and modernization for the LOS ANGELES, OHIO-SSBN, OHIO-SSGN, COLUMBIA, VIRGINIA, and SEAWOLF Class submarines. - Commence development of platform specific builds of Increment 1 Version 5 Control and Management software for LOS ANGELES, OHIO-SSBN, OHIO-SSGN, COLUMBIA, VIRGINIA, and SEAWOLF Class capabilities. - Commence implementation of Increment 1 Version 5 security upgrades to meet Cybersecurity and multiple certification requirements for GENSER and SCI for all CSRR platforms. - Commence Federal Information Security Management Act (FISMA) statutory requirement for Cybersecurity compliance of Increment 1 Version 5 Cybersecurity deficiencies.					
FY 2019 Base Plans: CSRR Increment 1 Version 4 efforts: - Complete Multi-purpose Reconfigurable Training System (MRTS) software upgrade for LOS ANGELES, OHIO-SSBN, and OHIO-SSGN Class operator trainer and VIRGINIA Class maintenance trainer - Commence/Complete Test & Evaluation (T&E) on the LOS ANGELES, OHIO-SSBN, OHIO-SSGN, VIRGINIA, and SEAWOLF Class submarines. - Commence/Complete required SSBN Class Emergency Action Message (EAM) certification testing, data analysis and Targeting Change Message (TCM) testing. - Commence/Complete successful Full Fielding Decision - Complete implementation of security upgrades to meet Cybersecurity and multiple certification requirements for General Service (GENSER) and Sensitive Compartmented Information (SCI) for all CSRR platforms. CSRR Increment 1 Version 5 efforts: - Continue engineering development and modernization for the LOS ANGELES, OHIO-SSBN, OHIO-SSGN, COLUMBIA, VIRGINIA, and SEAWOLF Class submarines. - Continue development of platform specific builds of Control and Management software for LOS ANGELES, OHIO-SSBN, OHIO-SSGN, COLUMBIA, VIRGINIA, and SEAWOLF Class capabilities.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue implementation of security upgrades to meet Cybersecurity and multiple certification requirements for GENSER and SCI for all CSRR platforms. - Continue FISMA statutory requirement for Cybersecurity compliance of Cybersecurity deficiencies. - Commence MRTS software upgrade for LOS ANGELES, OHIO-SSBN, OHIO-SSGN, COLUMBIA, VIRGINIA, and SEAWOLF Class operator trainer and VIRGINIA Class maintenance trainer. Respective CSRR Increment 1 Versions: - Complete Federal Information Security Management Act (FISMA) statutory requirement for Cybersecurity compliance and correction of Increment 1 Version 1 through Version 4 Cybersecurity deficiencies. - Commence Environmental Qualification Testing (EQT) for CSRR Increment 1 Version 3 through Version 5. - Commence development of CSRR Increment 1 Version 1, 3, and 4 architecture model databases in support of implementing Model Based Systems Engineering (MBSE) for LOS ANGELES, OHIO-SSBN, OHIO-SSGN, COLUMBIA, VIRGINIA, and SEAWOLF Class submarines. - Continue Supply Chain Risk Management (SCRM) assessment as part of Program Protection Plan (PPP) revision. - Commence development of a reconfigurable Platform Integration and Test Laboratory. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Decrease from FY18 to FY19 is due to the completion of CSRR Increment 1 Version 4 (Inc1v4) systems engineering development and modernization. Efforts to support the development of platform specific builds of Inc1v4 Control and Management (C&M) software, award of C&M software contract, development of the Test and Evaluation Master Plan (TEMP), and update to the CSRR Acquisition Strategy that occurred in FY18 are no longer required in FY19. CSRR Inc1v4 will complete a successful full fielding decision in FY19.					
Title: Undersea Assured Command & Control (UAC2)	0.000	6.000	1.973	0.000	1.973
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue/Complete UAC2 technology development phase 1. - Commence UAC2 Phase 2 Trade Study Development. Previously funded under the Submarine Integrated Antenna System Project (0742)/Advanced High Data Rate (HDR) program/project. - Commence shore integration of UAC2 solution sets to support Department of Defense (DoD) Teleports.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Commence shore integration of UAC2 solution sets to support Department of Navy (DoN) Submarine Broadcast Control Authority. - Commence afloat integration of UAC2 solution sets on LOS ANGELES, OHIO-SSBN, OHIO-SSGN, VIRGINIA, and SEAWOLF Class submarines. - Commence Environmental Qualification Testing (EQT). ***FY 2019 Base Plans:*** - Complete UAC2 Phase 2 Trade Study Development. - Continue shore integration of UAC2 solution sets to support DoD Teleports. - Continue shore integration of UAC2 solution sets to support DoN Submarine Broadcast Control Authority. - Continue afloat integration of UAC2 solution sets on LOS ANGELES, OHIO-SSBN, OHIO-SSGN, VIRGINIA, and SEAWOLF Class submarines. - Continue Environmental Qualification Testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Decrease from FY18 to FY19 is due to the completion of UAC2 technology development for Solution 1. Environmental qualification testing (EQT), initial integration and testing within Common Submarine Radio Room (CSRR), Temporary Alteration (TEMPALT) documentation development, and Enterprise Change Request (ECR) development, all for five submarine classes, that occurred in FY18 are no longer required in FY19. Solution 1 is being procured in FY18 with an Initial Operational Capability Q4 FY18.					
Title: Link 16	0.000	2.500	3.479	0.000	3.479
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue/Complete Link 16 tactical network communications capability Analysis of Alternatives (AoA). - Commence systems engineering development of Link 16 tactical network communications capability. - Commence Lab integration of the Tactical Data Link (TDL) processor with Multifunctional Information Distribution System (MIDS) into the submarine architecture. ***FY 2019 Base Plans:*** - Continue systems engineering development of Link 16 tactical network communications capability. - Continue Lab integration of the TDL processor with MIDS into the submarine architecture.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Commence Environmental Qualification Testing (EQT). - Commence Submarine radio room to combat system design, development, and integration. - Commence updates to applicable Acquisition Documentation to support Link 16. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Increase from FY18 to FY19 is to support Link 16 Environmental Qualification Testing (EQT), initial integration and testing within Common Submarine Radio Room (CSRR), alteration documentation development, and Enterprise Change Request (ECR) development, all for four submarine classes.					
Accomplishments/Planned Programs Subtotals	9.806	19.494	16.068	0.000	16.068

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/3130: *Submarine Communication Equipment*	62.305	86.204	78.580	-	78.580	73.630	64.510	62.011	60.158	Continuing	Continuing
• OPN/0840: *Sub Periscope, Imaging and Supt Equip Prog*	151.963	151.240	178.421	-	178.421	199.590	224.643	215.012	255.918	Continuing	Continuing

Remarks

D. Acquisition Strategy

CSRR Program Milestones: Increment 1 Version 4 Critical Design Review (CDR) 1Q FY18, Developmental Test (DT) 1Q FY19, Operational Test (OT) 2Q FY19, Fielding Decision 3Q FY19. Increment 1 Version 5 PDR 4Q FY20, CDR 4Q FY21, DT 1Q FY22, OT 2Q FY22, and Fielding Decision 3Q FY22. Acquisition Decision Memorandum signed by Assistant Secretary of Navy for Research, Development & Acquisition dated 15 July 2008 approved consolidating Increments 1 and 2 to a single Increment 1 with multiple block upgrades (Versions). CSRR is currently post Milestone C and in Full Rate Production (FRP) and Deployment until FY 2030.

Link 16 Program Milestones: Developmental Test (DT) 1Q FY21, Operational Test (OT) 2Q FY21. Requirements documented in Commander Naval Surface Force (CNSF) letter dated 24 October 2005.

E. Performance Metrics

FY19 CSRR: Complete successful Full Fielding Decision for Increment 1 Version 4.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

FY19 UAC2: Complete UAC2 Phase 2 Trade Study.
FY19 Link 16: Continue systems engineering development of Link 16 tactical network communications capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Multi-Purpose Reconfigurable Training System (MRTS) Development (CSRR)	WR	SSC LANT : Charleston, SC	4.091	1.038	Dec 2016	1.332	Dec 2017	1.359	Dec 2018	-		1.359	Continuing	Continuing	Continuing
Systems Eng/Design Increment 1 (CSRR)	WR	NUWC : Newport, RI	13.791	4.142	Jan 2017	4.535	Jan 2018	4.626	Jan 2019	-		4.626	Continuing	Continuing	Continuing
Site Platform Integration/ Certification (CSRR)	WR	NUWC : Newport, RI	13.067	0.145	Jan 2017	0.156	Jan 2018	0.247	Jan 2019	-		0.247	Continuing	Continuing	Continuing
Software Development (CSRR)	C/CPFF	TBD : TBD	0.000	0.000		0.709	Mar 2018	1.912	Mar 2019	-		1.912	Continuing	Continuing	Continuing
Software Development (CSRR)	C/CPIF	Lockheed Martin : San Diego, CA	8.673	2.338	Mar 2017	1.832	Nov 2017	0.000		-		0.000	0.000	12.843	11.011
Systems Eng/Integration (UAC2)	WR	NUWC : Newport, RI	0.000	0.000		2.350	Nov 2017	0.850	Nov 2018	-		0.850	Continuing	Continuing	Continuing
Design (UAC2)	WR	SSC PAC : San Diego, CA	0.000	0.000		1.200	Mar 2018	0.350	Nov 2018	-		0.350	Continuing	Continuing	Continuing
Hardware Development (Link 16)	C/CPFF	TBD : TBD	0.000	0.000		0.500	Mar 2018	0.426	Nov 2018	-		0.426	Continuing	Continuing	Continuing
Systems Engineering (Link 16)	WR	NUWC : Newport, RI	0.000	0.000		0.750	Nov 2017	1.510	Nov 2018	-		1.510	Continuing	Continuing	Continuing
Site Platform integration/ Certification (Link 16)	WR	NUWC : Newport, RI	0.000	0.000		0.560	Nov 2017	0.571	Nov 2018	-		0.571	Continuing	Continuing	Continuing
Software Development (Link 16)	C/CPFF	TBD : TBD	0.000	0.000		0.420	Mar 2018	0.344	Nov 2018	-		0.344	Continuing	Continuing	Continuing
Product Development Prior Years	Various	Various : Various	124.155	0.000		0.000		0.000		-		0.000	0.000	124.155	124.155
		Subtotal	163.777	7.663		14.344		12.195		-		12.195	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 1411 / *Sub Tact Comm System*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support (CSRR)	WR	NUWC : Newport, RI	3.880	0.268	Nov 2016	0.290	Nov 2017	0.296	Nov 2018	-		0.296	Continuing	Continuing	Continuing
Software Engineering (CSRR)	WR	SSC PAC : San Diego, CA	3.836	0.207	Nov 2016	0.248	Nov 2017	0.253	Nov 2018	-		0.253	Continuing	Continuing	Continuing
Information Security/ Cyber Security (INFOSEC) Certification/Supply Chain Risk Management (SCRM) Assessment (CSRR)	Various	SSC PAC/SSC LANT/NUWC/ MITRE : San Diego, CA/Charleston, SC/ Newport, RI/San Diego	24.377	1.076	Nov 2016	1.212	Nov 2017	1.236	Nov 2018	-		1.236	Continuing	Continuing	Continuing
Integrated Logistics Support (UAC2)	WR	NUWC : Newport, RI	0.000	0.000		0.650	Nov 2017	0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
Trade Study (UAC2)	WR	MITRE : San Diego, CA	0.000	0.000		0.500	Nov 2017	0.300	Nov 2018	-		0.300	0.000	0.800	0.500
Integrated Logistics Support (Link 16)	WR	NUWC : Newport, RI	0.000	0.000		0.050	Nov 2017	0.200	Nov 2018	-		0.200	Continuing	Continuing	Continuing
Software Engineering (Link 16)	WR	SSC PAC : San Diego, CA	0.000	0.000		0.045	Nov 2017	0.245	Nov 2018	-		0.245	Continuing	Continuing	Continuing
		Subtotal	32.093	1.551		2.995		2.780		-		2.780	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental/ Operational Test and Evaluation (T&E) (CSRR)	WR	COTF, JITC : Various	11.285	0.000		0.060	Nov 2017	0.061	Nov 2018	-		0.061	Continuing	Continuing	Continuing
Test and Evaluation (T&E) (UAC2)	WR	COTF, JITC : Various	0.000	0.000		0.700	Nov 2017	0.023	Nov 2018	-		0.023	Continuing	Continuing	Continuing
Developmental/ Operational Test and Evaluation (T&E) (Link 16)	WR	COTF, JITC : Various	0.000	0.000		0.025	Nov 2017	0.030	Nov 2018	-		0.030	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 1411 / *Sub Tact Comm System*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			11.285	0.000		0.785		0.114		-		0.114	Continuing	Continuing	N/A

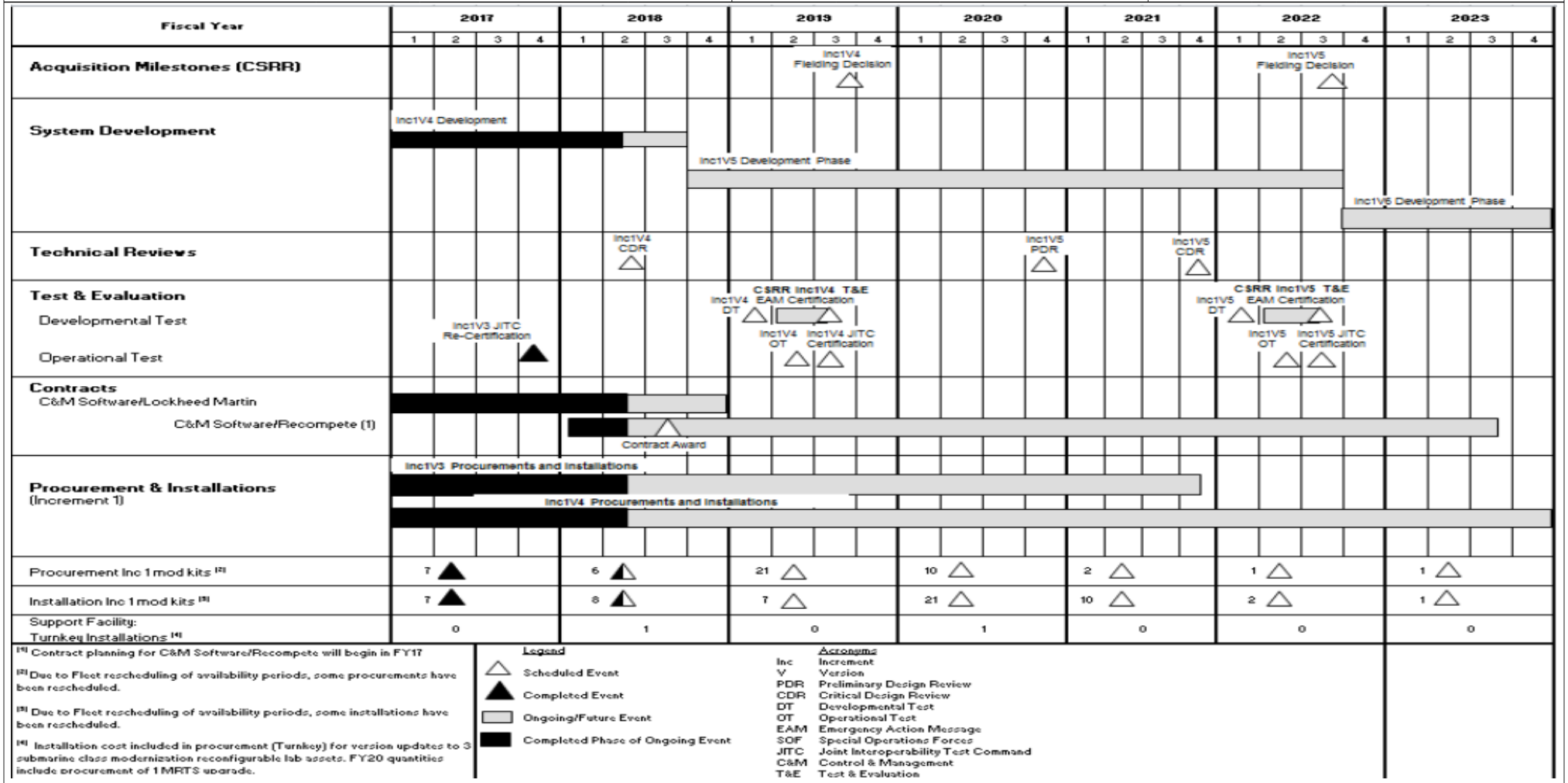
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support (CSRR)	C/CPFF	CSA : San Diego, CA	11.376	0.592	Nov 2016	0.620	Nov 2017	0.626	Nov 2018	-		0.626	Continuing	Continuing	Continuing
Program Management Support (UAC2)	C/CPFF	CSA : San Diego, CA	0.000	0.000		0.600	Nov 2017	0.200	Nov 2018	-		0.200	Continuing	Continuing	Continuing
Program Management Support (Link 16)	C/CPFF	CSA : San Diego, CA	0.000	0.000		0.150	Nov 2017	0.153	Nov 2018	-		0.153	Continuing	Continuing	Continuing
Subtotal			11.376	0.592		1.370		0.979		-		0.979	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	218.531	9.806		19.494		16.068		-		16.068	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*



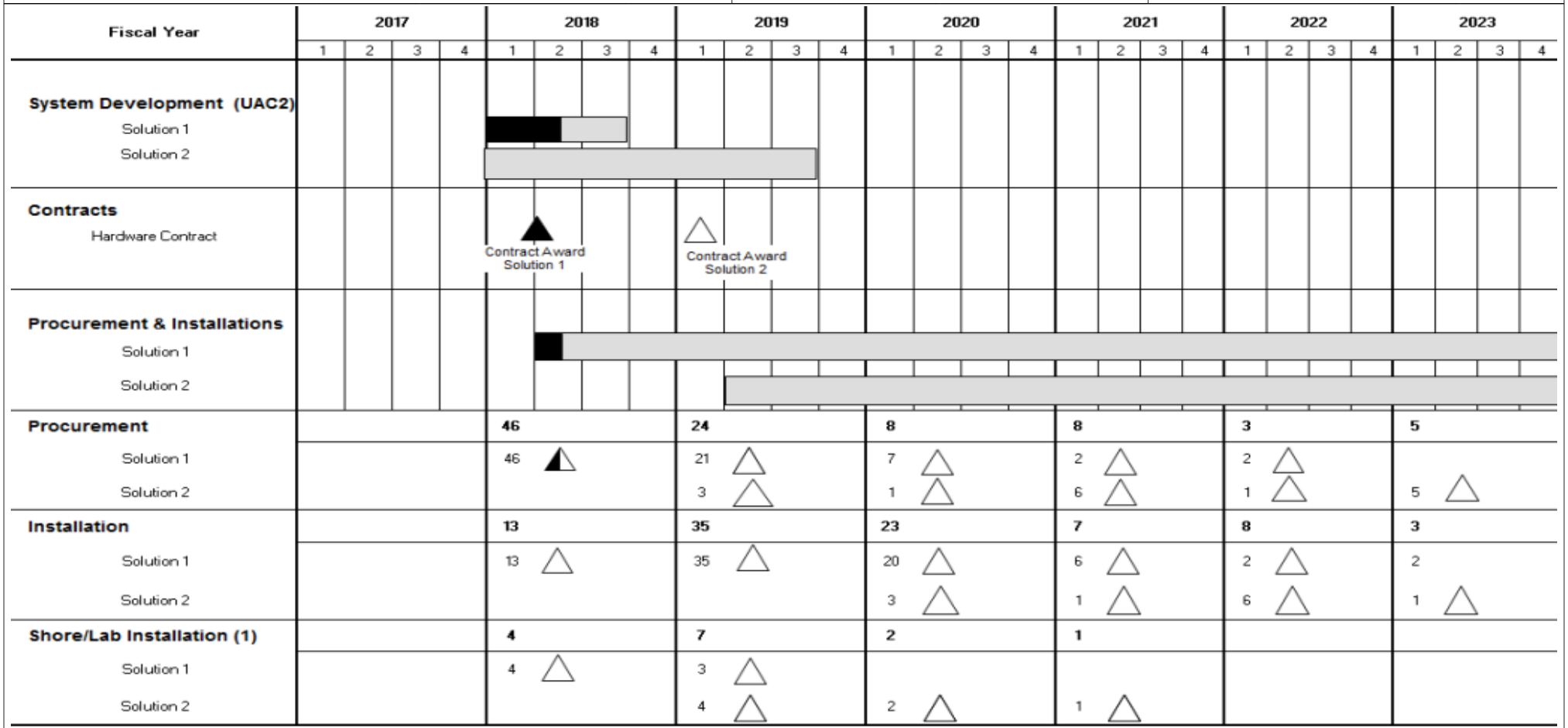
[1] Contract planning for C&M Software/Recompete will begin in FY17

[2] Due to Fleet rescheduling of availability periods, some procurements have been rescheduled.

[3] Due to Fleet rescheduling of availability periods, some installations have been rescheduled.

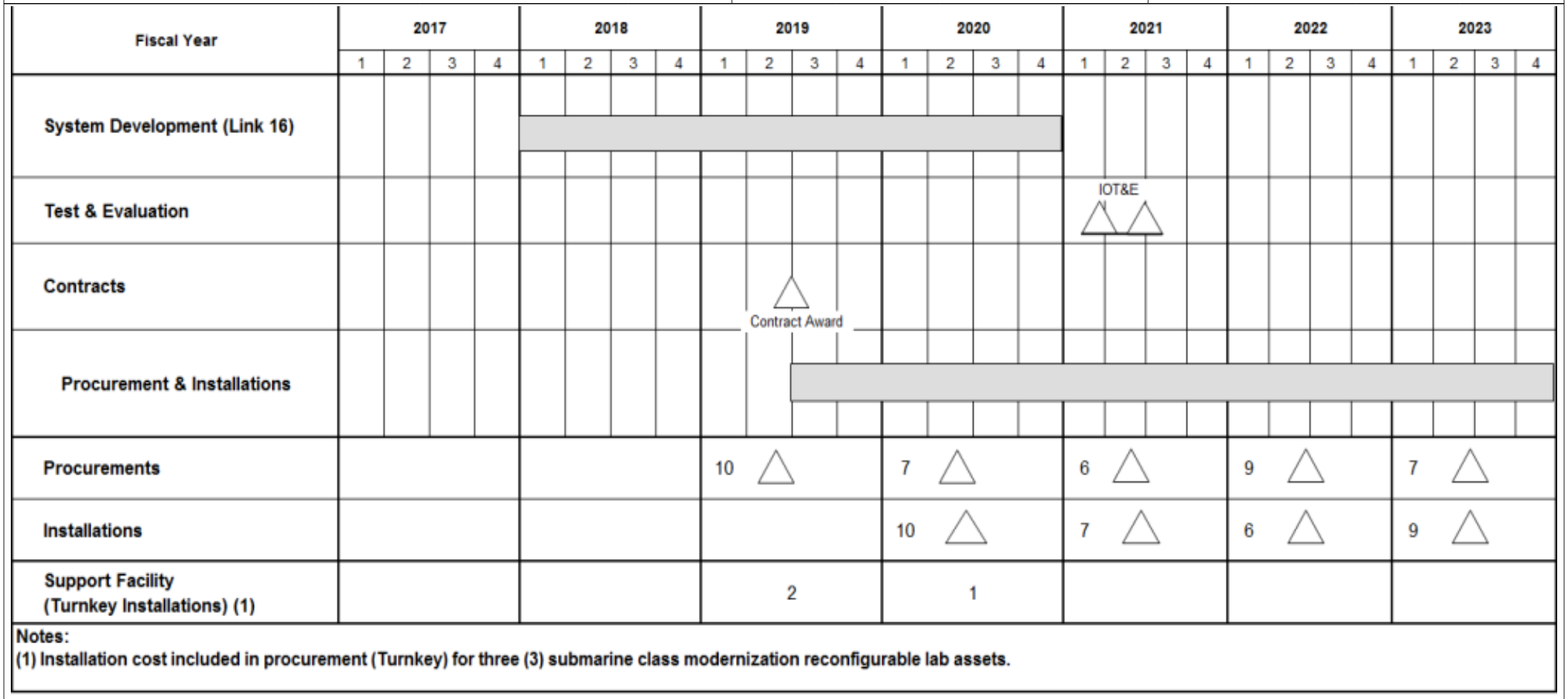
[4] Installation cost included in procurement (Turnkey) for version updates to 3 submarine class modernization reconfigurable lab assets. FY20 quantities include procurement of 1 MRTS upgrade.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*



Notes:
(1) Installation cost included in procurement (Turnkey) for three (3) submarine class modernization reconfigurable lab assets and four (4) Shore sites.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*



Notes:
(1) Installation cost included in procurement (Turnkey) for three (3) submarine class modernization reconfigurable lab assets.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1411				
Fielding Decision (Increment 1 Version 4)	3	2019	3	2019
Fielding Decision (Increment 1 Version 5)	3	2022	3	2022
Technical Reviews (Increment 1 Version 4 Critical Design Review (CDR))	2	2018	2	2018
Technical Reviews (Increment 1 Version 5 Preliminary Design Review (PDR))	4	2020	4	2020
Technical Reviews (Increment 1 Version 5 Critical Design Review (CDR))	4	2021	4	2021
System Development (Increment 1 Version 4)	1	2017	3	2018
System Development (Increment 1 Version 5)	4	2018	3	2022
System Development (Increment 1 Version 6)	4	2022	4	2023
Contracts (Software---Lockheed Martin)	1	2017	4	2018
Contracts (Software-Recompete)	1	2018	3	2023
Emergency Action Message (EAM) Certification (Increment 1 Version 4)	2	2019	3	2019
Emergency Action Message (EAM) Certification (Increment 1 Version 5)	2	2022	3	2022
Increment 1 Version 3 Joint Interoperability Test Command (JITC) Re-Certification	4	2017	4	2017
Increment 1 Version 4 Joint Interoperability Test Command (JITC) Re-Certification	3	2019	3	2019
Increment 1 Version 5 Joint Interoperability Test Command (JITC) Re-Certification	3	2022	3	2022
Developmental Test (DT) (Increment 1 Version 4)	1	2019	1	2019
Operational Test (OT) (Increment 1 Version 4)	2	2019	2	2019
Developmental Test (DT) (Increment 1 Version 5)	1	2022	1	2022
Operational Test (OT) (Increment 1 Version 5)	2	2022	2	2022
Procurement/Installation (Increment 1 Version 3 Modernization Kits)	1	2017	4	2021
Procurement/Installation (Increment 1 Version 4 Modernization Kits)	1	2017	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 1411 / *Sub Tact Comm System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development (Undersea Assured Command & Control (UAC2) Solution 1)	1	2018	3	2018
System Development (UAC2) Solution 2)	1	2018	3	2019
Contract Award (UAC2) Solution 1)	2	2018	2	2018
Contract Award (UAC2) Solution 2)	1	2019	1	2019
Procurement/Installation (UAC2) Solution 1)	2	2018	4	2023
Procurement/Installation (UAC2) Solution 2)	2	2019	4	2023
System Development (Link 16)	1	2018	4	2020
Contract Award (Link 16)	2	2020	2	2020
Initial Operational Test and Evaluation (IOT&E) (Link 16)	1	2021	2	2021
Procurement (Link 16)	3	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604503N / *SSN-688 & Trident Modernization*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	6.770	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.770
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Submarine Support Equipment Program (SSEP) seeks to develop or transition from the Advanced Submarine Support Equipment Program (ASSEP) and Future Naval Capability (FNC) efforts to all Technical Insertions (TIs).

The SSEP is responsible for the development and improvement of submarine Electronic Warfare (EW) systems in support of effective operations in the following mission areas: Joint Littoral Warfare; Joint Intelligence Surveillance Reconnaissance (ISR), Indications and Warnings; Electronic Warfare; Information Operations including Cyber; and Special Operations Force (SOF) support. The rapid proliferation of complex radar, communications and navigation equipment available to potential adversaries creates an increasingly dense and sophisticated electromagnetic environment. Sustained and significant improvements to submarine EW systems are required to maintain tactical ship safety and operational effectiveness. As such, EW was raised to a submarine primary mission area in FY2012 by Commander Submarine Forces, and EW is listed as the number one modernization requirement by the Submarine Tactical Requirements Group (STRG).

The RDTE funding line supports the development of capability improvements to submarine electronic surveillance measures that are used to detect, classify, localize, and record radar and communications signals. These enhancements would allow current technology to keep up with the advances in electronic warfare of our adversaries. The funding line also supports the specific development of AN/BLQ-10 EW capabilities to progress PMS435's efforts to provide maximized electronic spectrum digitization and Low Probability of Intercept (LPI)/ Low Probability of Detection (LPD) radars.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Program Increase	6.770	0.000
FY 2017 Accomplishments: -- Developed and integrated the required software and hardware solutions into the AN/BLQ-10 Electronic Warfare (EW) System that enabled improved human to machine interface (HMI) in the areas of RADAR low probably of interception (LPI), onboard training (OBT) and data recording. -- Developed the EW Tactical TempAlt to deliver EW Server HMI improvements in the areas of RADAR LPI, RADAR narrowband and communications acquisition and direction finding (CADF) signal processing.		
FY 2018 Plans: N/A		
Congressional Adds Subtotals	6.770	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTE/0604503N: *SSN-688 & Trident Modernization*	13.118	9.117	28.408	-	28.408	15.206	14.906	13.985	14.272	Continuing	Continuing
• SCN/2013: *VIRGINIA Class Submarine*	49.168	50.406	51.414	-	51.414	52.442	53.645	54.667	55.706	Continuing	Continuing
• RDT&E/0604558N: *New Design SSN Combat Sys Development*	8.152	1.000	1.020	-	1.020	1.040	1.061	1.082	1.104	Continuing	Continuing
• OPN/0840: *Sub Periscope, Imaging and Supt Equip Prog*	151.963	151.240	178.421	-	178.421	199.590	224.643	215.012	255.918	Continuing	Continuing
• RDT&E/0603595N: *Advanced Submarine System Development*	2.966	2.956	1.965	-	1.965	0.617	0.820	0.974	0.993	Continuing	Continuing

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

The Research Development and Demonstration (RDD) program goal is to respond to urgent operational needs within 30 days and provide for rapid development and fielding of prototype solutions within 270 days.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
H/W & S/W Development	WR	NUWC : Newport, RI	0.000	0.524	Jul 2017	0.000		0.000		-		0.000	0.000	0.524	-
HW & SW Development	C/CPFF	Progeny : Manassas, VA	0.000	5.801	Jul 2017	0.000		0.000		-		0.000	0.000	5.801	-
		Subtotal	0.000	6.325		0.000		0.000		-		0.000	0.000	6.325	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering and Test Support	WR	NUWC : Newport, RI	0.000	0.445	Jul 2017	0.000		0.000		-		0.000	0.000	0.445	-
		Subtotal	0.000	0.445		0.000		0.000		-		0.000	0.000	0.445	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	6.770		0.000		0.000		-		0.000	0.000	6.770	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 9999 / *Congressional Adds*

Fiscal Year	2017				2018				2019				2020				2021				2022				2023			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SBIR Topic N151-036 Manning Reduction and Automation																												
SBIR Topic N151-036 Next Generation Electronic Warfare Human Machine Interface for Submarines																												
EW Server Development and Side-by-Side Digital Server Based-Radar Narrow Band (SB-RNB) technology testing																												

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604503N / *SSN-688 & Trident Modernization*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
AN/BLQ-10A EW Server Build: SBIR Topic N151-036 Manning Reduction and Automation	4	2017	1	2018
AN/BLQ-10A EW Server Build: SBIR Topic N151-036 Next Generation Electronic Warfare Human Machine Interface for Submarines	1	2018	2	2018
AN/BLQ-10A EW Server Build: EW Server Development and Side-by-Side Digital Server Based-Radar Narrow Band (SB-RNB) technology testing	4	2017	1	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604504N *I Air Control*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	147.204	42.206	75.186	62.448	-	62.448	62.325	53.713	43.967	46.956	Continuing	Continuing
0718: *MATCALS*	8.439	0.310	11.508	6.438	-	6.438	6.675	3.158	2.676	2.739	Continuing	Continuing
0993: *Carrier ATC*	110.493	27.071	32.799	33.679	-	33.679	32.863	28.420	23.772	25.439	Continuing	Continuing
1657: *ATC Improvement*	3.445	0.383	0.413	0.419	-	0.419	0.419	0.428	0.438	0.447	Continuing	Continuing
3372: *ATC Systems*	24.827	14.442	30.466	21.912	-	21.912	22.368	21.707	17.081	18.331	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $2.133 million in ATC Systems to account for the availability of prior year execution balances.

This program element provides for the development, integration, and testing of Automated Air Traffic Control (ATC) hardware and software required to provide improved flight safety and more reliable all-weather ATC and landing system capabilities at Naval Air Stations (NASs) and Marine Corps Air Stations (MCASs) and Fleet Area Control and Surveillance Facilities (FACSFAC) worldwide. Funded programs are required to upgrade or replace aging ATC and landing system equipment on aircraft, aircraft carriers, amphibious ships, NASs, MCASs and Navy/Marine Corps tactical/expeditionary airfields and remote landing sites. These upgrades include addressing broadened CyberSecurity requirements to remain compliant with software CyberSecurity directives and Information Assurance mandates. Virtual Warfare Center (VWC) supports the Marine Air Ground Task Force (MAGTF) Integrated Air and Missile Defense (IAMD) development

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	47.404	75.186	63.645	-	63.645
Current President's Budget	42.206	75.186	62.448	-	62.448
Total Adjustments	-5.198	0.000	-1.197	-	-1.197
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.761	0.000			
• SBIR/STTR Transfer	-0.891	0.000			
• Program Adjustments	0.000	0.000	-0.325	-	-0.325

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604504N *I Air Control*			
• Rate/Misc Adjustments	0.000	0.000	-0.872	-	-0.872
• Congressional Directed Reductions	-2.546	-	-	-	-
Adjustments					

Change Summary Explanation

3372: Contract award (CA), Preliminary Design Review (PDR), Critical Design Review (CDR), and the beginning and time span of the AN/SPN-46 Blk V effort, were moved to reflect an updated development timeline. The new schedule takes into account changes identified by studies and analysis of the technical requirements, availability of resources, and refined cost estimates for the AN/SPN-46 Blk V upgrade. The FY 2019 funding request was reduced by $2.133 million to account for the availability of prior year execution balances.

0993: The AN/SPN-50 development schedule was updated to reflect the result of a 9 month, December 2015 to September 2016, delay to the award of the AN/SPN-50 development contract. SSR/PDR, CDR, Post PDR Review, Pre-CDR configurations, EDM deliveries, and O&M Training, were moved by two quarters. Updated O&M was moved three quarters. AN/SPN - 43 Test and Evaluation schedule for "System Deliveries" was added because of AN/SPN-43 ECP delivered to ships that require testing and evaluation to support the Fleet until SPN-50 is delivered.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / *Air Control*	Project (Number/Name) 0718 / *MATCALS*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0718: *MATCALS*	8.439	0.310	11.508	6.438	-	6.438	6.675	3.158	2.676	2.739	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides for continued development, integration, and testing of hardware and software to meet requirements for all-weather operations and improved flight safety of Air Traffic Control (ATC) and Landing Systems at Marine Corps expeditionary airfields. An Acquisition Decision Memorandum from Jan 2005 approved the use of the U.S. Army AN/TPN-31 Air Traffic Navigation, Integration, and Coordination System (ATNAVICS) to fulfill the Air Surveillance and Precision Approach Radar and Control System (ASPARCS) requirement for Jul 2006. The ATNAVICS will replace the legacy ATC Precision Approach Radar (PAR), Airport Surveillance Radar (ASR), and Command and Control Subsystem with a High Mobility Multipurpose Wheeled Vehicle based PAR, ASR and Command and Control Subsystem. The MROC Decision Memorandum 11-2005 of Dec 2004 outlines the evolutionary improvements required by Headquarters Marine Corps. This program works with the Marine ATC Working Group identifying the requirements to implement the P3I and evolutionary product improvements as required for G/ATOR, ATNAVICS, Expeditionary ATC Towers, and Navigational Aids that support Marine Air Traffic Control Detachments.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: ASPARCS Improvements	0.260	1.608	1.089	0.000	1.089
Articles:	-	-	-	-	-
Description: Investigate and resolve obsolescence issues. Perform studies and analyses to implement P3I and other evolutionary improvements. Develop criteria for existing ASPARCS software to achieve Defense Information Infrastructure-Common Operating Environment Level 5 compliance, Information Assurance, Radar Range Extension and Mapping functionality, and enhanced simulation and training into the existing ASPARCS software. Perform Mode 5/S integration, operational functionality study and analyses with AN/TPN-31(V)7 ATNAVICS System.					
FY 2018 Plans: *Note - The $1.334 million increase in Air Surveillance and Precision Approach Radar Control System (ASPARCS) Improvements is to initiate a Part I ECP for the AN/TSQ-263 Tactical Terminal Communications System (TTCS). This ECP will resolve known obsolescence issues and reduce deployment setup time. Commence the Part I ECP to develop and test a prototype which modernizes the AN/TSQ-263 TTCS. This ECP will reduce system hardware requirements, improve reliability, address obsolescence issues, and reduce					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0718 / *MATCALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
the deployment set-up time. FY18 efforts will include requirements generation, ECP development and initial systems development. ***FY 2019 Base Plans:*** Commence a Part I ECP to develop and test a prototype which upgrades/replaces the current precision approach capability. This ECP will reduce system hardware footprint, improve reliability and meet the requirement for multiple touchdown points. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.519M from FY 2018 to FY 2019 is due to higher priorities within the program.					
Title: Ground/Air Task Oriented Radar System (G/ATOR)	0.050	8.000	2.870	0.000	2.870
Articles:	-	-	-	-	-
Description: G/ATOR is multi-role, ground-based, expeditionary radar that replaces five legacy radar systems for the Marine Air Ground Task Force. It satisfies the Marine Air Command and Control System and the Ground Counter Fire/ Counter Battery capabilities. The G/ATOR replaces the AN/TPS-63 and complements the AN/TPS-59 long range radar and will provide mobile, multi-functional, three-dimensional surveillance of air breathing targets, detection of cruise missiles and Unmanned Aerial Systems, and the cueing of air defense weapons. The G/ATOR contributes to the extension of Sea Shield/Sea Strike by surveillance and detection of enemy air threats not seen by Navy sensors in the littorals by participating in a cooperative engagement network of sensors and shooters; G/ATOR enables Integrated Fire Control (IFC) and provides engage/fire on remote capability. G/ATOR surveillance coverage with IFC will provide unprecedented reach, volume and precision in the execution of Operational Maneuver From The Sea allowing Naval forces to project and sustain power deep inland. G/ATOR will add Mode 5/S capability, Federal Aviation Administration flight certification requirements, and the ability to integrate with AN/TPN-31(V) ATNAVICS for Precision Approach Radar. This increment of G/ATOR replaces the Marine Corps' AN/TPS-73 radar and the Airport Surveillance Radar portion of the ATNAVICS also known as Air Surveillance and Precision Approach Radar Control System. ***FY 2018 Plans:*** Develop a Test and Evaluation Master Plan (TEMP) that supports the Mode 5/S integration into G/ATOR, includes a Joint Operational Test Approach (JOTA) event required by the Marine Corps and a plan for obtaining					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0718 / *MATCALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
DoD AIMS certification for the G/ATOR platform. Commence system testing of the G/ATOR Mode 5/S integration for FAA and DoD AIMS certification and use by all G/ATOR blocks. ***FY 2019 Base Plans:*** Continue developing the TEMP that supports the Mode 5/S integration into G/ATOR, includes the JOTA event required by the Marine Corps and a plan for obtaining DoD AIMS certification for the G/ATOR platform. Continue system testing of the G/ATOR Mode 5/S integration for FAA and DoD AIMS certification and use by all G/ATOR blocks. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $5.130M from FY 2018 to FY 2019 is due to the ramp down of the G/ATOR development program.					
Title: Virtual Warfare Center Support	0.000	1.900	2.479	0.000	2.479
Articles:	-	-	-	-	-
Description: Virtual Warfare Center (VWC) Support - This project supports fully interactive operator in the loop simulations in support of the Virtual Warfare Center (VWC) in order to quantify USMC Integrated Air and Missile Defense (IAMD) family of systems performance and how it impacts effectiveness in the IAMD mission area. ***FY 2018 Plans:*** *Note-FY18 $1.9 increase is for Virtual Warfare Center (VWC) Support - This project supports fully interactive operator in the loop simulations at the Virtual Warfare Center (VWC) in order to quantify USMC Integrated Air and Missile Defense (IAMD) family of systems performance and how it impacts effectiveness in the IAMD mission area. VWC support encompasses a set of integrated fire control (IFC) activities that also includes concept/CONOPS development, family of systems architecture development, and systems engineering/ integration efforts. Conduct Design of Experiment related to Marine Air Ground Task Force (MAGTF) IAMD capabilities. Provide event technical support for four analysis events. Conduct and document analysis results for USMC stakeholders. ***FY 2019 Base Plans:*** FY19 $0.579 million increase of Virtual Warfare Center funding is in support of integration and continued development of Designs of Experiment related to marine Air Ground Task Force IAMD capabilities.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0718 / *MATCALS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Provide event technical support for additional analysis events. Conduct and document analysis results for USMC stakeholders. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.579M from FY 2018 to FY 2019 is due to the establishment and ramp up of the VWC program.					
Accomplishments/Planned Programs Subtotals	0.310	11.508	6.438	0.000	6.438

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTEN/0204460M: *G/ATOR*	78.860	54.645	45.029	-	45.029	23.927	10.555	12.185	12.336	Continuing	Continuing
• OPN/2820: *Ashore ATC Equipment/MATCALS*	15.822	9.556	5.421	-	5.421	5.528	5.700	5.980	6.136	Continuing	Continuing

Remarks

Ashore ATC Equipment: FY2017-FY2023 reflects MATCALS portion of Ashore ATC Equipment budget.

D. Acquisition Strategy

An Acquisition Decision Memorandum was signed in Jan 2005 approving the procurement of the Army AN/TPN-31 ATNAVICS to fulfill the Air Surveillance and Precision Approach Radar and Control System requirement for July 2006. The MROC Decision Memorandum 11-2005 of December 2004 outlined the evolutionary improvements required by Headquarters Marine Corps. This program has joined with the Army to implement Pre-Planned Product Improvements and evolutionary product improvements.

G/ATOR will add Mode 5/S capability, FAA flight certification requirements, and the ability to integrate with AN/TPN-31 ATNAVICS for Precision Approach Radar.

The Marine Air Traffic Control (ATC) Working Group identified requirements to address obsolescence issues with ATC Expeditionary Towers. These requirements were validated by APX-25 and a Decision Analysis Study was conducted by NAVAIR 4.10. Funding will address development of expeditionary ATC Tower capability improvements via the Engineering Change Proposal process.

E. Performance Metrics

The MATCALS RDTEN funding will be used to continue development of evolutionary improvements envisioned by Headquarters Marine Corps for the MATCALS Family of Systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / *Air Control*	Project (Number/Name) 0718 / *MATCALS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HDW Develop - ASPARCS Mode 5/S	WR	NAWCAD : Patuxent River, MD	1.277	0.106	Dec 2016	0.673	Feb 2018	0.500	Dec 2018	-		0.500	0.000	2.556	-
Primary HDW Develop - ASPARCS	WR	SPAWARSYSCEN : San Diego, CA	0.510	0.000		0.000		0.000		-		0.000	0.000	0.510	-
Primary HDW Develop - ASPARCS	C/CPFF	TRANDES : San Diego, CA	1.783	0.000		0.000		0.000		-		0.000	0.000	1.783	1.783
		Subtotal	3.570	0.106		0.673		0.500		-		0.500	0.000	4.849	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development - G/ ATOR	WR	NSWC : Dahlgren, VA	0.595	0.024	Jan 2017	2.837	Feb 2018	1.000	Feb 2019	-		1.000	Continuing	Continuing	Continuing
Software Development - ASPARCS	WR	NAWCAD : Patuxent River, MD	3.557	0.106	Dec 2016	0.825	Mar 2018	0.589	Mar 2019	-		0.589	Continuing	Continuing	Continuing
Software Development - Mode 5/S Dev - G/ATOR	SS/CPIF	Telephonics : Huntington Station, NY	0.000	0.024	Jan 2017	4.818	Mar 2018	1.670	Mar 2019	-		1.670	Continuing	Continuing	Continuing
Engineering Support - VWC	TBD	NSMA : TBD	0.000	0.000		1.320	Jan 2018	1.400	Jan 2019	-		1.400	0.000	2.720	-
Software Development - VWC	C/BA	TBD : TBD	0.000	0.000		0.580	Jan 2018	0.919	Jan 2019	-		0.919	0.000	1.499	1.499
		Subtotal	4.152	0.154		10.380		5.578		-		5.578	Continuing	Continuing	N/A

Remarks

FY19 $0.589 million increase of Virtual Warfare Center funding is in support of integration and continued development of Designs of Experiment related to marine Air Ground Task Force IAMD capabilities. The increase is due to the VWC development effort ramping up in order to meet key development milestones in future years.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0718 / *MATCALS*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.517	0.050	Dec 2016	0.155	Jan 2018	0.160	Jan 2019	-		0.160	Continuing	Continuing	Continuing
Program Managemnt Support	WR	G/ATOR : PEO Land Systems	0.200	0.000		0.300	Jan 2018	0.200	Jan 2019	-		0.200	0.000	0.700	-
		Subtotal	0.717	0.050		0.455		0.360		-		0.360	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.439	0.310		11.508		6.438		-		6.438	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0718 / *MATCALS*

MATCALS

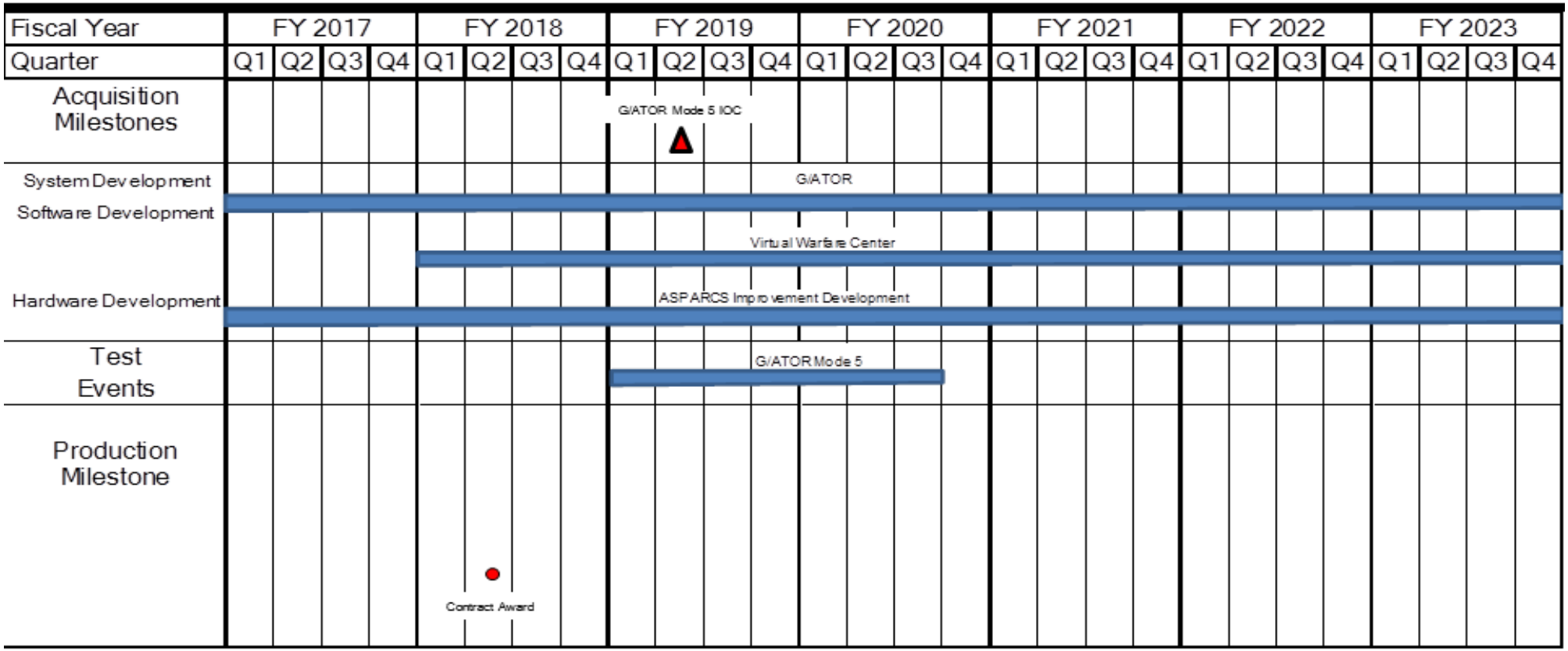


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0718 / *MATCALS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MATCALS				
Acquisition Milestones: G/ATOR Mode 5 IOC	2	2019	2	2019
System Development: Software Development: G/ATOR	1	2017	4	2023
System Development: Software Development: Virtual Warfare Center	1	2018	4	2023
System Development: Hardware Development: ASPARCS Improvements	1	2017	4	2023
Test Events: G/ATOR Mode 5	1	2019	3	2020
Production Milestones: G/ATOR Mode 5 Integration	2	2018	2	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / *Air Control*	Project (Number/Name) 0993 / *Carrier ATC*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0993: *Carrier ATC*	110.493	27.071	32.799	33.679	-	33.679	32.863	28.420	23.772	25.439	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Shipboard Air Traffic Control systems, interfacing with versions of the AN/TPX-42A(V) Direct Altitude and Identity Readout (DAIR), allow shipboard Air Traffic Controllers to identify, marshal, and direct aircraft within a 50 Nautical Mile (NM) radius of the ship. In recent years, the top 25 percent of the AN/SPN-43C frequency band has been reallocated to the Fixed Wireless Access Community prohibiting Air Traffic Control (ATC) Air Search Radar (ASR) operation within 50NM of the coast. Because the Navy requires an air traffic control surveillance radar, this project unit will include engineering efforts to identify requirements and develop the AN/SPN-50(V)1 as an AN/SPN-43C replacement system. In addition, bridging Engineering Change Proposals (ECP) will be required to sustain the AN/SPN-43C capability until the AN/SPN-50(V)1 is completely fielded. Finally, the AN/TPX-42A(V) DAIR continues to undergo several phased upgrades that have resulted in a number of field changes/technology refresh/insertion efforts. System improvements include replacing militarized front-end equipment in the track processor with open architecture Commercial Off the Shelf technology, converting the operational program software to more commonly used and flexible "C" language, providing the "hooks" for potential interface with Mode 5 Identification Friend or Foe, and integrating a flat panel monitor into the controller work station. The development of an ATC common console will reduce operational costs, improve reliability, and provide compatible interfaces and commonality for all ATC workstations. The addition of an embedded trainer within AN/TPX-42A(V) will improve controller training and increase flight safety. This effort includes addressing broadened CyberSecurity requirements to remain compliant with software CyberSecurity directives and Information Assurance mandates.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AN/SPN-50	22.423	22.759	26.428	0.000	26.428
Articles:	1	-	-	-	-
Description: This project funds the development of the AN/SPN-43C replacement program (AN/SPN-50), which was previously funded under AN/SPN-43C and is being broken out for administrative reasons. This system enables Air Traffic Controllers to assure the safe and expeditious movement of air traffic. This capability is an enabler in maintaining launch/recovery cycle times/sortie rates. #3 CVN NARG, #1 ATC NARG priorities.					
FY 2018 Plans: Execute contract Modification for SPN-50 EMD Contract to add incremental funding. Conduct Critical Design Review (CDR). Conduct Test Readiness Review (TRR). EDM #2/3 delivered. Finalize Hardware and Software design of EDM #3 in Post-CDR Configuration. Develop Post-CDR Software Build. Continuation of Systems Integration Lab standup and commence sub-system testing. Development of OEM training for fleet and test operators.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0993 / *Carrier ATC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Execute contract mod(s) for SPN-50 to add incremental funding. Delivery of EDM #3 and modification of EDM #1 and #2 to post-CDR Configuration. Complete the second and final phase of OEM training for fleet and test operators. Conduct development and operational land-based testing (IT-B1) and environmental analysis/testing (IT-B2). Maintenance Demonstrations (M-demos), Built in Test demonstrations (BIT-demos), and Logistics Demonstrations (LOG-demos) will be conducted during the IT-B1 test periods. FY18-19 increase is due to increase in material cost for Solid State Transmitter (SSTx), Unplanned emerging Risk Management Framework and Component Level Environmental Stress Screening (ESS) testing. The AN/SPN-50 development schedule was updated to reflect the result of a 9 month, December 2015 to September 2016, delay to the award of the AN/SPN-50 development contract. SSR/PDR, CDR, Post PDR Review, Pre-CDR configurations, EDM deliveries, and O&M Training, were moved by two quarters. Updated O&M was moved three quarters. AN/SPN - 43 Test and Evaluation schedule for "System Deliveries" was added because of AN/SPN-43 ECP delivered to ships that require testing and evaluation to support the Fleet until SPN-50 is delivered. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $3.669M from FY 2018 to FY 2019 is due to increase in material cost for Solid State Transmitter (SSTx), unplanned emerging risk management framework and Component Level Environmental Stress Screening (ESS) testing.					
Title: AN/SPN-43C	1.263	2.188	2.256	0.000	2.256
Articles:	-	-	-	-	-
Description: Funds development of sustainment Engineering Change Proposals (ECP) for the AN/SPN-43C. The sustainment effort will ensure the capabilities provided by the AN/SPN-43C remain available to CVN, LHA and LHD type ships until the replacement system is fielded. ***FY 2018 Plans:*** Continue sustainment ECPs for AN/SPN-43C ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0993 / *Carrier ATC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continued sustainment ECPs for AN/SPN-43C. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.068M from FY 2018 to FY 2019 is due to inflation and additional ECP support.					
Title: AN/TPX-42	3.385	7.852	4.995	0.000	4.995
Articles:	-	-	-	-	-
Description: This project funds the ongoing modernization of the AN/TPX-42 system through engineering changes and technology refresh, to include CyberSecurity requirements and compliance. Specific engineering changes are: Development of an Air Traffic Control (ATC) Multi-Function Console (MFC) which will reduce operational costs, improve reliability, and provide common hardware for all ATC workstations. Additionally, MFC will provide interfaces for emerging/planned sensors. ***FY 2018 Plans:*** *Note- TPX-42 increase is due to 1) broadened CyberSecurity requirement to remain compliant with software CyberSecurity directives and Information Assurance; and 2) funding provided for TPX-42 hardware and software development so that TPX-42 will interface with EASR sensor. Complete CATCC/DAIR Embedded Trainer ECP to incorporate ATC final control functions; continue Multifunction Console (MFC) ECP. ***FY 2019 Base Plans:*** Continue Multifunction Console (MFC) ECP inclusive of interface development for AN/SPN-50(V)1 and EASR. Begin sustainment ECPs for AN/TPX-42. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $2.857M from FY 2018 to FY 2019 is due to completion of the Embedded Trainer ECP in FY18.					
Accomplishments/Planned Programs Subtotals	27.071	32.799	33.679	0.000	33.679

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0993 / *Carrier ATC*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2830: *Afloat ATC Equipment: SATC*	8.485	8.657	8.593	-	8.593	8.560	8.587	8.738	8.921	Continuing	Continuing

Remarks

Afloat ATC Equipment: FY2017-2023 reflects Ship Air Traffic Control (SATC) portion of the Afloat ATC Equipment budget.

D. Acquisition Strategy

AN/TPX-42 Voice/Video recorder replacement, Joint Precision Approach and Landing System Interface, Shipboard trainer, and Air Traffic Control (ATC) Console are all anticipated ECPs, with improvements being incorporated into the production of AN/TPX-42 upgrade kits.

AN/SPN-50 replacement program is an ACAT IVT program. All other projects are non-ACAT upgrades to existing systems. An evolutionary acquisition approach is being used to introduce these technology advancements that either satisfy user requirements, such as all weather operation, or address supportability and cost of ownership problems.

E. Performance Metrics

AN/SPN-50(V)1 incremental funding procured long lead items to support post-CDR EDM 2QFY18. Attain Milestone C 3QFY20.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0993 / *Carrier ATC*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HDW Develop-TPX-42	WR	NAWCAD : PAX River, MD	4.633	0.360	Dec 2016	0.973	Dec 2017	0.563	Dec 2018	-		0.563	Continuing	Continuing	Continuing
Primary HDW Develop - SPN-43	WR	NAWCAD : PAX River, MD	3.719	0.470	Dec 2016	0.485	Dec 2017	0.475	Dec 2018	-		0.475	Continuing	Continuing	Continuing
Primary HDW Develop - SPN-50(V)1 Pre-CDR Configuration EDM	C/CPIF	SAAB : Syracuse NY	17.951	0.000		0.000		0.000		-		0.000	0.000	17.951	17.951
Primary HDW Develop - SPN-50(V)1 Post-CDR Configuration EDM	C/CPIF	SAAB : Syracuse NY	0.000	12.782	May 2017	8.620	Dec 2017	0.000		-		0.000	8.620	30.022	30.022
Primary HDW EMD - SPN-50(V)1	C/CPIF	SAAB : Syracuse NY	0.000	0.000		5.000	Dec 2017	18.060	Jan 2019	-		18.060	2.000	25.060	25.060
Prior year Prod Dev no longer funded in the FYDP	Various	Various : TBD	17.902	0.000		0.000		0.000		-		0.000	0.000	17.902	-
		Subtotal	44.205	13.612		15.078		19.098		-		19.098	Continuing	Continuing	N/A

Remarks

SPN-50 HDW Development contract award will include the modifications to meet SPN-50 requirements, to include hardware redesign, development, and integration & test of above and below deck hardware to increase redundancy to expand operational availability from 94% to 98%.

The increase in FY19 for Primary HDW EMD is due to Non-recurring Engineering (NRE) increase in developing and testing the EDM as the effort moves to Engineering Manufacturing phase of EMD. Due to evolving Navy policy, Risk Management Framework (RMF) requirements were incorporated into the NRE.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development-TPX-42	WR	NAWCAD : PAX River, MD	17.755	1.700	Dec 2016	3.050	Dec 2017	2.300	Dec 2018	-		2.300	Continuing	Continuing	Continuing
Integrated Logistics Support- TPX-42	WR	NAWCAD : PAX River, MD	1.739	0.120	Dec 2016	0.220	Dec 2017	0.120	Dec 2018	-		0.120	Continuing	Continuing	Continuing
Integrated Logistics Support - SPN-43	WR	NAWCAD : PAX River, MD	0.931	0.200	Dec 2016	0.224	Dec 2017	0.245	Dec 2018	-		0.245	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / *Air Control*	Project (Number/Name) 0993 / *Carrier ATC*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support-SPN-50(V)1	WR	NAWCAD : PAX River, MD	1.505	0.510	Dec 2016	0.806	Dec 2017	0.850	Dec 2018	-		0.850	Continuing	Continuing	Continuing
Studies & Analysis-SPN-50(V)1	WR	NAWCAD : PAX River, MD	4.242	0.763	Dec 2016	0.800	Dec 2017	0.800	Dec 2018	-		0.800	Continuing	Continuing	Continuing
Software Development - SPN-50(V)1	WR	NAWCAD : PAX River, MD	7.012	3.797	Dec 2016	3.702	Dec 2017	2.182	Dec 2018	-		2.182	Continuing	Continuing	Continuing
Studies & Analysis-SPN-43	WR	NAWCAD : PAX River, MD	2.009	0.020	Dec 2016	0.020	Dec 2017	0.020	Dec 2018	-		0.020	Continuing	Continuing	Continuing
Studies & Analysis-TPX-42	WR	NAWCAD : PAX River, MD	0.821	0.100	Dec 2016	0.500	Dec 2017	0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
Systems Engineering-SPN-50(V)1	WR	NAWCAD : PAX River, MD	5.211	2.964	Dec 2016	3.000	Dec 2017	2.822	Dec 2018	-		2.822	Continuing	Continuing	Continuing
Prior Year Support no longer funded in the FYDP	Various	Various : Various	13.393	0.000		0.000		0.000		-		0.000	0.000	13.393	-
Studies & Analysis SPN-50(V)1	WR	Variou : VA	0.000	0.402	Jun 2017	0.000		0.000		-		0.000	0.000	0.402	-
		Subtotal	54.618	10.576		12.322		9.439		-		9.439	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation- TPX-42	WR	NAWCAD : PAX River, MD	2.745	0.400	Dec 2016	0.900	Dec 2017	0.712	Dec 2018	-		0.712	Continuing	Continuing	Continuing
Development Test & Evaluation - SPN-43	WR	NAWCAD : PAX River, MD	1.500	0.573	Dec 2016	1.459	Dec 2017	1.516	Dec 2018	-		1.516	Continuing	Continuing	Continuing
Operational Test & Evaluation-SPN-50(V)1	WR	OPTEVOR : Norfolk, VA	1.100	0.205	Dec 2016	1.840	Dec 2017	1.893	Dec 2018	-		1.893	Continuing	Continuing	Continuing
Prior year T&E no longer funded in the FYDP	Various	Various : Various	1.707	0.000		0.000		0.000		-		0.000	0.000	1.707	-
Development Test & Evaluation SPN-50	WR	NAWCAD : PAX River	0.000	1.000	Dec 2016	0.000		0.000		-		0.000	0.000	1.000	-
		Subtotal	7.052	2.178		4.199		4.121		-		4.121	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0993 / *Carrier ATC*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	American Electronics, Inc. : California, MD	2.795	0.300	Dec 2016	0.500	Dec 2017	0.309	Dec 2018	-		0.309	1.500	5.404	5.404
Program Management Support	WR	NAWCAD : PAX River, MD	1.528	0.350	Dec 2016	0.500	Dec 2017	0.509	Dec 2018	-		0.509	Continuing	Continuing	Continuing
Travel	WR	NAVAIRHQ : PAX River, MD	0.295	0.055	Oct 2016	0.200	Dec 2017	0.203	Dec 2018	-		0.203	Continuing	Continuing	Continuing
		Subtotal	4.618	0.705		1.200		1.021		-		1.021	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	110.493	27.071		32.799		33.679		-		33.679	Continuing	Continuing	N/A

Remarks

Increase in program management support and travel is directly related to the increased efforts in support of SPN-50.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0993 / *Carrier ATC*

AN/SPN-50 Schedule

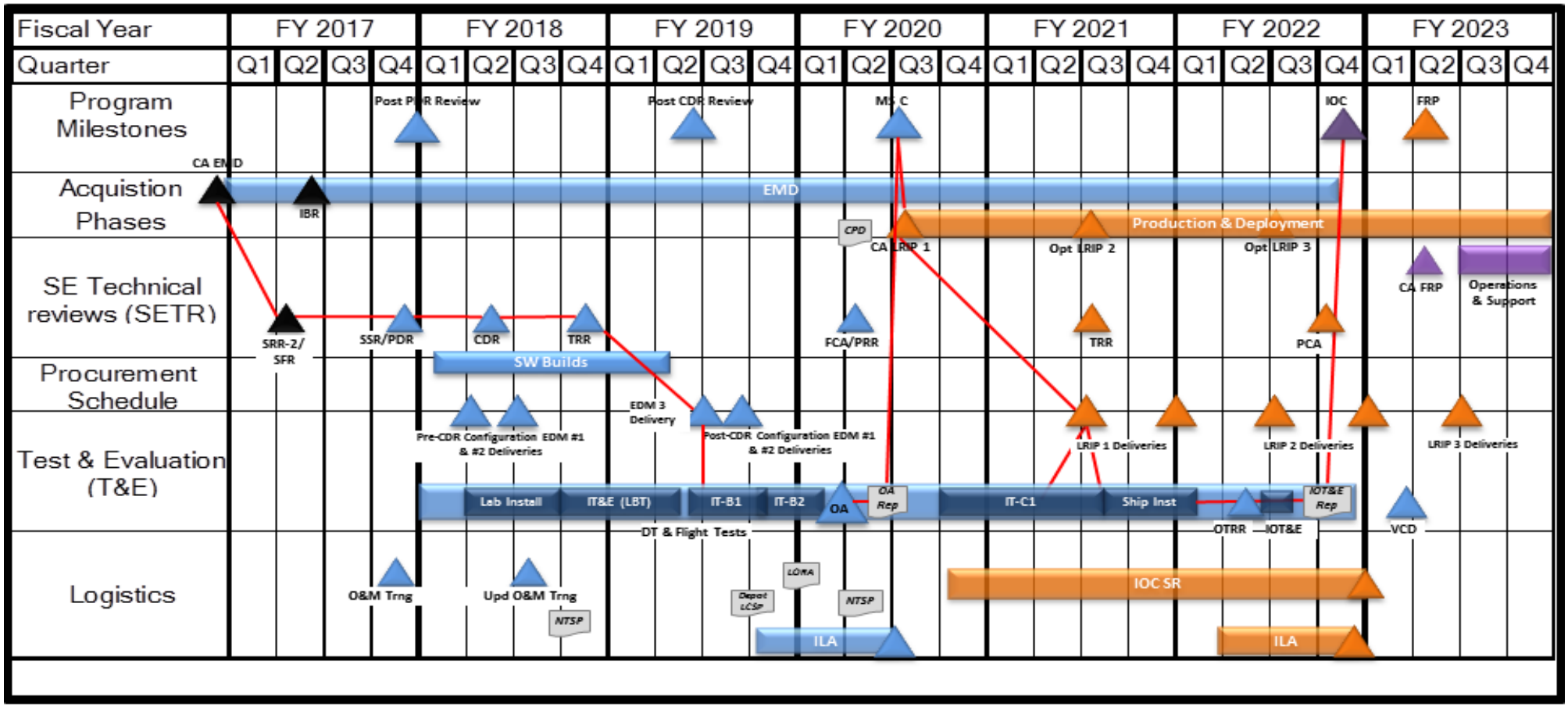


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0993 / *Carrier ATC*

AN/TPX 42/SPN43 SCHEDULE

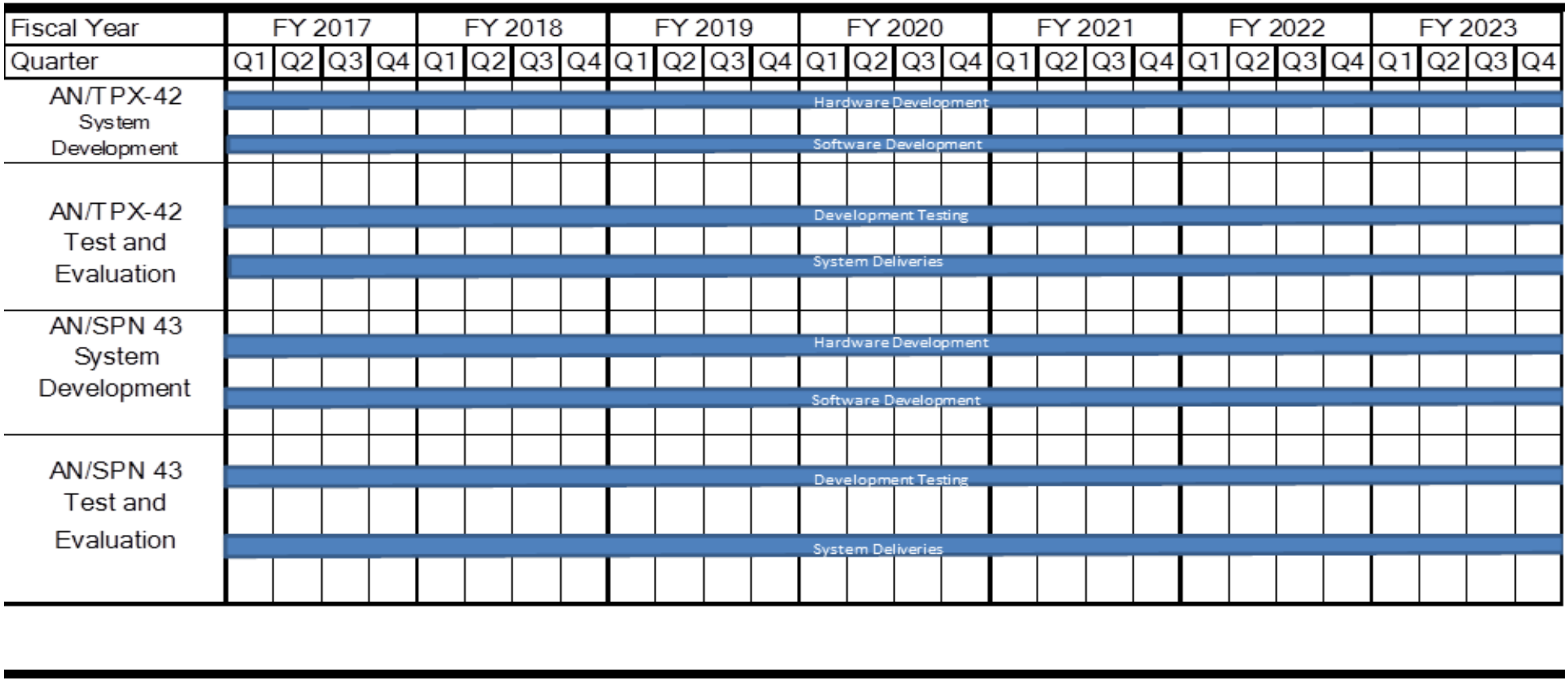


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 0993 / *Carrier ATC*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Carrier ATC				
Acquisition Milestones: Milestones: AN/SPN-50(V)1 Post CDR Review	2	2019	2	2019
Acquisition Milestones: Milestones: AN/SPN-50(V)1 Milestone C	3	2020	3	2020
System Development: Hardware Development: AN/SPN-43C	1	2017	4	2023
System Development: Hardware Development: Quality Design and Build (AN/SPN43C)	4	2017	4	2023
System Development: Hardware Development: AN/TPX-42A(V)	1	2017	4	2023
System Development: Software Development: AN/TPX-42A(V)	1	2017	4	2023
System Development: Reviews: Critical Design Review (CDR) (AN/SPN-50(V)1)	2	2018	2	2018
Page/Group/Row				
Test and Evaluation: Developmental Testing/Operational Testing (AN/SPN-50(V)1)	4	2018	4	2019
Test and Evaluation: Developmental Testing (AN/TPX-42A(V))	1	2017	4	2023
Production Milestones: Developmental Testing (AN/SPN-43C)	1	2017	4	2023
Production Milestones: Contract Awards: (AN/SPN-50(V)1) Post-CDR EDM Contract Award	4	2017	4	2017
Deliveries: Pre-CDR Configuration Prototype Delivery (AN/SPN-50(V)1)	4	2017	4	2017
Deliveries: Post-CDR Configuration Prototype Delivery (AN/SPN-50(V)1)	4	2018	4	2018
Deliveries: System Deliveries (TPX-42A(V))	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / *Air Control*	Project (Number/Name) 1657 / *ATC Improvement*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1657: *ATC Improvement*	3.445	0.383	0.413	0.419	-	0.419	0.419	0.428	0.438	0.447	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides for engineering development, integration, adaptation, and testing of new and/or modernized Air Traffic Control (ATC) systems, air navigational aids, landing systems, and ATC communication systems for Naval and Marine Corps Air Stations (NAS/MCAS) and Fleet ATC Systems. These systems are critical to Naval Aviation and provide for safe, efficient air operations. Additionally, the Federal Aviation Administration (FAA) is affecting major modernization of the National Airspace System (NAS). The Navy must maintain compatibility with FAA-developed ATC systems in order to ensure seamless interoperability within the NAS. NAS modernization initiatives in Project 1657 include the Visual Information Display System (VIDS) and follow-on Pre-Planned Product Improvements, with additional RDT&E efforts required for modified commercial-off-the-shelf ATC systems and equipment for modernization and recapitalization of these systems at our NAS, MCAS & Fleet Area Control & Surveillance Facilities (FACSFACs) worldwide.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NAS MOD VIDS	0.191	0.210	0.210	0.000	0.210
Articles:	-	-	-	-	-
Description: Continue engineering development of pre-planned product improvements for the VIDS and initiate efforts to incorporate VIDS into the FACSFACs. Research display alternatives for Navy ATC systems, and evaluate alternatives for future communication and radar systems.					
FY 2018 Plans: Continue engineering development of Pre-Planned Product Improvement for VIDS to incorporate multiple weather source inputs. Continue STARS and VIDS engineering development for technology insertion. Continue engineering efforts to maintain interoperability with the FAA's next generation air traffic control system.					
FY 2019 Base Plans: Continue engineering development of Pre-Planned Product Improvement for VIDS to incorporate multiple weather source inputs. Continue STARS and VIDS engineering development for technology insertion. Continue engineering efforts to maintain interoperability with the FAA's next generation air traffic control system.					
FY 2019 OCO Plans: N/A					
Title: Fleet ATC Systems	0.192	0.203	0.209	0.000	0.209
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 1657 / *ATC Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Research efforts to determine the best technical approach to integrate various data link and communication system upgrades into Navy/Marine Corps ATC Systems including, but not limited to, the Digital Airport Surveillance Radar (DASR) and the DoD Advanced Automation Systems (DAAS) into the Fleet Area Control and Surveillance Facilities. Evaluate alternative for future processor/display, sensor and communication systems. ***FY 2018 Plans:*** Continue engineering efforts to maintain interoperability with the FAA's next generation air traffic control system. for future processor/display, sensor and communication systems. ***FY 2019 Base Plans:*** Continue engineering efforts to maintain interoperability with the FAA's next generation air traffic control system. Continue evaluation of future processor/display, sensor and communication systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.006M from FY 2018 to FY 2019 is due to inflation.					
Accomplishments/Planned Programs Subtotals	0.383	0.413	0.419	0.000	0.419

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2820: *Ashore ATC Equipment: NASMOD/Fleet ATC*	35.498	35.900	35.696	-	35.696	36.485	37.694	39.444	40.471	Continuing	Continuing

Remarks

Ashore ATC Equipment: FY2017-FY2023 reflects NASMOD and Fleet ATC portions of Ashore ATC budget.

D. Acquisition Strategy

All projects are non-ACAT upgrades to existing systems. An evolutionary acquisition approach is being used to introduce technology advancements that either satisfy emergent requirements or address supportability and cost of ownership problems.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 1657 / *ATC Improvement*

E. Performance Metrics

The Air Traffic Control (ATC) Improvement continues to research, evaluate and develop displays and other alternatives for Navy ATC, communication and radar systems. Maintain compatibility with the FAAs next generation Air Traffic Control System.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 1657 / *ATC Improvement*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HDW Develop - VIDS	WR	SPAWAR Systems Command : Charleston, SC	1.765	0.191	Dec 2016	0.210	Dec 2017	0.210	Dec 2018	-		0.210	Continuing	Continuing	Continuing
Primary HDW Develop - Fleet ATC	WR	SPAWAR Systems Center : Charleston, SC	0.744	0.192	Dec 2016	0.203	Dec 2017	0.209	Dec 2018	-		0.209	Continuing	Continuing	Continuing
		Subtotal	2.509	0.383		0.413		0.419		-		0.419	Continuing	Continuing	N/A

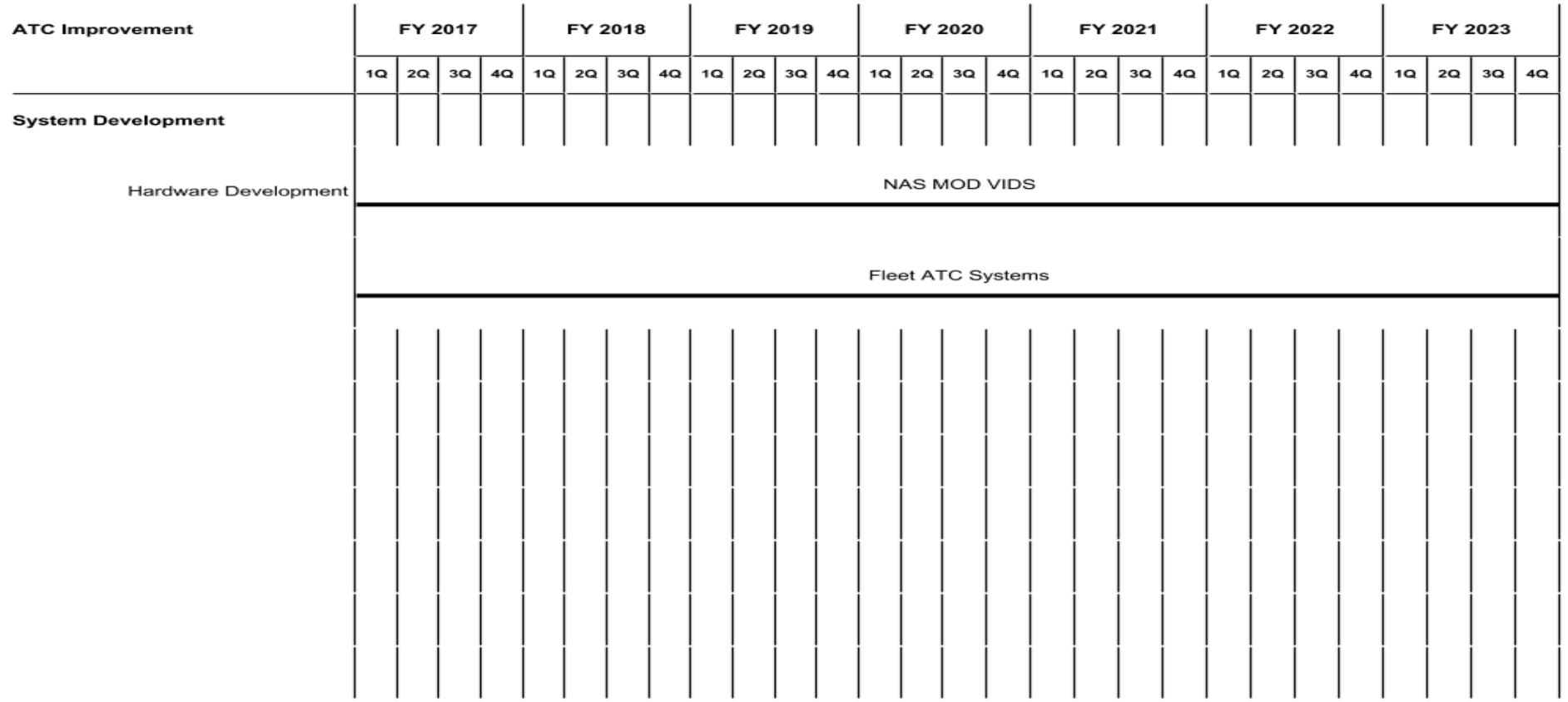
Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	SPAWAR Systems Center : Charleston, SC	0.936	0.000		0.000		0.000		-		0.000	0.000	0.936	-
		Subtotal	0.936	0.000		0.000		0.000		-		0.000	0.000	0.936	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.445	0.383		0.413		0.419		-		0.419	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 1657 / *ATC Improvement*



2019DON - 0604504N - 1657

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 1657 / *ATC Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ATC Improvement				
System Development: Hardware Development: NAS MOD VIDS	1	2017	4	2023
System Development: Hardware Development: Fleet ATC Systems	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / *Air Control*	Project (Number/Name) 3372 / *ATC Systems*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3372: *ATC Systems*	24.827	14.442	30.466	21.912	-	21.912	22.368	21.707	17.081	18.331	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Landing System Upgrade Program (LSUP) is essential to maintain the United States Navy's capability to perform safe and expeditious aircraft landings aboard CVN and LHA/D vessels. The Navy's Precision Approach and Landing Capability requirements have necessitated Life Cycle Extension upgrades to legacy landing systems, AN/SPN-35, AN/SPN-41 and AN/SPN-46. The LSUP program will modernize technology that was developed and fielded over 30 years ago. It is estimated that without these upgrades, the Navy will lose its Automatic Carrier Landing System capability within 5 years. Cyber Security requirements have driven increased efforts to remain compliant with software CyberSecurity directives and Information Assurance mandates. Maintaining compliance is critical to retaining authorization to operate within the Fleet.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AN/SPN-46 Blk IV Upgrade	11.386	17.217	8.534	0.000	8.534
Articles:	-	-	-	-	-
Description: The AN/SPN-46 Blk IV program targets aging and obsolete components within the carrier landing systems and replaces them with modernized and sustainable components. Blk IV consists of antenna pedestal upgrades, addresses transmitter obsolescence issues, and replacement of obsolete circuit cards, and CyberSecurity					
FY 2018 Plans: Pedestal component of the block upgrade will be fabricated and integrated with the new transmitter and circuit cards, support is required for hardware/software integration and development, and test cost increases required for flight testing of the AN/SPN-46 Blk IV with the F/A-18. Complete development of the Blk IV upgrade. Perform flight testing of the antenna and pedestal.					
FY 2019 Base Plans: Install AN/SPN-46 Blk IV pedestal and transmitter on CVN to perform integration and qualification testing.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 3372 / *ATC Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Decrease of $8.683M from FY 2018 to FY 2019 is due to the completion of the AN/SPN-46 Block IV upgrade.					
Title: AN/SPN-35 Blk I Upgrade	3.056	13.249	7.957	0.000	7.957
Articles:	-	-	-	-	-
Description: This accomplishment provides for the development, upgrade, redesign, integration, and testing of the AN/SPN-35C Block I upgrade. AN/SPN-35C is the Precision Approach Radar aboard LHA/LHD class ships and is used for Mode III aircraft recovery which ensures the safe approach and landing of all LH-class embarked aircraft during adverse weather & night conditions. The AN/SPN-35C Block I upgrade will include engineering efforts to upgrade, redesign, replace, and support common failure items. Included in these efforts are changes to obsolete components and analog systems, ensuring the radar capability is available to the fleet and extending the service life of the AN/SPN-35C to 2040.					
FY 2018 Plans: Award contracts for Blk I primary and auxiliary equipment development. Continue development of the Blk I upgrade to include ordering of long lead items for the Radar Processing Controller (RPC), the receiver, main I/O processor, and control indicator. Assess and address broadened CyberSecurity requirements to remain compliant with Information Assurance Mandates.					
FY 2019 Base Plans: Complete development of the AN/SPN-35 Blk I upgrade. Perform Test Readiness Review (TRR) and begin testing.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease of $5.292M from FY 2018 to FY 2019 is due to the ramping down of the AN/SPN-35 Block I Upgrade.					
Title: AN/SPN-46 Block V Upgrade	0.000	0.000	5.421	0.000	5.421
Articles:	-	-	-	-	-
Description: The AN/SPN-46 Block V upgrade targets aging and obsolete hardware and software components within the carrier landing system and replaces them with modernized and supportable components. Blk V consists of a major AN/SPN-46 operational software upgrade along with a refresh of numerous Commercial Off The Shelf (COTS) equipment subassemblies. Planned upgrades are updates to the radar's obsolete radar processor circuit card assemblies (CCAs) with new generation CCAs, upgrading the radar's Real Time Operating System (RTOS) with a current and supportable RTOS, and optimizing and reconfiguring the radar's software					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 3372 / *ATC Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
into a logical, modular format. The radar's top two degraders, the Radar Alignment Mast (RAM) pole and the TS-3098 test set, will be modified with less complex, higher reliability designs. Hardware changes will include reducing reliability issues on outdated bus systems and IP based substructures as well as overall system hardening to mitigate external interference issues. The software architecture redesign and optimization will increase modularity and operational efficiency as well as implement M-Code and resolve cyber security related issues inherent with the current system. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Complete Analysis of Alternatives (AoA) for the individual engineering changes, start engineering designs to support PDR level reviews for the radar CCAs, RTOS, software, RAM pole and the TS-3098 which together comprise the Blk V upgrade. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $5.421M from FY 2018 to FY 2019 is due to the start-up of the AN/SPN-46 Block 5 Upgrade program.					
Accomplishments/Planned Programs Subtotals	14.442	30.466	21.912	0.000	21.912

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2830: *Afloat ATC Equipment/ACLS*	20.926	35.954	39.297	-	39.297	40.705	43.331	43.274	44.182	Continuing	Continuing

Remarks

Afloat ATC Equipment: FY2017-FY2023 reflects ACLS portion of Afloat ATC Equipment budget.

D. Acquisition Strategy

Landing System Upgrade Program consists of lifecycle extension upgrades to the AN/SPN-35C Precision Approach Radar, AN/SPN-41B Instrument Control Landing Systems and AN/SPN-46 Automatic Carrier Landing Systems which support Air Traffic Control (ATC) operations on board CVN, LHA, and/or LHD-class ships. This effort includes numerous commercial off-the-shelf (COTS) component refresh updates which are urgently needed to sustain the operational viability of these Naval ATC

systems supporting fleet air operations for at least the next 15 years until the next generation ATC system is fully implemented. This COTS refresh will include analysis and upgrade of key system components that are critical to overall system operation but have become increasingly difficult to maintain over the past few years. Recent adjustments in the direction and scope of Naval ATC systems have necessitated a re-evaluation of the long-term viability and sustainability of the current Fleet ATC equipment.

The Resources and Requirements Review Board approved the DON Precision Approach and Landing Capability (PALC) Roadmap per Decision Memorandum (DM) Ser: N8B/13U141053 dtd 03 July 2013. This PALC Roadmap re-scoped Joint Precision Approach and Landing System (JPALS) into a single increment and deferred JPALS capability from legacy fleet aircraft. As a result, a requirement to sustain current SPNs through 2030 has emerged. Per Enclosure 1 of the above DM, the Landing Systems Upgrade Program will be comprised of upgrades to the AN/SPN-46, AN/SPN-35C, and AN/SPN-41B. It is anticipated that each SPN upgrade will go through separate Material Development Decisions (MDD) and Milestones.

E. Performance Metrics

Test Readiness Review (TRR) of the AN/SPN-46 Block IV and AN/SPN-35 Block I upgrade.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 3372 / *ATC Systems*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - AN/SPN-46 Blk IV Upgrade	WR	NAWCAD : Patuxent River, MD	9.622	4.903	Nov 2016	7.263	Nov 2017	4.057	Nov 2018	-		4.057	Continuing	Continuing	Continuing
Ancillary Hardware Development - AN/SPN-46 Blk IV Upgrade	C/CPFF	Sierra Nevada Corp (SNC) : Reno, NV	12.737	5.101	Dec 2016	7.120	Dec 2017	0.000		-		0.000	0.000	24.958	24.958
Primary Hardware Development - AN/SPN-35 Blk I Upgrade	WR	NAWCAD : Patuxent River, MD	0.000	2.026	Nov 2016	5.236	Nov 2017	3.455	Nov 2018	-		3.455	Continuing	Continuing	Continuing
Ancilliary Hardware Development - AN/SPN-35 Blk I Upgrade	WR	NAWCAD : Patuxent River, MD	0.000	0.272	Apr 2017	4.083	Nov 2017	2.532	Nov 2018	-		2.532	Continuing	Continuing	Continuing
Primary Hardware Development - AN/SPN - 46 Blk V Upgrade	C/CPFF	TBD : TBD	0.000	0.000		0.000		4.254	Nov 2018	-		4.254	0.000	4.254	4.254
		Subtotal	22.359	12.302		23.702		14.298		-		14.298	Continuing	Continuing	N/A

Remarks

New cost in FY19 ($4.254 million) is for AN/SPN-46 Block V Upgrade to complete Analysis of Alternatives (AoA) for individual engineering changes, start engineering designs to support PDR level reviews for the radar CCAs, RTOS, software, RAM pole and the TS-3098 which together comprise the Blk V upgrade.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support (ILS)	WR	NAWCAD : Patuxent River, MD	0.442	0.495	Nov 2016	1.275	Nov 2017	1.300	Nov 2018	-		1.300	Continuing	Continuing	Continuing
Systems Engineering Support	WR	NAWCAD : Patuxent River, MD	0.834	0.720	Nov 2016	2.050	Nov 2017	1.995	Nov 2018	-		1.995	Continuing	Continuing	Continuing
		Subtotal	1.276	1.215		3.325		3.295		-		3.295	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 3372 / *ATC Systems*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/SPN-46 Blk IV Upgrade	WR	NAWCAD : Patuxent River, MD	0.187	0.305	Nov 2016	2.312	Nov 2017	2.402	Nov 2018	-		2.402	Continuing	Continuing	Continuing
AN/SPN-35 Blk I Upgrade	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.217	Nov 2018	-		0.217	Continuing	Continuing	Continuing
AN/SPN-46 Blk V Upgrade	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.123	Nov 2018	-		0.123	Continuing	Continuing	Continuing
		Subtotal	0.187	0.305		2.312		2.742		-		2.742	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management (PM) Support	WR	NAWCAD : Patuxent River, MD	0.802	0.510	Nov 2016	0.777	Nov 2017	1.190	Nov 2018	-		1.190	Continuing	Continuing	Continuing
PM Suppt - MSS	C/CPAF	TBD : Patuxent River, MD	0.203	0.110	Nov 2016	0.350	Nov 2017	0.387	Nov 2018	-		0.387	Continuing	Continuing	Continuing
		Subtotal	1.005	0.620		1.127		1.577		-		1.577	Continuing	Continuing	N/A

Remarks

Increase in FY19 Management Services is due to AN/SPN-46 Blk V entering the first full year of development.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	24.827	14.442		30.466		21.912		-		21.912	Continuing	Continuing	N/A

Remarks

Program decrease from FY18 to FY19 represents the progression of AN/SPN-46 Blk IV to completion.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 3372 / *ATC Systems*

ATC Systems

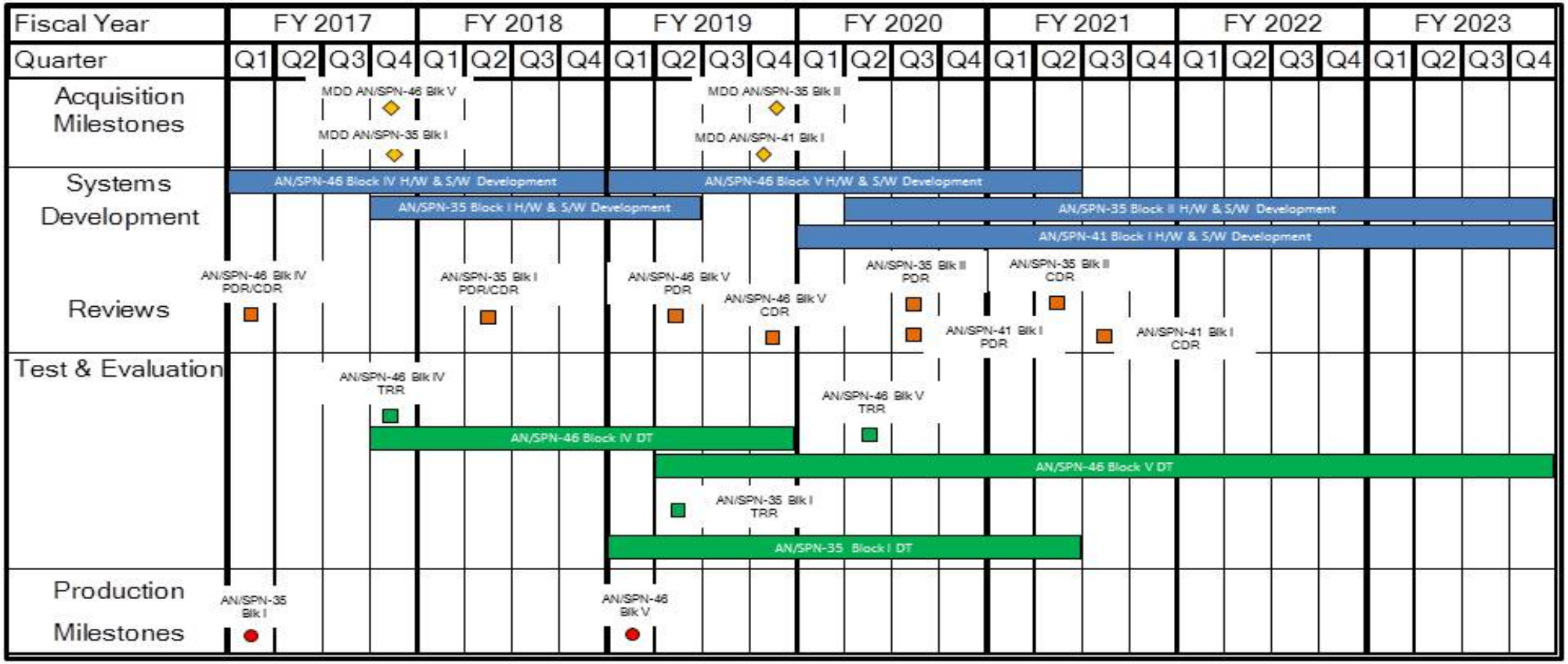


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604504N / *Air Control*	**Project (Number/Name)** 3372 / *ATC Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3372				
Acquisition Milestones: MDD AN/SPN-46 Blk V	4	2017	4	2017
Acquisition Milestones: MDD AN/SPN-35 Blk I	4	2017	4	2017
Acquisition Milestones: MDD AN/SPN-35 Blk II	4	2019	4	2019
Acquisition Milestones: MDD AN/SPN-41 Blk I	4	2019	4	2019
Production Milestones: Contract Award AN/SPN-46 BLK V	1	2019	1	2019
Production Milestones: Contract Award AN/SPN-35 Blk I	1	2017	1	2017

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604512N *I Shipboard Aviation Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	788.796	114.327	177.926	9.710	-	9.710	10.636	11.086	11.848	12.212	Continuing	Continuing
2232: *CV/CVN Launch and Recover*	788.796	110.327	177.926	9.710	-	9.710	10.636	11.086	11.848	12.212	Continuing	Continuing
9999: *Congressional Adds*	0.000	4.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.000

Note

Advanced Arresting Gear (AAG) will be funded under AAG PE 0604530N, PU 2367 in FY 2019 and later.

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.016 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

CV Launch & Recover System - This Navy unique project addresses the System Development and Demonstration (SDD) of systems required to recover and launch Navy/Marine Corps Aircraft (Fixed/Rotary Wing and Vertical/Short Take Off and Landing) operating aboard aircraft carriers, amphibious assault ships and air capable ships. This program element includes the following:

(1) Advanced Arresting Gear (AAG)
(2) Aircraft Launch & Recovery Equipment Modernization
(3) Aircraft Launch and Recovery Equipment Service Life Management program

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604512N *I Shipboard Aviation Systems*

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	112.158	177.926	204.354	-	204.354
Current President's Budget	114.327	177.926	9.710	-	9.710
Total Adjustments	2.169	0.000	-194.644	-	-194.644
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.831	0.000			
• Program Adjustments	0.000	0.000	-194.473	-	-194.473
• Rate/Misc Adjustments	0.000	0.000	-0.171	-	-0.171
• Congressional Add Adjustments	4.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Program Increase*	4.000	0.000
Congressional Add Subtotals for Project: 9999	4.000	0.000
Congressional Add Totals for all Projects	4.000	0.000

Change Summary Explanation

Cost/Summary: AAG funding included under 0604512N is for FY 2018 and prior.

Schedule:
Advanced Arresting Gear (AAG):
Milestone C moved from 4Q FY 2020 to 4Q FY 2021.
Test & Evaluation Jet Car Test Site (JCTS) Test End Date moved from 2Q FY2019 to 4Q FY2020
Test & Evaluation for Runway Arrested landing Site (RALS) Test Start Date moved from 2Q FY2016 to 1Q FY 2017
Test & Evaluation for Runway Arrested landing Site (RALS) Test End Date moved from 1Q FY2020 to 1Q FY2022
Schoolhouse Training Curriculum Development moved from 1Q FY2019 to 4Q FY2019

ALRE Modernization:
Systems Development/Obsolescence Redesign Development and Testing End Date Moved from 4Q FY2022 to 4Q FY 2018.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604512N *I Shipboard Aviation Systems*

Technical: AAG established in its own PE and PU in FY19 and out.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604512N / *Shipboard Aviation Systems*	Project (Number/Name) 2232 / *CV/CVN Launch and Recover*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2232: *CV/CVN Launch and Recover*	788.796	110.327	177.926	9.710	-	9.710	10.636	11.086	11.848	12.212	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

PY article includes AAG Jet Car Track Site and two IMOVLAS production representative models. Service Life Management Program (SLMP) test articles refer to actual units (there are two units per ship set).

A. Mission Description and Budget Item Justification

This Navy unique project addresses the System Development and Demonstration (SDD) of systems required to recover and launch Navy/Marine Corps Aircraft (Fixed/ Rotary Wing and Vertical/Short Take-Off and Landing) operating aboard aircraft carriers (CVN), amphibious assault ships and air capable ships. This program includes the following systems under Project 2232, including the funding of production representative models for:

(1) Advanced Arresting Gear (AAG): The AAG program will design, develop, test and field an aircraft arrestment system to replace the legacy Mark 7 arresting gear. AAG systems will be installed on all new construction aircraft carriers. AAG will provide the U.S. Navy with improved operational capability, while reducing operating and support costs. The AAG system will recover all existing and projected carrier based tail hook-equipped air vehicles well into the 21st century. The AAG Program's SDD phase test article consists of a single wire configured aircraft arresting system, which includes associated hardware and software needed to conduct system integrated testing by arresting both dead-loads and aircraft.

(2) Aircraft Launch & Recovery Equipment (ALRE) Modernization: ALRE Modernization encompasses efforts required to ensure continued functional performance, operational relevance, and cybersecurity accreditation for all product lines across the ALRE program. This includes efforts required to resolve emerging obsolescence issues (both hardware and software), implement fleet driven operational capability upgrades, and comply with cybersecurity requirements and computer task order requirements for security threat mitigation. Effort includes:

(a) Improved Manually Operated Visual Landing Aid System (IMOVLAS): IMOVLAS will be the manual backup for Improved Fresnel Lens Optical Landing System (IFLOLS), which is the primary carrier Visual Landing Aid. IMOVLAS will be used in high sea states or if IFLOLS is inoperable, and will mirror current IFLOLS configuration in size & display.

(3) Aircraft Launch & Recovery Equipment (ALRE) Service Life Management Program (SLMP): The ALRE SLMP for Launcher and Recovery is required to sustain carrier aviation operations of higher energy aircraft launch and recoveries that are increasing loads on the ALRE systems, and that are affecting availability, maintainability and cost. This program will consist of service life assessment and extension initiatives and will establish the design foundation (structural, reliability, and maintainability analyses), permit appropriate assessment, track and focus design changes where most needed. Four SLMP prototypes will be procured in FY 2017 and two in FY 2018.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 2232 / *CV/CVN Launch and Recover*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Advanced Arresting Gear (AAG)	100.402	170.526	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The Advanced Arresting Gear (AAG) program is designing, developing, testing and fielding an aircraft arrestment system to replace the legacy Mark 7 arresting gear. Effort moved to PE 0604530N/ PU 2367 in FY19 and later. ***FY 2018 Plans:*** Continue execution of SDD integrated system performance testing at Jet Car Track Site (JCTS) and Runway Arrested Landing Site (RALS). Conduct manned aircraft arrestment testing on additional fleet type model series aircraft in support of their ARB development. Support engineering being incorporated into the system to improve performance and correct liens/deficiencies. Continue the development of AAG shipboard system/ flight deck certification products (recovery bulletins for F/A-18 variants, and E-2/C-2) and logistics products (e.g. technical manuals and courseware). Continue development of training system for fleet operations and maintenance training. Provide interim training for crews until formal curriculum is completed and approved. Conduct component shock testing and EQT hardware refurbishment to achieve fleet operational requirements. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY 2018 to FY 2019 is due to the Advanced Arresting Gear (AAG) program moving to PE 0604530N/ PU 2367 in FY 2019.					
Title: Aircraft Launch & Recovery Equipment Modernization	1.722	0.575	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Improved Manually Operated Visual Landing Aid System (IMOVLAS) to improve carrier aviation operations. ***FY 2018 Plans:*** IMOVLAS - Continue and complete Integrated Testing (IT). ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 2232 / *CV/CVN Launch and Recover*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY 2018 to FY 2019 is due to the completion of the IMOVLAS efforts in FY 2018.					
Title: Aircraft Launch & Recovery Equipment (ALRE) Service Life Management Program (SLMP) ***Articles:*** ***Description:*** ALRE SLMP analyzes launch and recovery equipment to determine feasible fielded equipment improvements. ***FY 2018 Plans:*** Install and test Crosshead and Fixed Sheave prototypes. Award Main Engine Cylinder contract and procure 2 Main Engine Cylinder prototypes. Continue analysis, design, development and testing of Mark 7, C-13 and Recovery Assist, Securing and Traversing (RAST) components and subcomponents. ***FY 2019 Base Plans:*** Conduct land-based testing of Crosshead and Fixed Sheave prototypes. Continue analysis, design, development and testing of Recovery Assist, Securing and Traversing (RAST) components and subcomponents. Includes efforts to remove and install prototypes from the test site as well as execute fleet representative traps to compare engineering models for Crosshead and Fixed Sheaves and Main Engine Cylinders. Conduct developmental testing of Advanced Purchase Cables. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY2018 to FY2019 supports the testing of the Recovery Assist, Securing and Traversing (RAST) components and subcomponents as well as the Crosshead, Fixed Sheaves and Main Engine Cylinder prototypes.	8.203 4	6.825 2	9.710 -	0.000 -	9.710 -
Accomplishments/Planned Programs Subtotals	110.327	177.926	9.710	0.000	9.710

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 2232 / *CV/CVN Launch and Recover*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/4213: *Aircraft Launch & Recovery Equipment-Aircraft Launch & Recovery Equipment*	81.428	63.695	65.459	-	65.459	95.428	72.816	73.371	83.861	Continuing	Continuing
• OPN/4217: *Advanced Arresting Gear*	0.000	10.900	11.054	-	11.054	4.723	3.137	2.460	2.513	263.528	298.315
• SCN/2001: *Carrier Replacement Program*	2,626.567	4,461.772	1,598.181	-	1,598.181	2,146.535	3,239.606	2,910.491	3,378.355	10,602.689	52,295.070

Remarks

OPN 4213 includes a portion of line item funding for Aircraft Launch & Recovery Equipment.

D. Acquisition Strategy

Advanced Arresting Gear (AAG): The Navy competitively awarded two Cost Plus Fixed Fee Technical Development phase contracts to develop the AAG system. Upon completion of the Preliminary Design and Integrated Baseline reviews, the Navy awarded a single Cost Plus Award Fee option to General Atomics for the System Development and Demonstration (SDD) phase to develop and demonstrate a production representative AAG at the NAVAIR Lakehurst Jet Car Track Site and Runway Arrested Landing Site. Continuing development on the SDD contract awarded in 2004.

Aircraft Launch & Recovery Equipment Modernization:
Improved Manually Operated Visual Landing Aid System (IMOVLAS): The Navy will develop IMOVLAS using commercial equipment racks, processors and Light Emitting Diodes (LEDs).

Aircraft Launch & Recovery Equipment Service Life Management Program (SLMP): This program will consist of Service Life Assessment and Extension initiatives and will establish the design foundation (structural, reliability and maintainability analyses), permit appropriate assessment, track and focus design changes where most needed.

E. Performance Metrics

Advanced Arresting Gear (AAG) will complete System Development and Demonstration integrated testing at Jet Car Track Site and Runway Arrested Landing Site. AAG will demonstrate its key performance parameters and readiness for operational test.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604512N / *Shipboard Aviation Systems*	Project (Number/Name) 2232 / *CV/CVN Launch and Recover*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Dev-AAG	C/CPAF	Gen Atomics : San Diego, CA	547.730	72.284	Dec 2016	96.769	Dec 2017	0.000		-		0.000	23.709	740.492	740.492
Primary HW Dev-AAG	WR	NAWCAD : Lakehurst, NJ	46.912	10.963	Nov 2016	32.744	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Primary HW Dev - AAG	C/CPAF	ESL : Cranston, RI	2.000	1.300	May 2017	3.531	Dec 2017	0.000		-		0.000	2.714	9.545	9.545
System Eng-AAG	WR	NAWCAD : Lakehurst, NJ	26.229	2.430	Nov 2016	8.706	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Training Development - AAG	WR	NAWCAD : Orlando, FL	0.173	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Primary HW Dev-Modern IMOVLAS	WR	NAWCAD : Lakehurst, NJ	1.990	1.148	Nov 2016	0.211	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
System Eng-Modern IMOVLAS	WR	NAWCAD : Lakehurst, NJ	0.514	0.140	Nov 2016	0.069	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Primary HW Dev-SLMP	WR	NAWCAD : Lakehurst, NJ	12.605	2.649	Nov 2016	1.173	Nov 2017	1.558	Nov 2018	-		1.558	Continuing	Continuing	Continuing
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	52.975	0.000		0.000		0.000		-		0.000	0.000	52.975	-
		Subtotal	691.128	90.914		143.203		1.558		-		1.558	Continuing	Continuing	N/A

Remarks

Note: The contractor General Atomics, San Diego, CA has waived all remaining Award Fees.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ILS-AAG	WR	NAWCAD : Lakehurst, NJ	16.653	2.070	Nov 2016	5.439	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Government Eng Support - AAG	WR	Various : Various	0.000	0.381	Mar 2017	0.409	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
ILS-Modern IMOVLAS	WR	NAWCAD : Lakehurst, NJ	0.228	0.200	Nov 2016	0.110	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604512N / *Shipboard Aviation Systems*	Project (Number/Name) 2232 / *CV/CVN Launch and Recover*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies & Analysis-SLMP	WR	NAWCAD : Lakehurst, NJ	11.089	2.959	Nov 2016	3.684	Nov 2017	2.605	Nov 2018	-		2.605	Continuing	Continuing	Continuing
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	1.741	0.000		0.000		0.000		-		0.000	0.000	1.741	-
		Subtotal	29.711	5.610		9.642		2.605		-		2.605	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev Test & Eval-AAG	WR	NAWCAD : Lakehurst, NJ	49.628	10.242	Nov 2016	22.167	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Operational T&E-AAG	WR	Various : Various	2.289	0.300	Nov 2016	0.306	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Testing-Modern IMOVLAS	WR	NAWCAD : Lakehurst, NJ	0.075	0.234	Nov 2016	0.185	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Materials/Validation Testing-SLMP	WR	NAWCAD : Lakehurst, NJ	10.049	2.595	Nov 2016	1.968	Nov 2017	5.547	Nov 2018	-		5.547	Continuing	Continuing	Continuing
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	3.570	0.000		0.000		0.000		-		0.000	0.000	3.570	-
		Subtotal	65.611	13.371		24.626		5.547		-		5.547	Continuing	Continuing	N/A

Remarks

Remarks: Cost growth from FY18 to FY19 (+$3.579M)in Materials/Validation Testing SLMP includes efforts to remove and install prototypes from the test site as well as execute fleet representative traps to compare engineering models for Crosshead and Fixed Sheaves and Main Engine Cylinders. Growth also includes conducting developmental testing of the Advanced Purchase Cable.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgmt Support	C/CPFF	Sierra : California, MD	1.743	0.295	Dec 2016	0.300	Dec 2017	0.000		-		0.000	1.003	3.341	3.341

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604512N / *Shipboard Aviation Systems*	Project (Number/Name) 2232 / *CV/CVN Launch and Recover*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Reqn	NAVAIR : Patuxent River, MD	0.468	0.037	Oct 2016	0.040	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Program Mgmt Support	Various	Various : Various	0.000	0.100	Dec 2016	0.115	Nov 2017	0.000		-		0.000	0.000	0.215	-
Prior Year Cost No Longer Funded in FYDP	Various	Various : Various	0.135	0.000		0.000		0.000		-		0.000	0.000	0.135	-
		Subtotal	2.346	0.432		0.455		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	788.796	110.327		177.926		9.710		-		9.710	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 2232 / *CV/CVN Launch and Recover*

ALRE SLMP Schedule

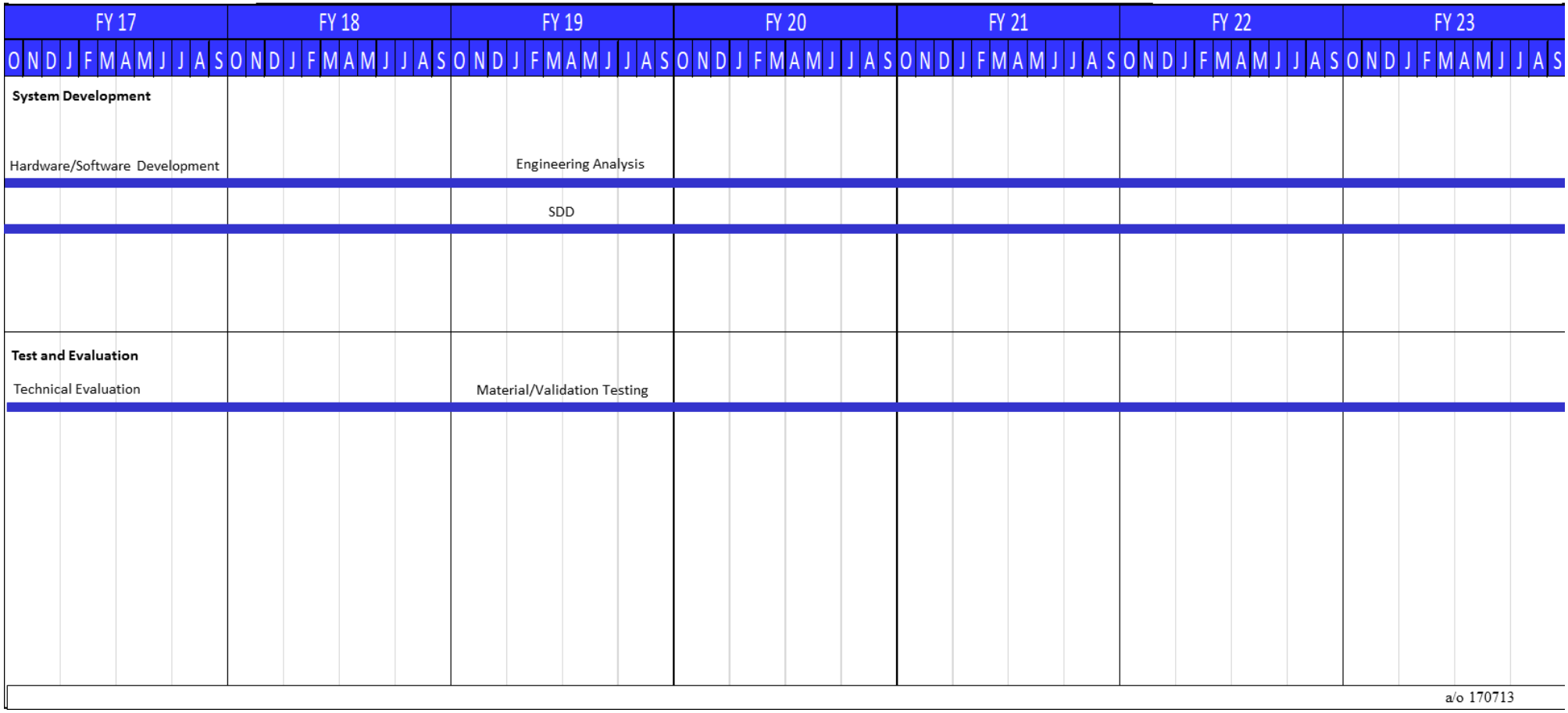


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 2232 / *CV/CVN Launch and Recover*

ALRE Modernization Schedule

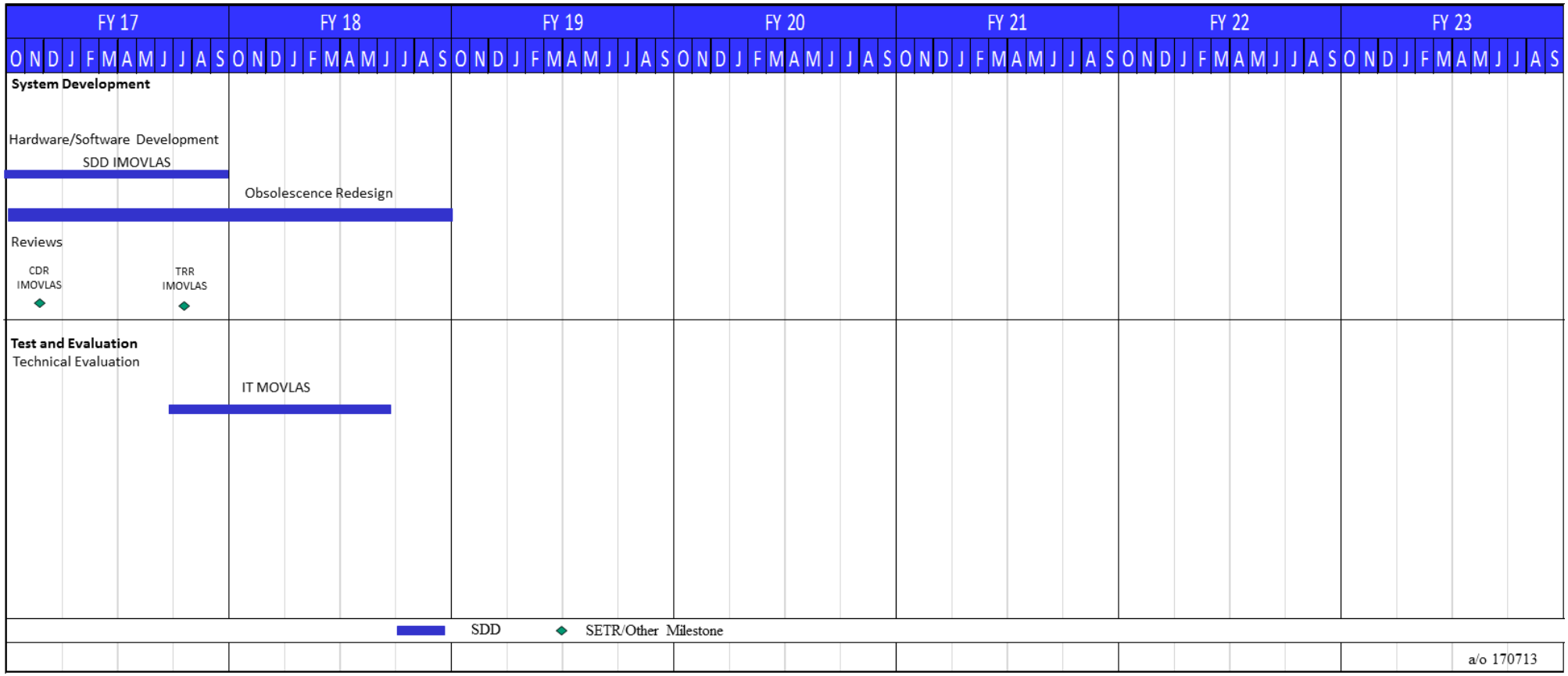


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 2232 / *CV/CVN Launch and Recover*

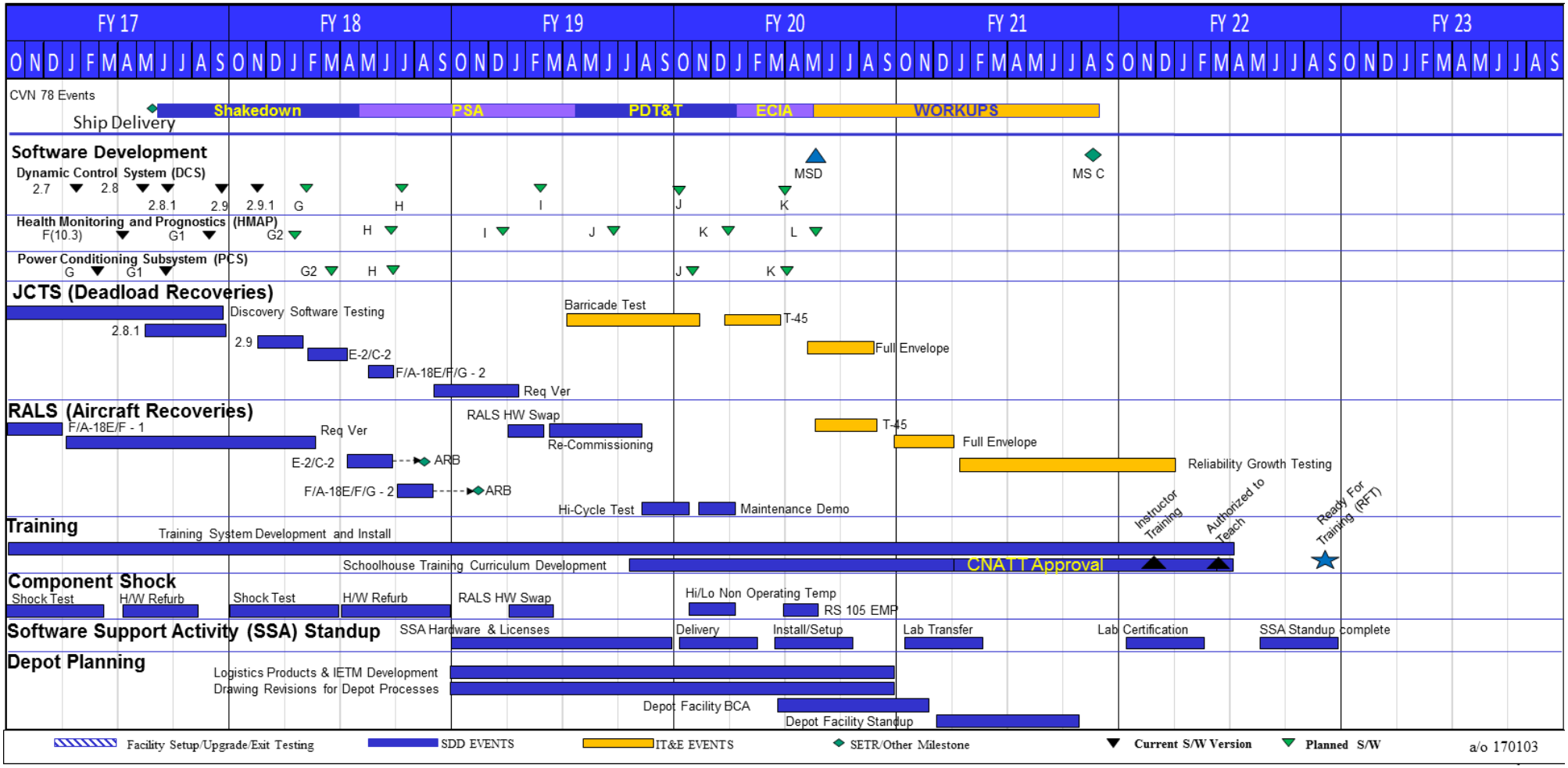


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 2232 / *CV/CVN Launch and Recover*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADVANCED ARRESTING GEAR (AAG)				
Aquisition Milestones: Milestones: Milestone C	4	2021	4	2021
Test & Evaluation: Technical Evaluation: Jet Car Test Site (JCTS) Test	1	2017	4	2020
Test & Evaluation: Technical Evaluation: Runway Arrested Landing Site Test (RALS)	1	2017	1	2022
ALRE SERVICE LIFE MANAGEMENT PROGRAM (SLMP)				
Systems Development: Hardware/Software Development: System Development	1	2017	4	2023
Test & Evaluation: Technical Evaluation: Test & Evaluation	1	2017	4	2023
ALRE MODERNIZATION				
Systems Development: Hardware/Software Development: Obsolescence Redesign Development and Testing	1	2017	4	2018
Test and Evaluation: Technical Evaluation: Integrated Test	4	2017	3	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604512N / *Shipboard Aviation Systems*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	4.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Congressional Add. Program Increase for ALRE Cyber Test & Operations Range (ACTOR).

A. Mission Description and Budget Item Justification

Congressional Add. Program Increase for ALRE Cyber Test & Operations Range (ACTOR).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Program Increase	4.000	0.000
FY 2017 Accomplishments: N/A		
FY 2018 Plans: Develop ALRE Cyber Test & Operation s Range (ACTOR) efforts to include configurator, virtual software environment, operational ALRE software, A-TIC hardware in the loop, interface and test the ACTOR platform (funded with FY17 carry over).		
Congressional Adds Subtotals	4.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not required for Congressional Add.

E. Performance Metrics

Not required for Congressional Add.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604512N / *Shipboard Aviation Systems*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Dev	TBD	TBD : TBD	0.000	3.750	Nov 2017	0.000		0.000		-		0.000	0.000	3.750	-
		Subtotal	0.000	3.750		0.000		0.000		-		0.000	0.000	3.750	N/A

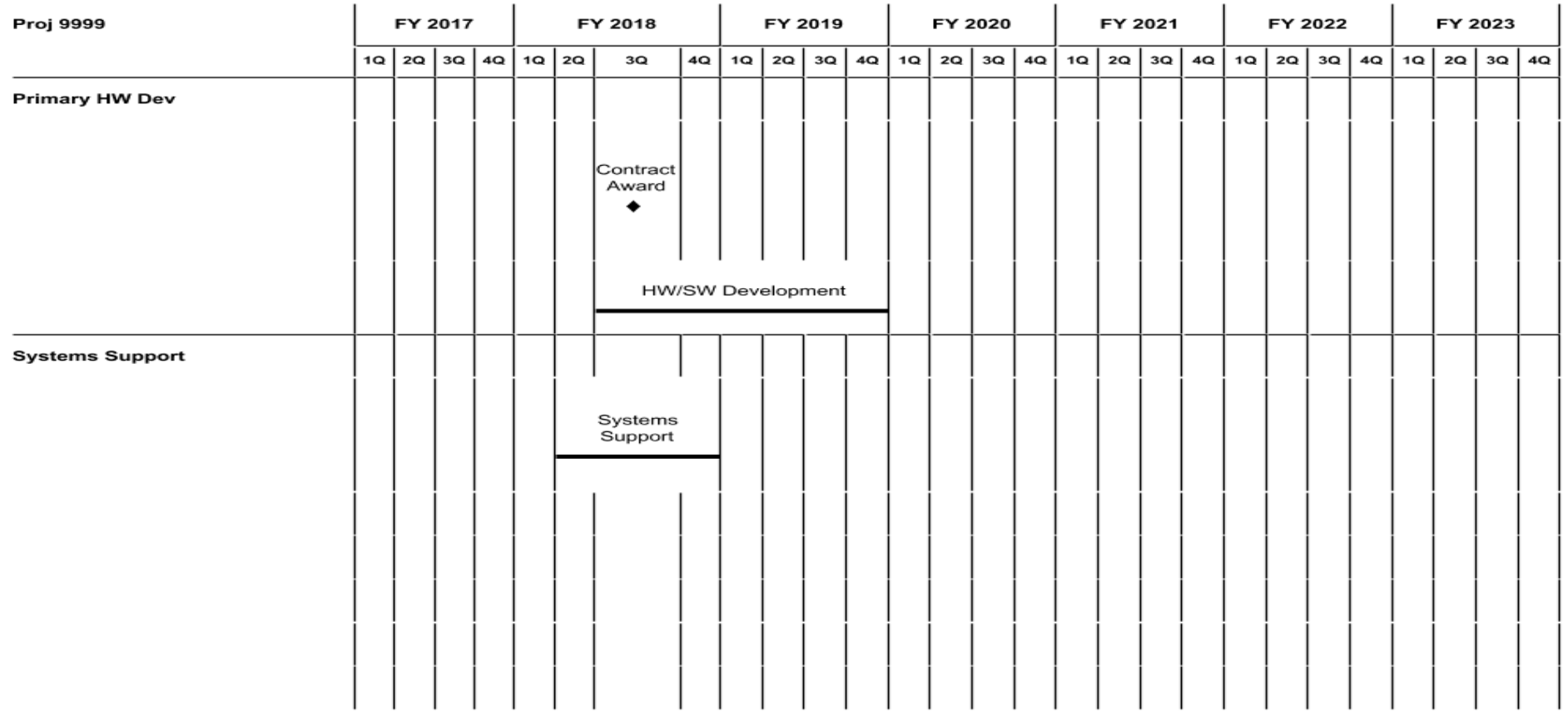
Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Eng Support	WR	NAWCAD : Lakehurst, NJ	0.000	0.250	Sep 2017	0.000		0.000		-		0.000	0.000	0.250	-
		Subtotal	0.000	0.250		0.000		0.000		-		0.000	0.000	0.250	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	4.000		0.000		0.000		-		0.000	0.000	4.000	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*



2019PB - 0604512N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604512N / *Shipboard Aviation Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Primary HW Dev: Hardware/Software Development	3	2018	3	2018
Primary HW Dev: Hardware Software Development	3	2018	4	2019
Systems Support: Systems Support	2	2018	4	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604518N *I Combat Information Center Conv*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	49.280	6.092	8.062	19.303	-	19.303	17.217	13.163	11.321	11.550	Continuing	Continuing
3094: *USW Decision Support*	49.280	6.092	8.062	9.103	-	9.103	9.717	9.763	10.321	10.450	Continuing	Continuing
3439: *Project NAUTICA: Integrated Theater ASW C4I*	0.000	0.000	0.000	10.200	-	10.200	7.500	3.400	1.000	1.100	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.086 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Project 3094: Prior year Undersea Warfare Decision Support System (USW-DSS) funding ended in FY 2013. This represents the restoration of USW-DSS development efforts, re-starting in FY 2017, for the modernization of Program of Record (PoR) Anti-Submarine Warfare (ASW) and Command & Control (C2) systems. Upgrades are required to address Cyber Security and End of Life (EOL) issues, improve capabilities, and in FY 2019 to implement Theater ASW (TASW) capability.

USW-DSS is a C2 capability, identified in the ASW Initial Capabilities Document (ICD), for the Sea Combat Commander (SCC) and Theater USW Commander (TUSWC). It enables effective planning and execution of USW operations, optimizes placement of sensors for exploitation of the environment, manages available resources, balances operations versus risk, and provides a clear vulnerability assessment of the operational environment. USW-DSS provides USW Commanders with an expanded, net-centric USW collaborative capability across Carrier Strike Group (CSG) platforms (CVNs, CG/DDGs, and Integrated Undersea Surveillance System (IUSS)) as well as supporting shore nodes to include Theater Surface Combatants (TSC), Training, Naval Oceanographic Processing Facility (NOPF), and Commander Task Force (CTF).

Future USW-DSS capability is phased to deliver timely and cost-effective software improvements to the warfighter via the Fleet Capability Release (FCR) process.

USW-DSS Build 3/FRC 1 continues the development on the integrated, near-real time, net-centric ASW Common Tactical Picture (CTP) / Common Operational Picture (COP) on an electronic Master Tactical Plot (eMTP) for the TUSWC and critical shore command sites. Additionally, Build 3/FCR 1 will include efforts required to support analysis and trade studies to migrate USW-DSS to the cloud.

USW-DSS processing software is currently hosted on the Consolidated Afloat Networks and Enterprise Services (CANES) and implements a Service-Oriented Architecture (SOA). The current software version, Build 2 Release 3 (B2R3), will continue to field until the follow-on Build 3/FCR 2 (next release of afloat assets) is ready for Initial Operational Capability (IOC) certification in FY 2022.

Project 3439: Effective FY 2019, a new initiative titled Networked Architecture for Undersea Theater Integrated C2 Advantage (NAUTICA) is established for Theater Undersea Warfare (TUSW) architecture development, systems engineering, and design. Significantly, the new initiative integrates intelligence (operational and tactical)

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604518N *I Combat Information Center Conv*

and sensor (national and organic) systems to provide a fully informed Common Operational Picture (COP) of enemy undersea forces, maximizing decision superiority and theater level planning, and address TUSW Command and Control (C2).

The Navy plan for NAUTICA was approved by the June 2017 Flag Oversight Board and subsequently a roadmap was developed in FY 2018. Near term, FY 2019 accelerates development of the interfaces to federate existing "stove-piped" systems. FY 2019 funding will also accelerate the start of the system engineering required to develop and deliver an integrated TUSW capability In Accordance With (IAW) the 2007 ASW ICD. The plan prioritizes NAUTICA investments IAW the Commander U.S. Fleet Forces endorsement of "Theater ASW Capability Requirements" letter (dated 24 February 2017).

FY 2019 funding federates existing systems by rapid prototyping of the designs and interfaces for existing legacy systems to be interoperable by FY 2020, and commences the accelerated design phase for a system of systems TUSW architecture to enable the existing programs of record under development from PWO IWS, PEO C4I, PEO AIR, and N9SP to deliver in the FYDP. Critical to this effort will be the development of the Cross Domain interface that will enable DCGS-N and USW-DSS to exchange and display information at the appropriate classifications.

Funding under this project establishes the systems engineering activities required to accelerate development of TASW capabilities. It will establish a transition path for the Operational Planning Tool (OPT), Waterspace Planner (WASP), Battle Management TDA, and other Future Naval Capabilities (FNCs) that will start to transition Technology Readiness Level (TRL) 5/6 enabling technologies into the USW-DSS and DCGS-N Programs of Record (PORs).

The funding will support TASW C2 experimentation at existing facilities for rapid innovation prototyping and provide a transition path for Phase II SBIR projects that will mature in the FY 2019/2020 timeframe.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	6.283	8.062	8.260	-	8.260
Current President's Budget	6.092	8.062	19.303	-	19.303
Total Adjustments	-0.191	0.000	11.043	-	11.043
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.191	0.000			
• Program Adjustments	0.000	0.000	11.314	-	11.314
• Rate/Misc Adjustments	0.000	0.000	-0.271	-	-0.271

Change Summary Explanation

Funding:

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604518N *I Combat Information Center Conv*

FY 2019: Increase of $+10.2M to begin the development of the interfaces and systems required for the modernization of the TASW watchfloors. FY 2019 starts the rapid prototyping of high priority interfaces to allow the federation of key systems such as USW-DSS and Distributed Common Ground System - Navy (DCGS-N) and the development of multilevel security and or Cross-Domain Solutions that will enable Naval Architecture for Undersea Theater Integrated Command & Control Advantage (NAUTICA) capabilities. Additional $1.0M begins trade studies and analysis of migrating USW-DSS to a cloud-based development environment.

Schedule Changes from PB18 to PB19: The prolonged Continuing Resolution (new start in FY 2017) resulted in the delayed re-start of the USW-DSS Project. Efforts have shifted 1Q to the right, accordingly.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / *Combat Information Center Conv*	Project (Number/Name) 3094 / *USW Decision Support*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3094: *USW Decision Support*	49.280	6.092	8.062	9.103	-	9.103	9.717	9.763	10.321	10.450	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

USW-DSS B2R3 provides integrated, near-real time, net-centric ASW CTP/COP for the carrier strike groups (CSGs). USW-DSS is a C2 capability, identified in the ASW ICD, for the Sea Combat, TUSW, and ASW Commanders, and enables the ability to plan and conduct USW operations, alignment of sensors for exploitation of the environment, allocation of resources, optimization of operations and risk, and vulnerability assessment. USW-DSS provides USW Commanders with an expanded net-centric USW capability across CSG platforms (CVNs, CG/DDGs, and IUSS) as well as supporting shore nodes to include TSCs, Training, NOPF, and CTF.

USW-DSS shortens C2 decision processes for detection-to-engagement across multiple platforms, including those with low-bandwidth communications or intermittent connectivity. For at-sea nodes, USW-DSS software processing requirements are hosted on CANES and implement a SOA while display generation and operator interfaces are provided via USW-DSS hardware.

Starting in FY 2017, funding was restored to commence development of USW-DSS for TUSW (designated USW-DSS Build 3/FCR 1) and to re-architect B2R3 into a Modular Oriented System Architecture (MOSA), implement an electronic Master Tactical Plot (eMTP), modernize the interfaces and displays, and implement new mandated Cyber Security changes, across all afloat platforms and shore sites. Build 3 Fleet Capability Release (FCR) incremental developments will implement cost effective cyber security and TASW functionality by integrating inputs from data sources and platforms such as the P-8, provide improved and additional functionality, and improve stability/reliability.

USW-DSS Build 3 will provide common and improved visualization, integrated USW platform sensor data sharing, reduced data entry, improved sensor performance predictions, data fusion, and reduced redundancy across USW Tactical Decision Aids (TDAs). The program will provide a greater understanding of the undersea battle space by allowing the entire force (carrier/expeditionary strike group, theater, or other) to have a common and thorough understanding of the battle space with characterized uncertainties.

The Navy continues to modernize and add sensor capabilities to existing PORs that are significant data sources of information for USW-DSS. These include, but not limited to, the AN/SQQ-89 Surface ASW Combat System, the AN/SQQ-34 Aircraft Carrier Tactical Support Center (CV-TSC), Global Command and Control System - Maritime (GCCS-M), and the Distributed Common Ground System - Navy (DCGS-N). As the sensor capabilities mature they are incorporated as part of a future FCR.

USW-DSS Build 3 capability will a be phased evolutionary acquisition approach to provide cost-effective capability improvements to the warfighter. The current software version, B2R3 (development completed in FY 2013), will continue to field on afloat platforms until the follow-on Build 3/FCR 2 is certified for Fleet deployment.

In FY 2019, USW-DSS will continue to develop and test the software changes and perform the certification testing necessary to address EOL support issues that will impact B2R3.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

Additionally in FY 2019, funding will be used to develop, design, integrate, and test additional USW-DSS tools/capabilities for B3 including, but not limited to: CTP, Platform Data Fusion Integration, Cross-Platform Data Fusion, Automated Asset Allocation, Asset/Threat State Information, Vulnerability Analysis enhancement, ASW Track Management, Automated Re-planning, Engagement Target Pairing, improved TASW capabilities, Data-Focused Navy Tactical Cloud Integration, and incorporate the eMTP visualization/display service on which to render the CTP/COP.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: USW-DSS Capability Improvements	6.092	8.062	9.103	0.000	9.103
Articles:	-	-	-	-	-
Description: Design, develop, integrate, and test additional USW-DSS tools/capabilities for Build 3 including CTP, Platform Data Fusion Integration, Cross-Platform Data Fusion, Automated Asset Allocation, Asset/Threat State Information, Vulnerability Analysis enhancement, ASW Track Management, Automated Re-planning, Engagement Target Pairing, improved TUSW capabilities, Data-Focused Navy Tactical Cloud Integration, and incorporate the eMTP visualization/display service.					
FY 2018 Plans: - Complete systems engineering efforts on Build 3/FCR 1 to finalize the RDP through formal approval by the Requirements Governance Board (RGB). - Continue development activities on Build 3/FCR 1 to include required acquisition artifacts and technical system design documentation. - Conduct formal System Engineering Technical Reviews (SETR) to assess the technical and programmatic maturity of the development efforts to include a Systems Requirements/Functional Review (SRR/SFR), Preliminary Design Review (PDR), and Critical Design Review (CDR). - Complete interface specifications and draft Interface Control Drawings (ICDs) in preparation for prototype delivery to CTF 34 TASW watchfloor for Composite Training Unit Exercise (COMPTUEX) at-sea event scheduled for 3Q 2018.					
FY 2019 Base Plans: - Begin systems engineering bottoms-up product realization for USW-DSS Build 3/FCR 1. - Conduct formal System Engineering Technical Reviews (SETR) to assess the technical and programmatic maturity of the development efforts to include Software Incremental Reviews (SWIR) and Test Readiness Reviews (TRR), working towards an Element Certification Review (ECR) in FY 2020, ahead of formal fielding of Build 3/FCR 1. - Complete plans supporting early introduction of Build 3/FCR 1 capability through a series of capability drops. - Develop the Cyber Security strategy for USW-DSS Build 3.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Begin up-front systems engineering activities on Build/FCR 2, including development of an Build 3/FCR 2 RDP. - Begin analysis and trade studies for the migration of USW-DSS Build 3 FCR-1 to a cloud-based development environment. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY19 increase of is required to enable analysis and trade studies to migrate USW-DSS to a cloud-based development environment.					
Accomplishments/Planned Programs Subtotals	6.092	8.062	9.103	0.000	9.103

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2176: *USW Support Equipment (N2N6/USW-DSS only)*	7.163	13.653	10.134	-	10.134	9.008	10.339	11.854	14.999	Continuing	Continuing

Remarks

D. Acquisition Strategy

- Hardware/Software development and integration via Navy Warfare Centers and Small Business contractors.
- Utilize SBIR funding and development efforts for open competition on capability improvements to reach TRL 5/6.
- Invest POR funding into maturing SBIR developed technologies beyond TRL 5/6 for integration into USW-DSS and TASW systems via Phase III funding.

E. Performance Metrics

- Deliver incremental FCRs with capabilities in high interest areas that impact Fleet metrics, such as Detect to Engage (DTE) and Fleet readiness.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USW-DSS H/W & S/W Development	C/CPFF	Adaptive Methods : VA	0.000	1.592	Jul 2017	1.129	Dec 2017	1.380	Dec 2018	-		1.380	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	C/CPFF	DH Wagner : PA	0.000	0.000		0.350	Feb 2018	0.400	Dec 2018	-		0.400	0.000	0.750	-
UISW-DSS H/W & S/W Development	WR	NSWC/Carderock : MD	0.000	0.800	Jul 2017	1.000	Oct 2017	1.175	Nov 2018	-		1.175	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	WR	NSWC/Dahlgren : VA	0.000	0.000		0.250	Jan 2018	0.300	Nov 2018	-		0.300	0.000	0.550	-
USW-DSS H/W & S/W Development	WR	NUWC/Keyport : WA	0.000	0.300	Jul 2017	0.500	Oct 2017	0.570	Nov 2018	-		0.570	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	WR	NUWC/Newport : RI	0.000	0.510	Jul 2017	0.940	Oct 2017	1.045	Nov 2018	-		1.045	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	C/CPFF	Progeny : VA	0.000	1.340	Aug 2017	2.100	Jan 2018	2.295	Dec 2018	-		2.295	Continuing	Continuing	Continuing
USW-DSS H/W & S/W Development	C/CPFF	UT/ARL : TX	0.000	0.000		0.175	Dec 2017	0.275	Dec 2018	-		0.275	0.000	0.450	-
Total Prior Year Costs	Various	Var : Var	49.280	0.000		0.000		0.000		-		0.000	0.000	49.280	-
		Subtotal	49.280	4.542		6.444		7.440		-		7.440	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USW-DSS Integration and Test	C/CPFF	Adaptive Methods : VA	0.000	0.250	Jul 2017	0.550	Dec 2017	0.555	Dec 2018	-		0.555	Continuing	Continuing	Continuing
USW-DSS Integration and Test	C/CPFF	Progeny : VA	0.000	1.000	Aug 2017	0.750	Jan 2018	0.790	Dec 2018	-		0.790	Continuing	Continuing	Continuing
		Subtotal	0.000	1.250		1.300		1.345		-		1.345	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / *Combat Information Center Conv*	Project (Number/Name) 3094 / *USW Decision Support*	

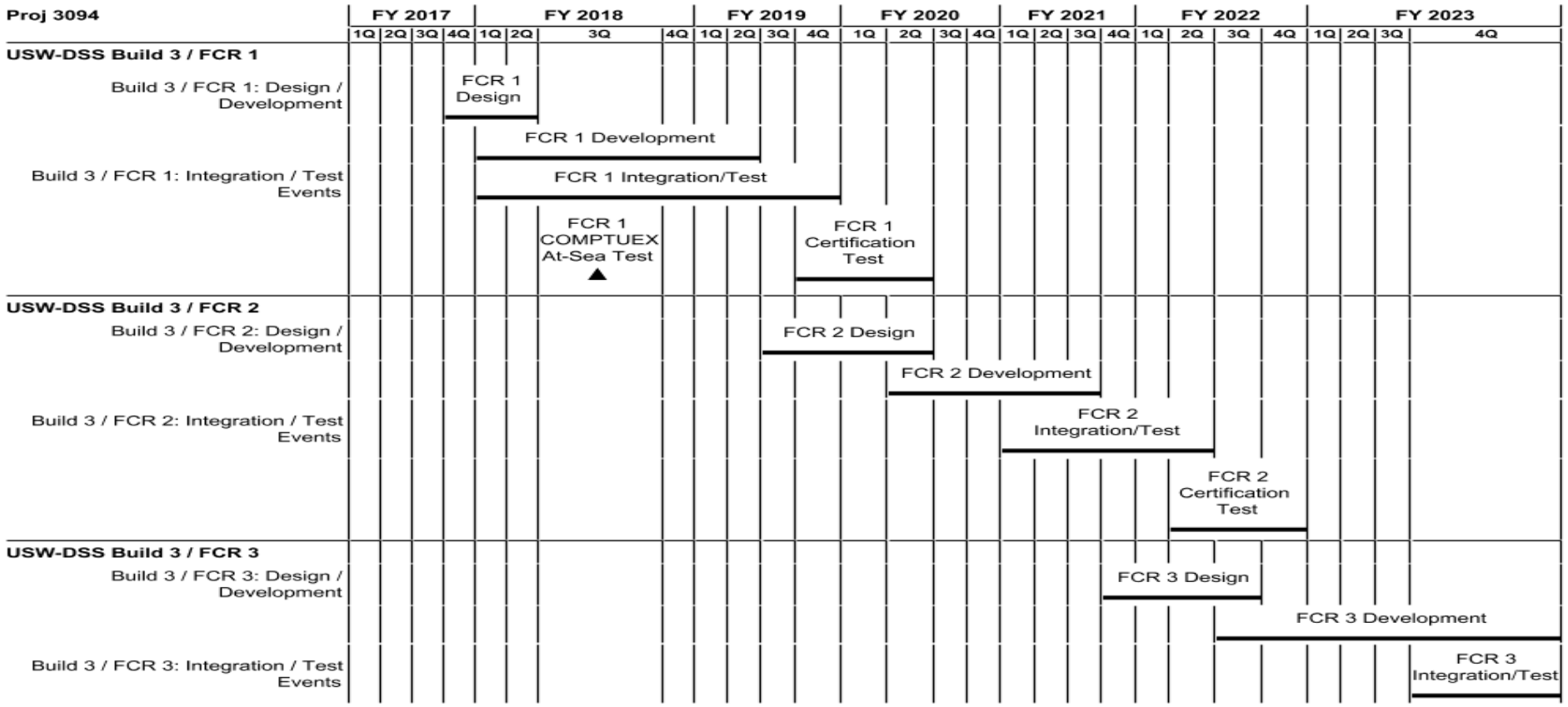
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USW-DSS Program Management Support	C/CPFF	CACI : VA	0.000	0.100	Aug 2017	0.118	Jan 2018	0.118	Dec 2018	-		0.118	Continuing	Continuing	Continuing
USW-DSS Program Management Support	C/CPFF	CGI Federal : VA	0.000	0.200	Aug 2017	0.200	Nov 2017	0.200	Dec 2018	-		0.200	Continuing	Continuing	Continuing
		Subtotal	0.000	0.300		0.318		0.318		-		0.318	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	49.280	6.092		8.062		9.103		-		9.103	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*



2019PB - 0604518N - 3094

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3094 / *USW Decision Support*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3094				
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Design / Development: FCR 1 Design	4	2017	2	2018
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Design / Development: FCR 1 Development	1	2018	2	2019
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Integration / Test Events: FCR 1 Integration & Test	1	2018	4	2019
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Integration / Test Events: FCR 1 COMPTUEX At-Sea Test	3	2018	3	2018
USW-DSS Build 3 / FCR 1: Build 3 / FCR 1: Integration / Test Events: FCR 1 Certification Test	4	2019	2	2020
USW-DSS Build 3 / FCR 2: Build 3 / FCR 2: Design / Development: FCR 2 Design	3	2019	2	2020
USW-DSS Build 3 / FCR 2: Build 3 / FCR 2: Design / Development: FCR 2 Development	2	2020	3	2021
USW-DSS Build 3 / FCR 2: Build 3 / FCR 2: Integration / Test Events: FCR 2 Integration & Test	1	2021	2	2022
USW-DSS Build 3 / FCR 2: Build 3 / FCR 2: Integration / Test Events: FCR 2 Certification Test	2	2022	4	2022
USW-DSS Build 3 / FCR 3: Build 3 / FCR 3: Design / Development: FCR 3 Design	4	2021	3	2022
USW-DSS Build 3 / FCR 3: Build 3 / FCR 3: Design / Development: FCR 3 Development	3	2022	4	2023
USW-DSS Build 3 / FCR 3: Build 3 / FCR 3: Integration / Test Events: FCR 3 Integration & Test	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / *Combat Information Center Conv*	Project (Number/Name) 3439 / *Project NAUTICA: Integrated Theater ASW C4I*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3439: *Project NAUTICA: Integrated Theater ASW C4I*	0.000	0.000	0.000	10.200	-	10.200	7.500	3.400	1.000	1.100	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Effective FY 2019, a new initiative titled NAUTICA is established for TUSW architecture development, systems engineering, and design (+$10.2M). Significantly, the new initiative integrates intelligence (operational and tactical) and sensor (national and organic) systems to provide a fully informed COP of enemy undersea forces, maximizing decision superiority and theater level planning, and address TUSW C2.

The Navy plan for NAUTICA was approved by the June 2017 Flag Oversight Board and subsequently a roadmap was developed in FY 2018. Near term, FY 2019 accelerates development of the interfaces to federate existing "stove piped" systems. FY 2019 funding will also accelerate (from outside the FYDP) the start of the system engineering required to develop and deliver an integrated TUSW capability In Accordance With (IAW) the 2007 ASW ICD. The plan prioritizes NAUTICA investments IAW the Commander U.S. Fleet Forces endorsement of "Theater ASW Capability Requirements" Letter (24 February 2017).

FY 2019 funding federates existing systems by rapid prototyping of the designs and interfaces for existing legacy systems to be interoperable by FY 2020, and commences the accelerated design phase for a system of systems TUSW architecture to enable the existing programs of record under development from PWO IWS, PEO C4I, PEO AIR, and N9SP to deliver in the FYDP. Critical to this effort will be the development of the Cross Domain interface that will enable DCGS-N and USW-DSS to exchange and display information at the appropriate classifications.

Funding under this project establishes the systems engineering activities required to accelerate development of TASW capabilities. It will establish a transition path for the Operational Planning Tool (OPT), Waterspace Planner (WASP), Battle Management TDA, and other FNCs that will start to transition TRL 5/6 enabling technologies into the USW-DSS and DCGSN PORs.

The funding will support TASW C2 experimentation at existing facilities for rapid innovation prototyping and provide a transition path for Phase II SBIR projects that will mature in the FY 2019/2020 timeframe.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NAUTICA - Theater Architecture Development and System Integration	0.000	0.000	10.200	0.000	10.200
Articles:	-	-	-	-	-
Description: FY 2019 initiates the analysis of the TASW Command Center system of systems design and planning. The effort will make specific recommendations for the design and development of the interfaces and					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3439 / *Project NAUTICA: Integrated Theater ASW C4I*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
test procedures for the systems being developed under separate Programs of Record. Specifically, the GCCS-M, USW DSS, DCGS-N, MTC-2 systems have evolved on separate timelines. The funding will develop near term solutions and propose a long range plan for the systems. The investment will, as a first step, design the interfaces that will federate the systems to close the gaps. The objective is to replace the manpower intense operations with machine to machine interfaces, and then assess the warfighting benefit of integration to inform future decisions. This investment addresses TASW C2 needs identified in the ASW ICD. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** - Complete Systems Engineering Top-Down Design for NAUTICA. - Complete requirements definition, requirements analysis, and architecture design. - Develop Requirements Definition Package (RDP). - Develop and approve Systems Engineering Plan (SEP) in accordance with the Defense Acquisition Guidebook (DAG). - Develop plan to migrate to Navy Tactical Cloud environment. - Commence the systems engineering for the transition of Office of Naval Research (ONR) Future Naval Capabilities (FNCs) for Waterspace Management, and Battlespace Awareness Tactical Decision Aids (TDA). - Utilize TASW Tactical Advancements for the Next Generation (TANG) recommendations for CASEBOOK and develop prototypes for evaluation by the Fleet. - Develop interface specifications between systems to support Fleet exercises for early incorporation of P-8 data onto the TASW Command Center. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 is the first year of Project 3439 NAUTICA Integrated Theater ASW C4I.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	10.200	0.000	10.200

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3439 / *Project NAUTICA: Integrated Theater ASW C4I*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2176: *USW Support Equipment (N2N6/USW-DSS only)*	4.463	10.784	7.305	-	7.305	6.058	7.322	8.777	11.852	0.000	97.113

Remarks

D. Acquisition Strategy

- New Theater Architecture Development and System Integration initiative provides the transition funding for the ONR FNC investments, for Water Space Management and including Battlespace Management TDA.
- Capabilities developed under SBIRs and FNCs are incorporated into TASW PoRs, such as USW-DSS, through incremental FCRs.

E. Performance Metrics

- Measure system performance and improvement through System Qualification Testing (SQT) and evaluate the fielded system performance against approved TASW metrics derived from Systems Engineering efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / *Combat Information Center Conv*	Project (Number/Name) 3439 / *Project NAUTICA: Integrated Theater ASW C4I*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TASW Development/ Engineering	C/CPFF	Adaptive Methods : VA	0.000	0.000		0.000		1.825	Dec 2018	-		1.825	Continuing	Continuing	Continuing
TASW Development/ Engineering	MIPR	ADFC : CO	0.000	0.000		0.000		0.720	Dec 2018	-		0.720	Continuing	Continuing	Continuing
TASW Development/ Engineering	C/CPFF	JHU/APL : MD	0.000	0.000		0.000		0.425	Jan 2019	-		0.425	Continuing	Continuing	Continuing
TASW Development/ Engineering	MIPR	MITRE : VA	0.000	0.000		0.000		0.525	Dec 2018	-		0.525	Continuing	Continuing	Continuing
TASW Development/ Engineering	WR	NSA Monterey : CA	0.000	0.000		0.000		0.450	Nov 2018	-		0.450	Continuing	Continuing	Continuing
TASW Development/ Engineering	WR	NAWC/Pax River : MD	0.000	0.000		0.000		0.450	Nov 2018	-		0.450	Continuing	Continuing	Continuing
TASW Development/ Engineering	WR	NSWC/Carderock : MD	0.000	0.000		0.000		0.300	Nov 2018	-		0.300	Continuing	Continuing	Continuing
TASW Development/ Engineering	WR	NSWC/Dahlgren : VA	0.000	0.000		0.000		0.600	Nov 2018	-		0.600	Continuing	Continuing	Continuing
TASW Development/ Engineering	WR	NUWC/Keyport : WA	0.000	0.000		0.000		0.540	Nov 2018	-		0.540	Continuing	Continuing	Continuing
TASW Development/ Engineering	WR	NUWC/Newport : RI	0.000	0.000		0.000		0.465	Nov 2018	-		0.465	Continuing	Continuing	Continuing
TASW Development/ Engineering	C/CPFF	Progeny : VA	0.000	0.000		0.000		1.350	Dec 2018	-		1.350	Continuing	Continuing	Continuing
TASW Development/ Engineering	C/CPFF	SPA : VA	0.000	0.000		0.000		0.425	Dec 2018	-		0.425	Continuing	Continuing	Continuing
TASW Development/ Engineering	WR	SPAWAR : CA	0.000	0.000		0.000		0.890	Nov 2018	-		0.890	Continuing	Continuing	Continuing
TASW Development/ Engineering	C/CPFF	UT/ARL : TX	0.000	0.000		0.000		0.560	Dec 2018	-		0.560	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		9.525		-		9.525	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604518N / *Combat Information Center Conv*	Project (Number/Name) 3439 / *Project NAUTICA: Integrated Theater ASW C4I*	

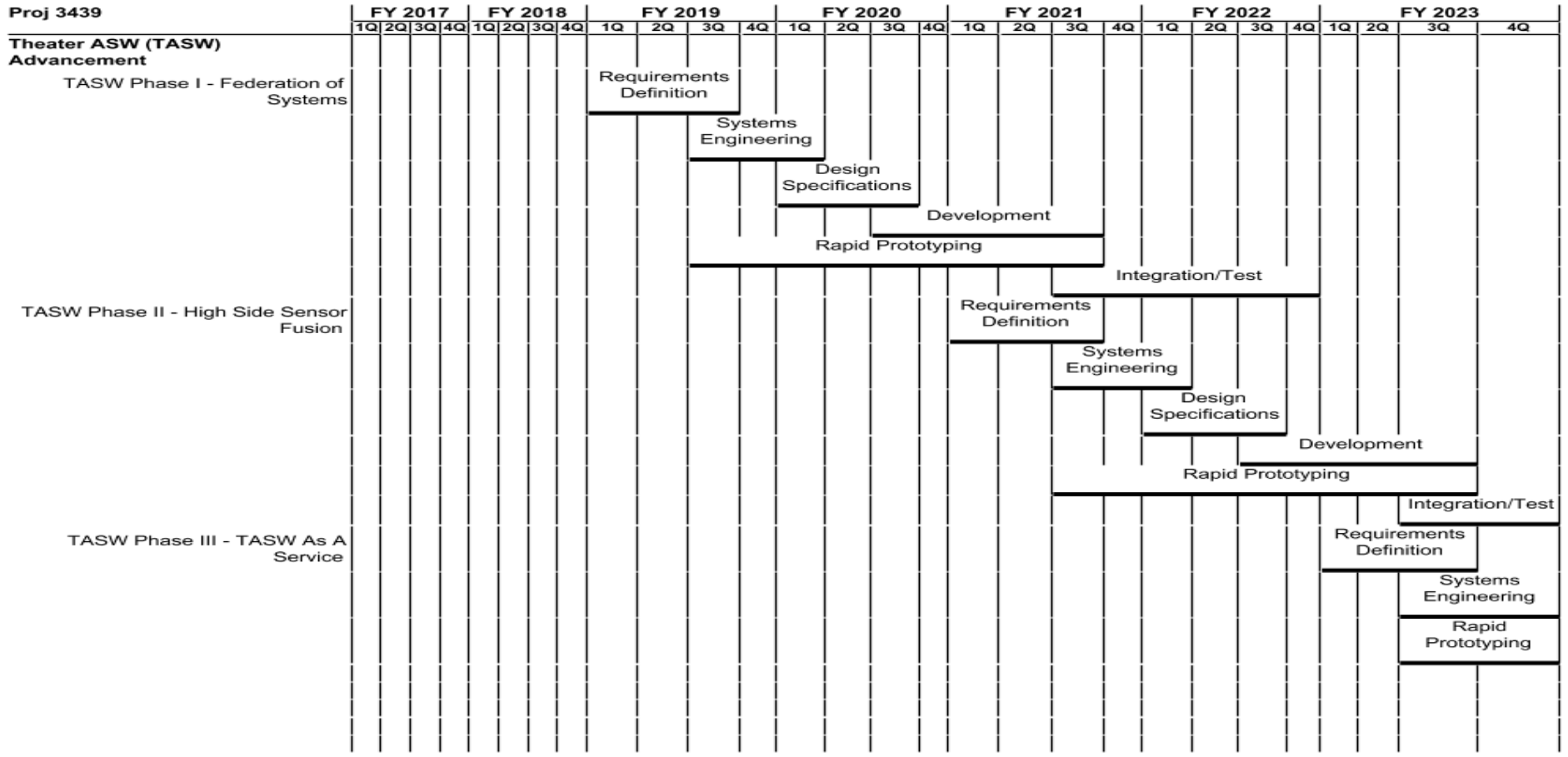
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TASW Program Management Support	C/CPFF	CACI : VA	0.000	0.000		0.000		0.450	Dec 2018	-		0.450	Continuing	Continuing	Continuing
TASW Program Management Support	C/CPFF	CGI Federal : VA	0.000	0.000		0.000		0.225	Dec 2018	-		0.225	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.675		-		0.675	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		10.200		-		10.200	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3439 / *Project NAUTICA: Integrated Theater ASW C4I*



2019PB - 0604518N - 3439

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3439 / *Project NAUTICA: Integrated Theater ASW C4I*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3439				
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Requirements Definition	1	2019	3	2019
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Systems Engineering	3	2019	1	2020
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Design Specifications	1	2020	3	2020
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Development	3	2020	3	2021
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Rapid Prototyping	3	2019	3	2021
Theater ASW (TASW) Advancement: TASW Phase I - Federation of Systems: TASW Phase I - Integration/Test	3	2021	4	2022
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Requirements Definition	1	2021	3	2021
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Systems Engineering	3	2021	1	2022
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Design Specifications	1	2022	3	2022
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Development	3	2022	3	2023
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Rapid Prototyping	3	2021	3	2023
Theater ASW (TASW) Advancement: TASW Phase II - High Side Sensor Fusion: TASW Phase II - Integration/Test	3	2023	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604518N / *Combat Information Center Conv*	**Project (Number/Name)** 3439 / *Project NAUTICA: Integrated Theater ASW C4I*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Theater ASW (TASW) Advancement: TASW Phase III - TASW As A Service: TASW Phase III - Requirements Definition	1	2023	3	2023
Theater ASW (TASW) Advancement: TASW Phase III - TASW As A Service: TASW Phase III - Systems Engineering	3	2023	4	2023
Theater ASW (TASW) Advancement: TASW Phase III - TASW As A Service: TASW Phase III - Rapid Prototyping	3	2023	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604522N *I (U)Air and Missile Defense Radar (AMDR) System*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	353.387	141.338	32.090	27.059	-	27.059	26.835	53.840	61.990	52.015	Continuing	Continuing
3186: *Air and Missile Defense Radar*	353.387	141.338	32.090	27.059	-	27.059	26.835	53.840	61.990	52.015	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): P384

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.006 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Air and Missile Defense Radar (AMDR): (NOTE: FY14 and prior year funding is in PE 0604501N) The AMDR suite is being developed to fulfill Integrated Air and Missile Defense requirements for multiple ship classes. This suite consists of an S-Band radar (AMDR-S), an X-band radar and a Radar Suite Controller (RSC). Funding will develop AMDR-S and RSC, and integrate these components with an available X band radar. AMDR will provide multi-mission capabilities, simultaneously supporting both long range, exoatmospheric detection, tracking and discrimination of ballistic missiles, as well as Area and Self Defense against air and surface threats. For the Ballistic Missile Defense (BMD) capability, increased radar sensitivity and bandwidth over current radar systems are needed to detect, track and support engagements of advanced ballistic missile threats at the required ranges, concurrent with Area and Self Defense against Air and Surface threats. For the Area Air Defense and Self Defense capability, increased sensitivity and clutter capability is needed to detect, react to, and engage stressing Very Low Observable/Very Low Flyer (VLO/VLF) threats in the presence of heavy land, sea, and rain clutter. This effort provides for the development of an active phased array radar with the required capabilities to address the evolving threat. The AMDR suite will obtain performance and technology enhancements throughout its service life based upon an approach that includes modularity of hardware and software, a scalable design and Open Architecture (OA) compliance. The FY21-23 controls include funding for RDT&E efforts to adapt a scaled AMDR on a FLT IIA DDG to deliver Active Electronically-Steered Array and digital beamforming technology. The program is on track to complete developmental testing and deliver to the DDG 51 Flight III.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604522N *I (U)Air and Missile Defense Radar (AMDR) System*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	144.395	32.090	171.384	-	171.384
Current President's Budget	141.338	32.090	27.059	-	27.059
Total Adjustments	-3.057	0.000	-144.325	-	-144.325
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.024	0.000			
• Program Adjustments	0.000	0.000	-144.309	-	-144.309
• Rate/Misc Adjustments	0.000	0.000	-0.016	-	-0.016
• Congressional General Reductions Adjustments	-0.033	-	-	-	-

Change Summary Explanation

Reduction of funding in FY 2019 due to cancellation of procurement of materials and testing of AMDR on the Self Defense Test Ship. Schedule: AMDR Systems integration testing delayed 1 quarter- now completes first quarter 2018.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	Project (Number/Name) 3186 / *Air and Missile Defense Radar*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3186: *Air and Missile Defense Radar*	353.387	141.338	32.090	27.059	-	27.059	26.835	53.840	61.990	52.015	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P384

A. Mission Description and Budget Item Justification

Reduction of funding in FY 2019 due to cancellation of procurement of materials and testing of AMDR on the Self Defense Test Ship.

Air and Missile Defense Radar (AMDR): (NOTE: FY14 and prior year funding is in PE 0604501N) The AMDR suite is being developed to fulfill Integrated Air and Missile Defense requirements for multiple ship classes. This suite consists of an S-Band radar (AMDR-S), an X-band radar and a Radar Suite Controller (RSC). Funding will develop AMDR-S and RSC, and integrate these components with an available X band radar. AMDR will provide multi-mission capabilities, simultaneously supporting both long range, exoatmospheric detection, tracking and discrimination of ballistic missiles, as well as Area and Self Defense against air and surface threats. For the Ballistic Missile Defense (BMD) capability, increased radar sensitivity and bandwidth over current radar systems are needed to detect, track and support engagements of advanced ballistic missile threats at the required ranges, concurrent with Area and Self Defense against Air and Surface threats. For the Area Air Defense and Self Defense capability, increased sensitivity and clutter capability is needed to detect, react to, and engage stressing Very Low Observable/Very Low Flyer (VLO/VLF) threats in the presence of heavy land, sea, and rain clutter. This effort provides for the development of an active phased array radar with the required capabilities to address the evolving threat. The AMDR suite will obtain performance and technology enhancements throughout its service life based upon an approach that includes modularity of hardware and software, a scalable design and Open Architecture (OA) compliance. The FY21-23 controls include funding for RDT&E efforts to adapt a scaled AMDR on a FLT IIA DDG to deliver Active Electronically-Steered Array and digital beamforming technology. The program is on track to complete developmental testing and deliver to the DDG 51 Flight III.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AMDR HARDWARE (RAYTHEON)	2.052	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	**Project (Number/Name)** 3186 / *Air and Missile Defense Radar*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
Title: AMDR SOFTWARE (RAYTHEON) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A	11.896 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: AMDR DESIGN, SUPPORT, INTEGRATION, TEST AND EVALUATION (RAYTHEON) ***Articles:*** ***FY 2018 Plans:*** - Conduct SVR/FCA/PRR - Provide engineering services support utilizing the Integration & Production Support (I&PS) contract - Complete Systems Integration testing (DT-3) at PMRF Increase in FY18 funding from PB18 primarily due to: - Extension of test activities into 1QFY18 ***FY 2019 Base Plans:*** - Provide engineering services support utilizing the I&PS contract - Provide system engineering and SW support for combat system integration efforts ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in FY19 is due to transition from radar development to integration with the combat system.	57.604 -	21.297 -	18.830 -	0.000 -	18.830 -
Title: DESIGN, SUPPORT, AND INTEGRATION ***Articles:*** ***FY 2018 Plans:***	11.666 -	6.155 -	7.039 -	0.000 -	7.039 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	**Project (Number/Name)** 3186 / *Air and Missile Defense Radar*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Support combat system integration and DDG 51 FLT III integration, including preparing for ACB 20 PDR and Critical Design Review (CDR) - Support completion of DT-3 test activities at PMRF ***FY 2019 Base Plans:*** - Support combat system integration and DDG 51 FLT III integration, including preparing for ACB 20 Critical Design Review (CDR) ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY19 is due to transition from radar development to integration with the combat system.					
Title: TEST AND EVALUATION OPERATIONS AND ANALYSIS	15.817	1.295	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete conduct of DT-3 testing at PMRF, including launch of test targets Increase from PB18 primarily due to: - Labor associated with the extension of test activities into 1Q FY18. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in FY19 is due to this effort ending in FY18.					
Title: TEST AND EVALUATION ASSETS AND FACILITIES	39.156	2.082	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Maintain PMRF test site - Provide PMRF range services in support of completion of DT-3 testing - Provide engineering services in support of completion of DT-3 testing					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	**Project (Number/Name)** 3186 / *Air and Missile Defense Radar*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Decrease from PB18 primarily due to reduced utilization of range time and services. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in FY19 is due to this effort ending in FY18.					
Title: PROGRAM MANAGEMENT ***Articles:*** ***FY 2018 Plans:*** - Analyze and assess contractor deliverables - Assist in cost, schedule, and performance management, contract management and oversight, earned value assessment and risk identification and mitigation - Provide support to IPTs and WGs required to support E&MD and Integration and Production Support (I&PS) contracts - Support the Interim Program Review - Support completion of DT-3 test activities - Provide support to technical interchange incentives ***FY 2019 Base Plans:*** - Provide support to combat system integration effort ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in FY19 is due to minor program and rate adjustments.	3.147 -	1.261 -	1.190 -	0.000 -	1.190 -
Accomplishments/Planned Programs Subtotals	141.338	32.090	27.059	0.000	27.059

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	**Project (Number/Name)** 3186 / *Air and Missile Defense Radar*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/2122: *DDG51*	3,630.751	3,640.792	5,699.221	-	5,699.221	3,837.968	5,146.448	5,196.788	5,326.153	Continuing	Continuing

Remarks

D. Acquisition Strategy

Plans for the Air and Missile Defense Radar are to leverage research and development investments, integrate sufficiently matured advanced technologies from technology risk reduction efforts, and incorporate Open Architecture approaches to develop a scalable radar design with major improvements in power, sensitivity, resistance to natural and man-made environments over current radar systems for simultaneous multi-mission BMD, Area and Self Defense Anti-Air Warfare (AAW). System design will be accomplished by employing proven technologies and commercial standards to lower schedule risk and develop a product with the lowest life-cycle cost.

Program scope consists of the following phases: a Concept Studies phase; a Technology Development phase, which included competitive prototyping; an E&MD phase, which includes completion of a full EDM for land-based testing; and transition to production. The detailed scope of this acquisition is defined in the approved Milestone B AMDR Acquisition Strategy (AS).

E. Performance Metrics

- Complete Engineering Development Model (EDM) testing
- Achieve Milestone C decision to proceed into production and exercise Low Rate Initial Production (LRIP) options
- Conduct SVR/FCA/PRR
- Support ACB 20 and Ballistic Missile Defense (BMD) 6.X PDR and CDR
- Award Integration and Production Support Contract

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	**Project (Number/Name)** 3186 / *Air and Missile Defense Radar*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Manufacturing Development/Engineering Services	C/CPIF	Raytheon : Sudbury, MA	215.687	71.552	Oct 2016	20.932	Oct 2017	8.389	Oct 2018	-		8.389	Continuing	Continuing	Continuing
Integration and Production Support	SS/FFP	TBD : TBD	0.000	0.000		0.365	Aug 2018	10.441	Oct 2018	-		10.441	Continuing	Continuing	Continuing
		Subtotal	215.687	71.552		21.297		18.830		-		18.830	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	MIPR	GTRI : Atlanta, GA	0.687	0.000		0.000		0.000		-		0.000	0.000	0.687	-
Systems Engineering	SS/CPFF	JHU/APL : Laurel, MD	12.183	4.516	Dec 2016	1.855	Feb 2018	2.215	Nov 2018	-		2.215	Continuing	Continuing	Continuing
Systems Engineering	MIPR	MIT : Cambridge, MD	1.567	0.683	Mar 2017	0.218	Feb 2018	0.260	Nov 2018	-		0.260	Continuing	Continuing	Continuing
Systems Engineering	WR	NRL : Washington, DC	2.180	0.687	Nov 2016	0.217	Feb 2018	0.258	Oct 2018	-		0.258	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC/CR : Crane, IN	3.577	0.951	Nov 2016	0.622	Feb 2018	0.741	Oct 2018	-		0.741	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC/DD : Dahlgren, VA	8.334	2.410	Dec 2016	1.994	Jan 2018	2.375	Oct 2018	-		2.375	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC/PHD : Port Hueneme, CA	2.538	0.651	Nov 2016	0.030	Feb 2018	0.037	Oct 2018	-		0.037	Continuing	Continuing	Continuing
Systems Engineering	C/CPIF	SPA (Bridge) : Washington, DC	5.329	0.823	Dec 2016	0.000		0.000		-		0.000	0.000	6.152	-
Systems Engineering	MIPR	ARL : Adelphi, MD	0.678	0.203	Nov 2016	0.223	Feb 2018	0.247	Nov 2018	-		0.247	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC/CD : Carderock, MD	0.280	0.000		0.000		0.000		-		0.000	0.000	0.280	-
Systems Engineering	WR	NSWC/Corona : Corona, CA	0.412	0.084	May 2017	0.000		0.000		-		0.000	0.000	0.496	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	**Project (Number/Name)** 3186 / *Air and Missile Defense Radar*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	Allot	DISA : Scott AFB, Illinois	0.008	0.004	Nov 2016	0.011	Oct 2017	0.011	Nov 2018	-		0.011	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC IH : Indian Head, MD	0.666	0.000		0.000		0.000		-		0.000	0.000	0.666	-
Systems Engineering	SS/FFP	Northrop Grumman : Baltimore, MD	0.065	0.335	Apr 2017	0.233	Feb 2018	0.000		-		0.000	0.000	0.633	-
Systems Engineering	C/FFP	DRS Power & Control Technologies, Inc. : Milwaukee, WI	0.213	0.000		0.000		0.000		-		0.000	0.000	0.213	-
Systems Engineering	C/CPIF	SPA : Washington, DC	0.000	0.319	Aug 2017	0.752	Mar 2018	0.895	Nov 2018	-		0.895	Continuing	Continuing	Continuing
Systems Engineering	C/CPIF	AEGIS TECHREP : Moorestown, NJ	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	38.717	11.666		6.155		7.039		-		7.039	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.773	0.458	Feb 2017	0.000		0.000		-		0.000	0.000	1.231	-
Test and Evaluation	MIPR	GTRI : Atlanta, GA	0.000	0.197	Aug 2017	0.000		0.000		-		0.000	0.000	0.197	-
Test and Evaluation	SS/CPFF	JHU/APL : Laurel, MD	10.402	7.259	Dec 2016	0.000		0.000		-		0.000	0.000	17.661	-
Test and Evaluation	MIPR	MIT : Cambridge, MD	0.254	0.056	Mar 2017	0.000		0.000		-		0.000	0.000	0.310	-
Test and Evaluation	WR	NAWC WD : Pt. Mugu, CA	2.363	3.072	Feb 2017	0.000		0.000		-		0.000	0.000	5.435	-
Test and Evaluation	WR	NRL : Washington, DC	0.991	1.105	Nov 2016	0.418	Feb 2018	0.000		-		0.000	0.000	2.514	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	Project (Number/Name) 3186 / *Air and Missile Defense Radar*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NSWC/DD : Dahlgren, VA	3.043	2.405	Dec 2016	0.112	Jan 2018	0.000		-		0.000	0.000	5.560	-
Test and Evaluation	WR	NSWC/PHD : Port Hueneme, CA	4.090	1.601	Nov 2016	0.428	Feb 2018	0.000		-		0.000	0.000	6.119	-
Test and Evaluation	WR	PMRF : Kekaha, HI	2.180	8.574	Nov 2016	2.039	Feb 2018	0.000		-		0.000	0.000	12.793	-
Test and Evaluation	C/CPIF	SPA (Bridge) : Washington, DC	2.238	0.805	Dec 2016	0.000		0.000		-		0.000	0.000	3.043	-
Test and Evaluation	WR	NSWC/PHD WS : Port Hueneme, CA	61.080	24.330	Nov 2016	0.000		0.000		-		0.000	0.000	85.410	-
Test and Evaluation	WR	NSWC Corona : Corona, CA	4.158	0.452	Jan 2017	0.043	Feb 2018	0.000		-		0.000	0.000	4.653	-
Test and Evaluation	WR	CNA-ONR : Arlington, VA	0.108	0.056	Mar 2017	0.000		0.000		-		0.000	0.000	0.164	-
Test and Evaluation	C/BA	MDA : Redstone Arsenal, AL	0.087	1.108	Jan 2017	0.000		0.000		-		0.000	0.000	1.195	-
Test and Evaluation	C/CPIF	Engility : Andover, MA	0.102	0.331	Dec 2016	0.095	Feb 2018	0.000		-		0.000	0.000	0.528	-
Test and Evaluation	MIPR	DOI : Boise, ID	0.076	1.607	Feb 2017	0.000		0.000		-		0.000	0.000	1.683	-
Test and Evaluation	WR	NSWC Crane : Crane, IN	0.621	0.063	Nov 2016	0.000		0.000		-		0.000	0.000	0.684	-
Test and Evaluation	MIPR	AFSEO : Eglin AFB, FL	0.005	0.006	Mar 2017	0.000		0.000		-		0.000	0.000	0.011	-
Test and Evaluation	WR	FRCE - PMA 226 : Cherry Point, NC	0.005	0.000		0.000		0.000		-		0.000	0.000	0.005	-
Test and Evaluation	WR	NUWC KP : Keyport, WA	0.124	0.242	Nov 2016	0.137	Feb 2018	0.000		-		0.000	0.000	0.503	-
Test and Evaluation	MIPR	Air National Guard : Tulsa, OK	0.000	0.039	Jul 2017	0.000		0.000		-		0.000	0.000	0.039	-
Test and Evaluation	WR	COMNAVAIRPAC : San Diego, CA	0.000	0.069	Feb 2017	0.000		0.000		-		0.000	0.000	0.069	-
Test and Evaluation	WR	NSWC CD : Carderock, MD	0.000	0.792	Jan 2017	0.000		0.000		-		0.000	0.000	0.792	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	Project (Number/Name) 3186 / *Air and Missile Defense Radar*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	AFRL : Kirtland AFB, NM	0.000	0.152	Mar 2017	0.000		0.000		-		0.000	0.000	0.152	-
Test and Evaluation	C/CPIF	SPA : Washington, DC	0.000	0.194	Aug 2017	0.105	Mar 2018	0.000		-		0.000	0.000	0.299	-
		Subtotal	92.700	54.973		3.377		0.000		-		0.000	0.000	151.050	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Management Services	C/CPIF	SPA (Bridge) : Washington, DC	3.514	1.606	Dec 2016	0.000		0.000		-		0.000	0.000	5.120	-
Travel	Sub Allot	PEOIWS2 : Washington, DC	0.331	0.205	Apr 2017	0.150	Mar 2018	0.075	Jan 2019	-		0.075	Continuing	Continuing	Continuing
Support Management Services	WR	NSWC/DD : Dahlgren, VA	1.589	0.479	Dec 2016	0.070	Jan 2018	0.082	Oct 2018	-		0.082	Continuing	Continuing	Continuing
Support Management Services	C/CPFF	TMB-PSS : Washington, DC	0.037	0.219	Dec 2016	0.053	Oct 2017	0.054	Dec 2018	-		0.054	Continuing	Continuing	Continuing
Support Management Services	C/CPFF	CACI-PSS : Washington, DC	0.603	0.131	Apr 2017	0.088	Dec 2017	0.090	Dec 2018	-		0.090	Continuing	Continuing	Continuing
Support Management Services	C/CPFF	STRATEGIC INSIGHT : Arlington, VA	0.111	0.000		0.035	Jan 2018	0.036	Dec 2018	-		0.036	Continuing	Continuing	Continuing
Support Management Services	C/CPIF	UNC : Chapel Hill, NC	0.098	0.000		0.000		0.000		-		0.000	0.000	0.098	-
Support Management Services	WR	NSWC/CD : Carderock, MD	0.000	0.077	Jul 2017	0.035	Feb 2018	0.000		-		0.000	0.000	0.112	-
Support Management Services	C/CPIF	SPA : Washington, DC	0.000	0.430	Aug 2017	0.830	Mar 2018	0.853	Nov 2018	-		0.853	Continuing	Continuing	Continuing
		Subtotal	6.283	3.147		1.261		1.190		-		1.190	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	Project (Number/Name) 3186 / *Air and Missile Defense Radar*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	353.387	141.338		32.090		27.059		-		27.059	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	**Project (Number/Name)** 3186 / *Air and Missile Defense Radar*

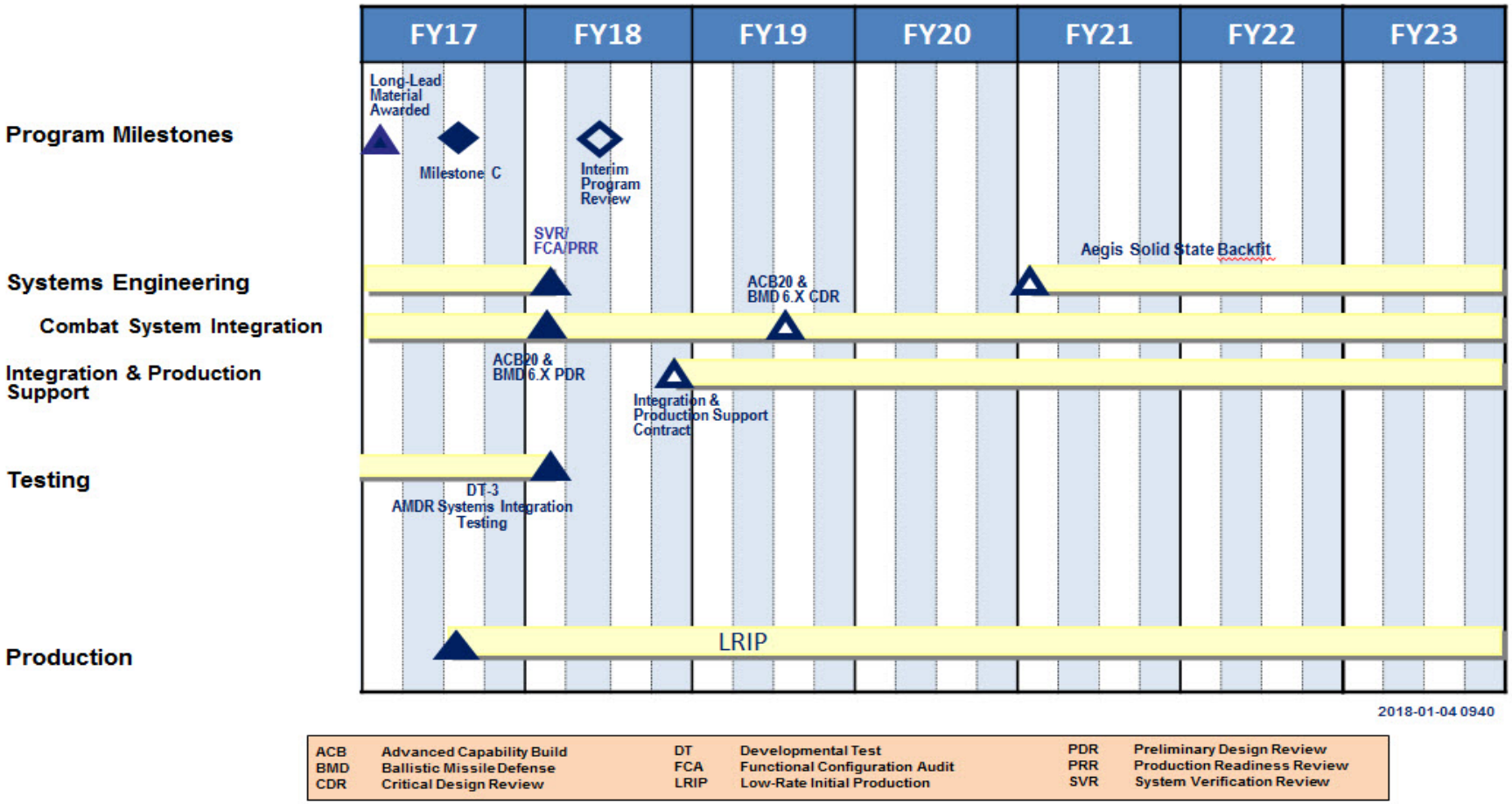


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604522N / *(U)Air and Missile Defense Radar (AMDR) System*	**Project (Number/Name)** 3186 / *Air and Missile Defense Radar*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3186				
E&MD AMDR System Integration Testing (DT-3)	1	2017	1	2018
LRIP Long Lead Material Award	1	2017	1	2017
Milestone C	3	2017	3	2017
System Verification Review/Functional Configuration Audit/Production Readiness Review	1	2018	1	2018
ACB 20 and BMD 6.X PDR	1	2018	1	2018
Interim Program Review	2	2018	2	2018
Integration and Production Support Contract	4	2018	4	2023
ACB 20 and BMD 6.X CDR	3	2019	3	2019
Aegis Solid State Backfit	1	2021	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604530N *I (U)Advanced Arresting Gear (AAG)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	0.000	184.106	-	184.106	147.435	93.491	22.588	0.762	0.000	448.382
2367: *Advanced Arresting Gear*	0.000	0.000	0.000	184.106	-	184.106	147.435	93.491	22.588	0.762	0.000	448.382
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 529												

Note

FY18 and prior year funding for Advanced Arresting Gear (AAG) is funded under Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recover project unit 2232. All Prior Years RDTEN funding for the program is $711.700M; FY17 is $100.402M; and FY18 is $170.526M.

A. Mission Description and Budget Item Justification

The Advanced Arresting Gear (AAG) program designs, develops, tests and fields an aircraft arrestment system to replace the legacy Mark 7 arresting gear. AAG systems will be installed on all new construction aircraft carriers. AAG will provide the U.S. Navy with improved operational capability, while reducing operating and support costs. The AAG system will recover all existing and projected carrier based tail hook-equipped air vehicles well into the 21st century.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	184.106	-	184.106
Total Adjustments	0.000	0.000	184.106	-	184.106
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	186.357	-	186.357
• Rate/Misc Adjustments	0.000	0.000	-2.251	-	-2.251

Change Summary Explanation

Technical: AAG established in its own Program Element and Project Unit in FY19 and out.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604530N *I (U)Advanced Arresting Gear (AAG)*

Cost: FY19 in the previous President's budget submission was $194.457M. Decrease in FY19 (-$8.1M) resulting in $186.272M is due to ARBs no longer required as a result of DoN decision to divest of legacy Hornets F/A-18A-D.

R-2 Program Change Summary in PE 0604512N Shipboard Aviation Systems shows the AAG funding profile transferred out as a program adjustment ($-194.457M). This R2 exhibit's Program Change Summary displays the net program adjustment in (+$186.357M) after the $8.1M reduction.

Schedule: Schedule updated to support the additional funding added in FY18 and out for Life Cycle Support items such as Software Support Activity (SSA), Depot Planning and the development of a permanent training solution.

Milestone C moved from 4Q FY 2020 to 4Q FY 2021.
Test & Evaluation Jet Car Test Site (JCTS) Test End Date moved from 2Q FY2019 to 4Q FY2020
Test & Evaluation for Runway Arrested landing Site (RALS) Test Start Date moved from 2Q FY2016 to 1Q FY 2017
Test & Evaluation for Runway Arrested landing Site (RALS) Test End Date moved from 1Q FY2020 to 1Q FY2022.
Schoolhouse Training Curriculum Development moved from 1Q FY2019 to 4Q FY2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	Project (Number/Name) 2367 / *Advanced Arresting Gear*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2367: *Advanced Arresting Gear*	0.000	0.000	0.000	184.106	-	184.106	147.435	93.491	22.588	0.762	0.000	448.382
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 529

Note

Advanced Arresting Gear (AAG) was previously funded under Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recovery project unit 2232 in FY 2018 and prior.

A. Mission Description and Budget Item Justification

The Advanced Arresting Gear (AAG) program will design, develop, test and field an aircraft arrestment system to replace the legacy Mark 7 arresting gear. AAG systems will be installed on all new construction aircraft carriers. AAG will provide the U.S. Navy with improved operational capability, while reducing operating and support costs. The AAG system will recover all existing and projected carrier based tail hook-equipped air vehicles well into the 21st century.

The AAG Program's SDD phase test article consists of a single wire configured aircraft arresting system, which includes associated hardware and software needed to conduct system integrated testing by arresting both dead-loads and aircraft.

The increase from $0M in FY18 to $184.1M in FY19 is a direct result of Advanced Arresting Gear (AAG) program moving PE 0604512N PU 2232 to PE 0604530N PU 2367. The overall $13.6M increase from FY 2018 $170.5M (in the Shipboard Aviation Systems program element 0604512N) to FY 2019 $184.1M is part of the effort to fund AAG to the Nunn-McCurdy cost estimate. This increase provides support for Primary HW Development efforts, AAG Test & Evaluation efforts, Depot Planning efforts, Software Support Activity and Training efforts that were not previously fully funded under the ACAT designation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Advanced Arresting Gear (AAG) Primary Hardware Development	0.000	0.000	92.382	0.000	92.382
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Continue AAG System Development and Demonstration including hardware and software analysis and design efforts for system controls, electrical and mechanical components to meet the requirements of the AAG performance specification. Complete developmental component, environmental and shock qualification testing. Complete developmental efforts including deadload and aircraft recoveries required to issue the CVN 78 Post					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	**Project (Number/Name)** 2367 / *Advanced Arresting Gear*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Shakedown Availability (PSA) Aircraft Recovery Bulletins (ARB). Complete requirements verification efforts necessary to certify the AAG System. Initiate High Cycle verification testing. Continue the development of AAG logistics products including the Final Interactive Electronic Technical Manual In Process Review and issuance. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase in FY 2018 to FY 2019 is due to the Advanced Arresting Gear (AAG) program moving from Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recover project unit 2232 to program element 0604530N, project unit 2367.					
Title: Advanced Arresting Gear Test & Evaluation	0.000	0.000	50.116	0.000	50.116
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Perform Integrated Test and Evaluation (IT&E) for AAG barricade testing, T-45 Aircraft Compatibility Testing, full AAG Envelope Testing and Reliability Growth Testing. Develop IT&E test plans, procure hardware to support barricade testing. Initiate barricade testing at the Jet Car Track Site (JCTS) for the issuance of the barricade Aircraft Recovery Bulletin (ARB) in FY20. Initiate Dynamic Control System (DCS) software development tests in support of T-45 and Full Envelope testing. Initiate the installation of T-45 aircraft test instrumentation in preparation for manned aircraft arrestment testing at the Runway Arrested Landing Site (RALS). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase in FY 2018 to FY 2019 is due to the Advanced Arresting Gear (AAG) program moving from Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recover project unit 2232 to program element 0604530N, project unit 2367.					
Title: Advanced Arresting Gear Depot Planning	0.000	0.000	14.229	0.000	14.229
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	**Project (Number/Name)** 2367 / *Advanced Arresting Gear*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 Base Plans:*** Begin the development of the required processes and procedures to plan for Depot level activities (i.e. Depot Interactive Electronic Technical Manuals (IETM) and Depot Task Analysis). Initiate the planning and analysis necessary to standup AAG Depot Level maintenance, overhaul and repair facility/facilities for AAG components. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase in FY 2018 to FY 2019 is due to the Advanced Arresting Gear (AAG) program moving from Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recover project unit 2232 to program element 0604530N, project unit 2367.					
Title: Advanced Arresting Gear Software Support Activity (SSA)	0.000	0.000	11.468	0.000	11.468
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Initiate the establishment of an Organic Software Support Activity (SSA) for modifications to the system's software following initial fielding. Initiate the design and development of laboratory hardware necessary to establish an organic software development and test capability. Begin the development of organic software development, test, release and quality assurance processes. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase in FY 2018 to FY 2019 is due to the Advanced Arresting Gear (AAG) program moving from Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recover project unit 2232 to program element 0604530N, project unit 2367.					
Title: Advanced Arresting Gear Training	0.000	0.000	15.911	0.000	15.911
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	**Project (Number/Name)** 2367 / *Advanced Arresting Gear*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 Base Plans:*** Continue the Formal Training Course Development. Begin the development of the AAG Multipurpose Reconfigurable Training System (MRTS) necessary for the Center for Naval Aviation Technical Training (CNATT) to declare Ready For Training (RFT) in FY22. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase in FY 2018 to FY 2019 is due to the Advanced Arresting Gear (AAG) program moving from Shipboard Aviation Systems program element 0604512N, CV/CVN Launch and Recover project unit 2232 to program element 0604530N, project unit 2367.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	184.106	0.000	184.106

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/4217: *Advanced Arresting Gear (AAG)*	0.000	10.900	11.054	-	11.054	4.723	3.137	2.460	2.513	263.910	298.697
• OPN/4213: *Aircraft Launch & Recovery Equipment*	81.428	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• SCN/2001: *Carrier Replacement Program*	2,626.567	4,461.772	1,598.181	-	1,598.181	2,146.535	3,239.606	2,910.491	3,378.355	10,602.689	52,295.070

Remarks

OPN 4213 includes a portion of line item funding for Aircraft Launch & Recovery Equipment in FY17 and prior.

D. Acquisition Strategy

The Navy competitively awarded two Cost Plus Fixed Fee Technical Development phase contracts to develop the Advanced Arresting Gear (AAG) system. Upon completion of the Preliminary Design and Integrated Baseline reviews, the Navy awarded a single Cost Plus Award Fee option to General Atomics for the System Development and Demonstration (SDD) phase to develop and demonstrate a production representative AAG at the NAVAIR Lakehurst Jet Car Track Site and Runway Arrested Landing Site. Continuing development on the SDD contract awarded in 2004.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	**Project (Number/Name)** 2367 / *Advanced Arresting Gear*

E. Performance Metrics

Will complete System Development and Demonstration integrated testing at Jet Car Track Site and Runway Arrested Landing Site. AAG will demonstrate its key performance parameters and readiness for operational test.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	Project (Number/Name) 2367 / *Advanced Arresting Gear*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Development	C/CPAF	General Atomics : San Diego, CA	0.000	0.000		0.000		72.528	Nov 2018	-		72.528	108.119	180.647	180.647
Primary HW Development	C/CPAF	ESL : Cranston, RI	0.000	0.000		0.000		2.714	Dec 2018	-		2.714	0.000	2.714	2.714
Primary HW Development	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		38.848	Nov 2018	-		38.848	28.844	67.692	-
Systems Engineering	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		6.995	Nov 2018	-		6.995	4.884	11.879	-
Training Development	TBD	TBD : TBD	0.000	0.000		0.000		13.359	Nov 2018	-		13.359	11.395	24.754	-
		Subtotal	0.000	0.000		0.000		134.444		-		134.444	153.242	287.686	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		4.483	Nov 2018	-		4.483	2.234	6.717	-
Government Engineering Support	WR	Various : Various	0.000	0.000		0.000		0.425	Nov 2018	-		0.425	1.380	1.805	-
Training Support	WR	NAWCAD : Orlando, FL	0.000	0.000		0.000		2.552	Nov 2018	-		2.552	2.749	5.301	-
Software Development	TBD	General Atomics : San Diego, CA	0.000	0.000		0.000		9.174	Nov 2018	-		9.174	12.683	21.857	21.857
Government Engineering Support	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		5.851	Nov 2018	-		5.851	19.243	25.094	-
Depot Planning	TBD	General Atomics : San Diego, CA	0.000	0.000		0.000		10.672	Nov 2018	-		10.672	17.685	28.357	28.357
		Subtotal	0.000	0.000		0.000		33.157		-		33.157	55.974	89.131	N/A

Remarks

The increase in support costs from FY2018 to FY2019 is to provide for the Training System Development, Depot Planning and Software Support Activity (SSA) Standup as well as government engineering support at Lakehurst, NJ that will provide the logistics support for the Depot Planning and SSA Standup.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	Project (Number/Name) 2367 / *Advanced Arresting Gear*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental T&E	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		15.717	Nov 2018	-		15.717	53.156	68.873	-
Operational T&E	WR	Various : Various	0.000	0.000		0.000		0.312	Nov 2018	-		0.312	0.723	1.035	-
		Subtotal	0.000	0.000		0.000		16.029		-		16.029	53.879	69.908	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Mgmt Support	C/CPFF	Sierra Management & Technologies : California, MD	0.000	0.000		0.000		0.306	Nov 2018	-		0.306	0.767	1.073	1.073
Travel	Various	Various : Various	0.000	0.000		0.000		0.042	Oct 2018	-		0.042	0.096	0.138	-
Program Management Support	WR	Various : Various	0.000	0.000		0.000		0.128	Nov 2018	-		0.128	0.318	0.446	-
		Subtotal	0.000	0.000		0.000		0.476		-		0.476	1.181	1.657	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		184.106		-		184.106	264.276	448.382	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	**Project (Number/Name)** 2367 / *Advanced Arresting Gear*

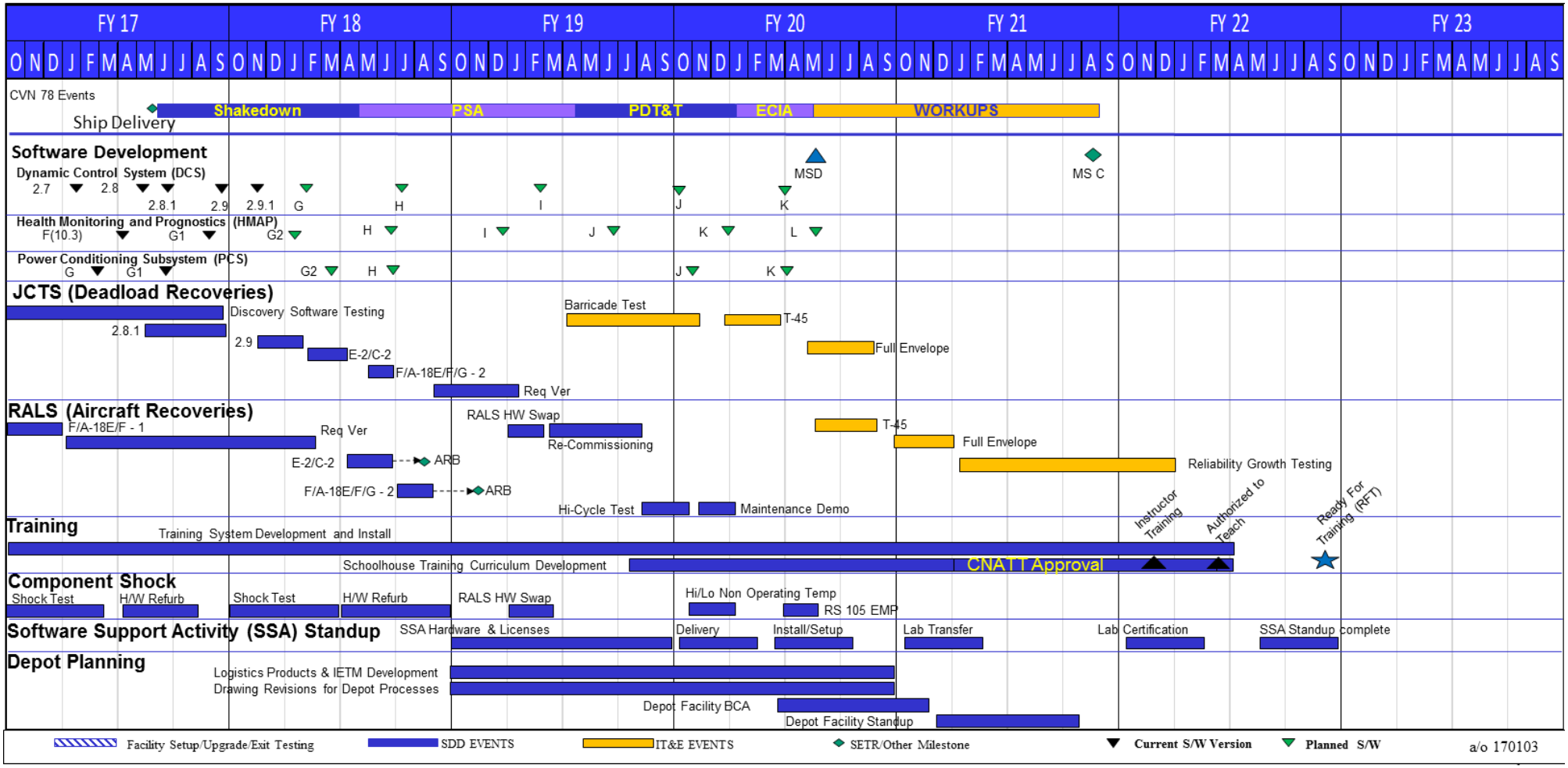


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604530N / *(U)Advanced Arresting Gear (AAG)*	**Project (Number/Name)** 2367 / *Advanced Arresting Gear*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADVANCED ARRESTING GEAR (AAG)				
Acquiisition Milestones: Milestones: Milestone C	4	2021	4	2021
Test & Evaluation: Technical Evaluation: Jet Car Test Site (JCTS) Test	1	2017	4	2020
Test & Evaluation: Technical Evaluation: Runway Arrested Landing Site Test (RALS)	1	2017	1	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604558N *I New Design SSN*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	2,432.992	127.883	120.087	148.233	-	148.233	118.539	194.800	232.977	277.239	Continuing	Continuing
1947: *New Design SSN HM&E*	1,476.511	83.732	82.506	104.968	-	104.968	78.062	155.449	192.807	236.241	Continuing	Continuing
1950: *New Design SSN Combat Sys Dev*	890.090	25.285	34.913	40.604	-	40.604	37.757	36.568	37.327	38.097	Continuing	Continuing
3062: *Submarine Multi-Mission Team Trainer*	39.817	2.425	2.668	2.661	-	2.661	2.720	2.783	2.843	2.901	Continuing	Continuing
9999: *Congressional Adds*	26.574	16.441	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	43.015

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 516

A. Mission Description and Budget Item Justification

The U.S. Navy must maintain a submarine fleet that is of sufficient capability and numbers to defend American interests. The VIRGINIA Class Submarine, formerly the New Attack Submarine (New SSN), is being designed to fulfill this need. It will counter the potential threats of the next century in a multi- mission capable submarine that has the ability to provide covert, sustained combat presence in denied waters. The primary goal of the program is to develop an affordable yet capable submarine by evaluating a broad range of system and technology alternatives, and pursuing cost reduction, producibility improvement, and technical risk management. This Program Element (PE) provides the technology, prototype components, and systems engineering needed to design and construct the VIRGINIA Class Submarine and build its Command, Control, Communications, and Intelligence (C3I) System. This PE directly supports the following VIRGINIA Class Submarine missions: (1) covert strike warfare (STRIKE); (2) anti-submarine warfare (ASW); (3) covert intelligence collection/surveillance (ISR), indication and warning (I&W), and electronic warfare (EW); (4) anti-surface ship warfare (ASUW); (5) special warfare; (6) covert mine warfare; and (7) battle group support.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	113.013	120.087	100.116	-	100.116
Current President's Budget	127.883	120.087	148.233	-	148.233
Total Adjustments	14.870	0.000	48.117	-	48.117
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.921	0.000			
• SBIR/STTR Transfer	-4.049	0.000			
• Program Adjustments	0.000	0.000	49.242	-	49.242

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy				Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		**R-1 Program Element (Number/Name)** PE 0604558N *I New Design SSN*			
• Rate/Misc Adjustments	0.000	0.000	-1.125	-	-1.125
• Congressional General Reductions Adjustments	-0.002	-	-	-	-
• Congressional Add Adjustments	17.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Program Increase*	6.770	0.000
Congressional Add: *Small Business Technology Insertion*	9.671	0.000
Congressional Add Subtotals for Project: 9999	16.441	0.000
Congressional Add Totals for all Projects	16.441	0.000

Change Summary Explanation

The FY 2019 funding request was reduced by $0.858 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

The FY 2017 increase for congressional add for Small Business Tech Insertion and Program Increase for Electronic Warfare Enhancements.

The FY 2017 congressional reduction was for SBIR.

The FY 2017 Program Adjustment for FY 18 Rim of the Pacific Exercise(RIMPAC) Engineering Civic Action Program (ENCAP) Demonstration Launch

The FY2019 Program Adjustment is due to an addition of funding to support the following efforts - development of the VIRGINIA Class (VCS) Stern Area System, Special Operation Force capability enhancements, and execution of the Tactical Submarine Evolution Plan (TSEP). TSEP is the Undersea Enterprises' holistic plan to maintain the right mix of SSN, SSGN, SSBN, and next SSN platforms to meet current and future requirements for Undersea Warfare. TSEP is a scalable, enduring process for developing and fielding undersea capabilities while continually ensuring alignment with the strategic guidance outlined in strategic documents, to include National Security Strategy, National Military Strategy, and Navy's Design for Maintaining Maritime Superiority. TSEP will procure the right mix of tactical platforms with the right capabilities in a manner and schedule to foster and maintain an efficient, cost effective production infrastructure. TSEP looks at a near-term (10 year) and a long-term window of at least 50 year to build, train, and equip the submarine force of the future to maintain undersea dominance. TSEP sustains and enhances current VCS submarines being built (BLK V-VII) and prepares for the next generation submarine force through the deliberate process of developing targeted time/phased solutions across complex parallel efforts - delivering the right platform with the right capabilities at the right time to ensure we can outperform the adversary today, tomorrow, and well into the future. (Capabilities are classified and available upon request)

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*				Project (Number/Name) 1947 / *New Design SSN HM&E*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
1947: *New Design SSN HM&E*	1,476.511	83.732	82.506	104.968	-	104.968	78.062	155.449	192.807	236.241	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 516

A. Mission Description and Budget Item Justification

This project encompasses all the ship system development efforts for the VIRGINIA Class Submarine and the Technology Insertion Program for reducing costs and upgrading
performance of future hulls by virtue of improvements in ship systems. Technology development implementation and logistics for developmental items, and VIRGINIA Class test
& evaluation are included. The thrust of these efforts will be to develop and apply multiple advanced system technologies which are integrated into the design of the VIRGINIA
Class Submarine. Technologies developed in this program will be considered for applicability to the COLUMBIA Program (CLB) for commonality opportunities. New technologies
are being transitioned from industry and government research and development programs where doing so offers substantial performance improvement and/or affordability payoffs.
Transition opportunities include those from the Defense Advanced Research Projects Agency (DARPA) Sensors & Payloads program and Office of Naval Research (ONR) Future Naval
Capabilities Program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: New Design SSN HM&E	76.911	78.435	100.897	0.000	100.897
Articles:	-	-	-	-	-
FY 2018 Plans: Complete procurement of subsystem components in support of SDIP installation. Complete detailed availability planning for the Post Shakedown Availability (PSA) installation of SDIP changes. Complete planning and design necessary for SDIP technologies insertion into the VIRGINIA Class baseline for new construction hulls. Continue development of HM&E systems concepts, technologies and obsolescence redesign for integration into VIRGINIA Class Block V Technical Baseline. Complete initial efforts and initiate new engineering efforts for advanced payloads. Continue transition of products from the Office of Naval Research Manufacturing Technology Program (MANTECH). Continue the transition of products from ONR FNC Program.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1947 / *New Design SSN HM&E*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Commence PSA and begin installation of SDIP components and modifications. Further develop design details for SDIP Technologies' insertion into the VIRGINIA Class baseline for Block V. Continue development of HM&E systems concepts, technologies including obsolescence redesign for integration into VIRGINIA Class Block V Technical Baseline. Continue initial efforts and initiate new engineering efforts based on OPNAV direction for integrating advanced payload systems into VIRGINIA Class platforms. Expand the scope of these efforts to include various options for leveraging increased vertical payload volume commensurate with insertion of VPM into Block V and other concepts beyond Block V for host ship interaction with large volume UUVs. Initiate development of possible design options to support the Tactical Submarine Evolution Plan (TSEP). Continue transition of products from the Office of Naval Research Manufacturing Technology Program (MANTECH). Continue the transition of products from the ONR FNC Program. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase due to the addition of Tactical Submarine Evolution Plan (TSEP) details are classified and available upon request.					
Title: TEST AND EVALUATION	6.821	4.071	4.071	0.000	4.071
Articles:	-	-	-	-	-
FY 2018 Plans: Continue work associated with previous test events (IOT&E, Arctic, Low Frequency Active, Dry-Deck Shelter) and commence work on Block III FOT&E results when available. This consists mainly of documenting and testing fixes to deficiencies identified by COTF as well as addressing recommendations noted by the Oversight Community from OSD. Conduct the Maximum Missile Spin-Up to close out Block III FOT&E. Complete all post-test evaluation and publish required reports, prior to the first Block III submarine commencing deployed operations. Complete development of the Block V TEMP (TEMP 1425 Rev H) and submit for signature. Continue development of the test plan to support the Acoustic Superiority initiative developed by the OPNAV Sponsor. Commence initial efforts to develop FOT&E plan, to include the Cybersecurity test strategy, for Block V. Develop of the Susceptibility Assessment Plan, along with an update to the program's Vulnerability Assessment Report, to meet the LFT&E legislation set out in Title 10 USC 2366. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1947 / *New Design SSN HM&E*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue work associated with previous test events (IOT&E, Arctic, Low Frequency Active, Dry-Deck Shelter, Block III FOT&E). This consists mainly of documenting and testing fixes to deficiencies identified by COTF as well as addressing recommendations noted by the Oversight Community from OSD. Continue efforts to develop FOT&E plan, to include the Cybersecurity test strategy, for Block V. The Cybersecurity test strategy will be planned and executed in coordination with the USS COLUMBIA Class IOT&E Cybersecurity test strategy. Complete development, and commence execution, of the test plan to support the Acoustic Superiority initiative developed by the OPNAV Sponsor. Continue the development of the Susceptibility Assessment Plan and Vulnerability Assessment Report to meet the LFT&E legislation set out in Title 10 USC 2366. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY18 to FY19.					
Accomplishments/Planned Programs Subtotals	83.732	82.506	104.968	0.000	104.968

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/2013: *Virginia Class Submarine*	5,040.219	5,225.911	7,169.783	-	7,169.783	7,150.388	6,475.968	6,004.291	6,126.497	40,799.161	150,316.746
• OMN/0204283N: *Sub Ops & Safety*	22.984	25.247	26.606	-	26.606	27.164	27.900	28.459	0.000	Continuing	Continuing
• OPN/0942: *Virginia Class Support Equipment*	63.908	46.610	66.328	-	66.328	28.465	23.263	22.910	23.326	Continuing	Continuing
• RDTEN/0604580N: *(U)Virginia Payload Module (VPM)*	94.846	72.861	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.380

Remarks

D. Acquisition Strategy

The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach has facilitated a smoother transition from design to manufacturing and has reduced the number of changes typically encountered during construction of the lead and early follow-on ships. In September 1997, Congress passed a law allowing General Dynamics Electric Boat (GDEB) and Northrop Grumman Newport News (NGNN), now Huntington Ingalls Industries - Newport News Shipbuilding (HII-NNS), to

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1947 / *New Design SSN HM&E*

team for production of the first four VIRGINIA Class Submarines. Under the teaming agreement, GDEB remained the design yard for the VIRGINIA Class Submarine and HII-NNS became a part of the IPPD process. The Program Office is managing two Multi-Year Procurement (MYP) contracts. The first is for the Block III (FY09-13) ships. The second is for the Block IV (FY14-18) ships awarded April 2014. All Block I & II ships (SSNs 774-783) have been delivered. The first four Block III ships, SSN 784 SSN 785, SSN 786 and SSN 787, delivered in August 2014, June 2015, August 2016 and May 2017 respectively, with the remaining four ships awarded and under construction. The first eight Block IV ships are awarded and under construction, with the remaining two to be authorized and appropriated in FY 2018. The program is currently planning for the fourth MYP (Block V) contract that will reflect 10 SSNs (FY19-23) and is anticipated to award in Early FY 2019.

E. Performance Metrics

Successful completion of Final Operational Test and Evaluation (FOT&E) for Block III modifications. SDIP design completion.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*	Project (Number/Name) 1947 / *New Design SSN HM&E*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Development	WR	NSWC : Carderock, MD	252.629	6.000	Nov 2016	5.960	Nov 2017	8.318	Nov 2018	-		8.318	Continuing	Continuing	Continuing
Component Development	WR	NUWC : Newport, RI	115.025	2.840	Nov 2016	1.599	Nov 2017	2.237	Nov 2018	-		2.237	Continuing	Continuing	Continuing
Component Development	WR	NRL : Washington, DC	8.300	0.230	Nov 2016	0.370	Nov 2017	0.516	Nov 2018	-		0.516	Continuing	Continuing	Continuing
Component Development	C/CPFF	Electric Boat : Groton, CT	784.156	67.841	Nov 2016	68.201	Nov 2017	87.117	Nov 2018	-		87.117	Continuing	Continuing	Continuing
Component Development	SS/CPFF	Applied Research Laboratory : Penn State University	24.188	0.000		1.085	Dec 2017	1.520	Dec 2018	-		1.520	Continuing	Continuing	Continuing
Component Development	SS/FP	National Shipbuilding Research Program : Not Specified	4.739	0.000		0.500	Mar 2018	0.500	Mar 2019	-		0.500	Continuing	Continuing	Continuing
Component Development	Various	Miscellaneous : Not Specified	23.951	0.000		0.720	Dec 2017	0.689	Dec 2018	-		0.689	Continuing	Continuing	Continuing
		Subtotal	1,212.988	76.911		78.435		100.897		-		100.897	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation - DT&E	WR	NSWC : Carderock, MD	93.018	0.190	Nov 2016	0.153	Nov 2017	0.248	Nov 2018	-		0.248	Continuing	Continuing	Continuing
Test and Evaluation - LFT&E	WR	NSWC : Carderock, MD	3.897	0.850	Nov 2016	0.530	Nov 2017	0.530	Nov 2018	-		0.530	1.700	7.507	-
Test and Evaluation - DT&E	WR	NUWC : Newport, RI	137.355	0.300	Nov 2016	0.502	Nov 2017	0.501	Dec 2018	-		0.501	Continuing	Continuing	Continuing
Test and Evaluation - OT&E	PO	COMOPTEVFOR : Norfolk, VA	17.483	0.690	Nov 2016	0.711	Nov 2017	0.313	Nov 2018	-		0.313	Continuing	Continuing	Continuing
Test and Evaluation - LFT&E	C/CPFF	Electric Boat : Groton, CT	1.870	0.250	Dec 2016	0.250	Dec 2017	0.250	Jan 2019	-		0.250	Continuing	Continuing	Continuing
Test and Evaluation - LFT&E	WR	NUWC : Newport,RI	0.000	0.000		0.125	Nov 2017	0.125	Nov 2018	-		0.125	0.000	0.250	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*	Project (Number/Name) 1947 / *New Design SSN HM&E*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation - RIMPAC OT&E	WR	NUWC : Newport, RI	0.000	2.921	Aug 2017	0.000		0.000		-		0.000	0.000	2.921	-
Test and Evaluation - DT&E	WR	PMA 280 : Pax River, MD	5.738	0.000		0.000		0.000		-		0.000	0.000	5.738	-
Test and Evaluation - DT&E	C/CPFF	NUWC : Newport, RI - CORE Team	4.162	1.620	Dec 2016	1.800	Jan 2018	2.104	Jan 2019	-		2.104	0.000	9.686	-
		Subtotal	263.523	6.821		4.071		4.071		-		4.071	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,476.511	83.732		82.506		104.968		-		104.968	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1947 / *New Design SSN HM&E*

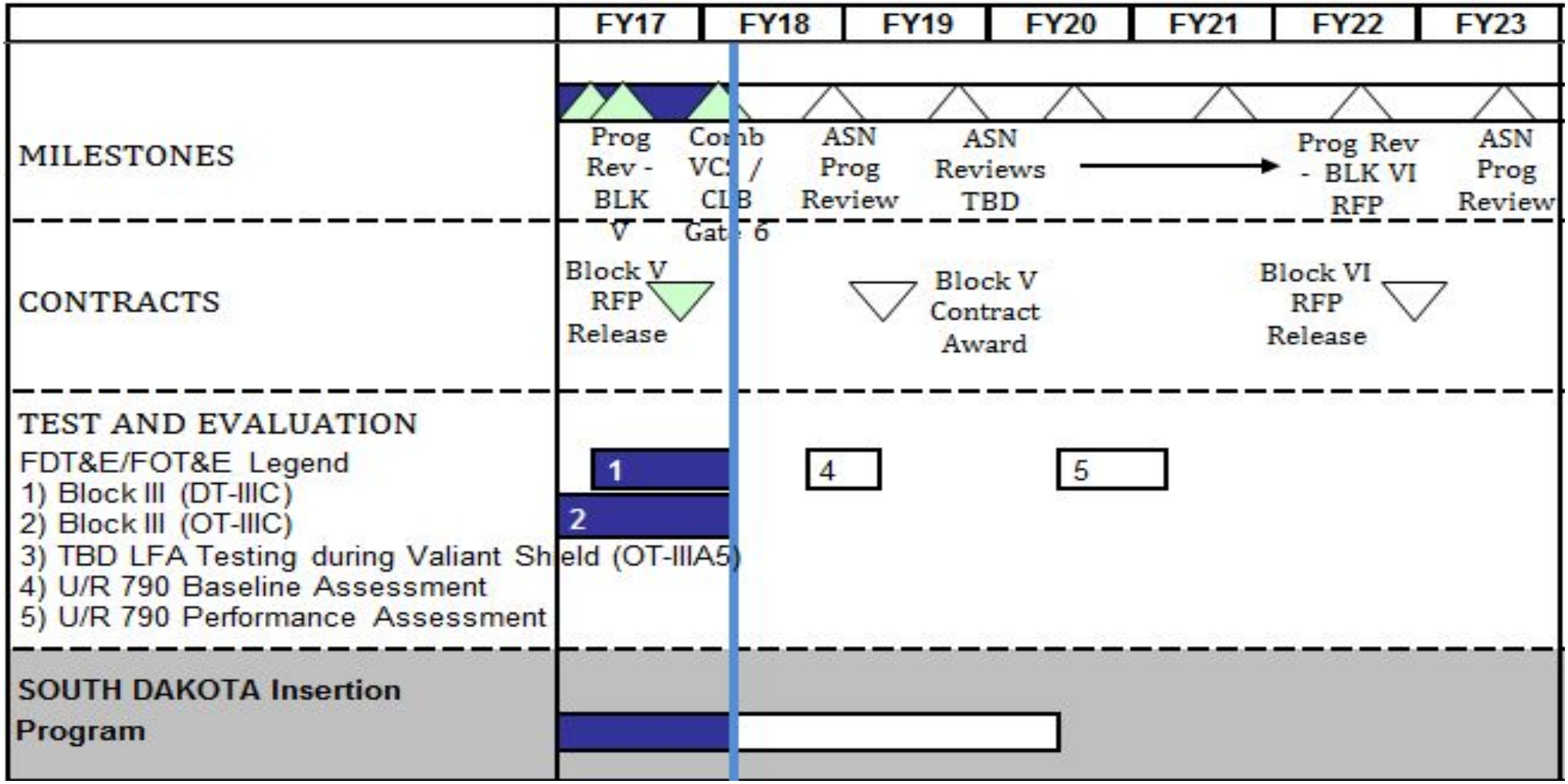


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1947 / *New Design SSN HM&E*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1947				
MILESTONE: Prog Review	1	2017	1	2017
MILESTONE: Acquisition Review - BLK V RFP	2	2017	2	2017
MILESTONE: ASN Reviews (annual) (TBD)	4	2019	4	2023
MILESTONE: Prog Rev BLK VI RFP	3	2022	3	2022
CONTRACTS: Block V RFP Release	4	2017	4	2017
CONTRACTS: Block V Contract Award	1	2019	1	2019
CONTRACTS: Block VI RFP Release	4	2022	4	2022
TEST & EVALUATION: Block III (DT-IIIC)	2	2017	1	2018
TEST & EVALUATION: Block III (OT-IIIC)	1	2017	1	2018
TEST & EVALUATION: U/R 790 Baseline Assessment	2	2018	4	2018
TEST & EVALUATION: U/R 790 Performance Assessment	2	2020	1	2021
SOUTH DAKOTA Improvement Program	1	2017	2	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*	Project (Number/Name) 1950 / *New Design SSN Combat Sys Dev*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1950: *New Design SSN Combat Sys Dev*	890.090	25.285	34.913	40.604	-	40.604	37.757	36.568	37.327	38.097	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 516

A. Mission Description and Budget Item Justification

This project provides the engineering development required to outfit each ship of the VIRGINIA Class Submarine with a combat system which satisfies ORD requirements in all 7 mission areas, namely; ASW, STRIKE, ISR, Covert Mine Warfare, Battle Group Support, ASUW, and Special Warfare. The fully integrated combat system, otherwise referred to as the Non-Propulsion Electronics System (NPES), is composed of a collection of functional sub-systems, such as sonar, navigation, exterior communications, weapons launch, Large Vertical Array, Submarine Warfare Federated Tactical System (SWFTS) virtualization, Electronic Warfare Next Generation Architecture, etc., which evolve over the life of the program due to either competitive selection of new suppliers, component obsolescence replacement, increased technical performance, or improvements in reliability. Non-recurring engineering activity is needed to perform platform integration of the components, software modification to accommodate electronic data exchange, unique submarine environment qualification and update of all logistics products.

JUSTIFICATION: The FY2019 budget request is higher than standard inflation rates due to new design and development activities associated with the Block V technical baseline. These increases reflect the scope of work required to support combat systems changes specifically related to as well as other continuing development efforts:
-Large Vertical Array (LVA) integration on TI-14 SSN790 during PSA to identify design deltas needed for the TI-20 Blk V configured NPES (SSN802 AFS).
-NPES/SWFTS architectural design changes tied to Blk V virtualization of the TI-20 configuration and commonality with Columbia Class lead ship NPES.
-Development of the Ring Laser Gyroscope Navigation (RLGN) system replacement, critical to safety of flight operation and all combat mission areas.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: C3I Systems Engineering	11.343	14.587	16.501	0.000	16.501
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct full-ship integration testing of the SSN792 BPS-17 Radar system dockside. Complete initial SDIP design; specific activities include hardware/software integration, Environmental Qualification Test and System Design Certification Test, Test fixture development, and ILS product development for this equipment. Incorporate Next Generation Architecture-Electronic Warfare System (NGA-EW) functionality into the VA Class obsolete AN/BLQ-10A system. Funds development of the ISR mission dependent efforts required until EW NGA capability re-programmed for BLK V is fielded.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1950 / *New Design SSN Combat Sys Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct TI-16 integration testing of the BPS-17 Radar on SSN796 at COATS. Conduct platform level integration of the Low Profile Photonics Mast dockside on SSN794. Develop and integrate an inertial navigation system replacement to the WSN-7 Ring Laser Gyro-navigator(RLGN). Initiate forward compartment SECRET level wireless Local Area Network (LAN) design. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase due to the development and integration of the RLGN replacement.					
Title: Sonar, Combat Control, and Architecture (S/CC/A) Subsystems	13.942	20.326	24.103	0.000	24.103
Articles:	-	-	-	-	-
Description: Continue development of S/CC/A System Improvements necessary to maintain VIRGINIA Class ORD compliance, counter CYBER threats, and maintain commonality with in-service submarine designs. ***FY 2018 Plans:*** Initiate development and C3I system level integration of the TI16/APB15 configuration slated for hulls 3-6 of the Block IV contract (SSN794-SSN797). Continue development of the first NPES/SWFTS architectural design change since 1996 open systems standardization and program inception. Complete the multi-year migration of the interface software from CORBA to AMQP to mitigate obsolescence. Continue environmental qualification testing of the TI16 pedigree hardware. Continue the development of the tactical architecture which enables virtualization of as many combat system functional components as practical and operationally effective, spanning the TI-18 to TI-24 implementation timeframe. ***FY 2019 Base Plans:*** Initiate TI-20 S/CC/A design, programmed to be the configuration for VCS Blk V and leveraged by the Columbia Class for lead ship. Continue to design virtualization enabling system architectures and bench test technologies which support CYBER defense, increased suitability, rapid modernization, and affordable procurement. Conduct platform level integration testing of SDIP sensor components during PSA. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1950 / *New Design SSN Combat Sys Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase due to the Large Vertical Array integration into TI-14 for SSN790 during Post-Shakedown Availability and Non-Propulsion Electronic System (NPES) SWFTS architectural design changes. This effort supports operational testing of the BLK V TI-20 configuration and commonality with Columbia Class lead ship NPES.					
Accomplishments/Planned Programs Subtotals	25.285	34.913	40.604	0.000	40.604

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/2013: *VA CL*	5,040.219	5,225.911	7,169.783	-	7,169.783	7,150.388	6,475.968	6,004.291	6,126.497	40,799.161	150,316.746
• O&M,N/0204283N: *Sub Ops & Safety*	23.828	25.738	27.175	-	27.175	27.731	29.305	0.000	0.000	Continuing	Continuing
• OPN/0942: *VA CL Support Equipment*	63.908	46.610	66.328	-	66.328	28.465	23.263	22.910	23.326	Continuing	Continuing
• RDT&E/0604580N: *Virginia Payload Module*	94.846	72.861	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.380

Remarks

D. Acquisition Strategy

The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach has facilitated a smoother transition from design to manufacturing and has reduced the number of changes typically encountered during construction of the lead and early follow-on ships. In September 1997, Congress passed a law allowing General Dynamics Electric Boat (GDEB) and Northrop Grumman Newport News (NGNN), now Huntington Ingalls Industries - Newport News Shipbuilding (HII-NNS), to team for production of the first four VIRGINIA Class Submarines. Under the teaming agreement, GDEB remained the design yard for the VIRGINIA Class Submarine and HII-NNS became a part of the IPPD process. The Program Office is managing two Multi-Year Procurement (MYP) contracts. The first is for the Block III (FY09-13) ships. The second is for the Block IV (FY14-18) ships awarded April 2014. All Block I & II ships (SSNs 774-783) have been delivered. The first four Block III ships, SSN 784, SSN785, SSN 786 and SSN 787, delivered in August 2014, June 2015, August 2016 and May 2017 respectively, with the remaining four ships awarded and under construction. The first eight Block IV ships are awarded and under construction, with the remaining two to be authorized and appropriated in FY 2018. The program is currently planning for the fourth MYP (Block V) contract that will reflect 10 SSNs (FY19-23) and is anticipated to award in Early FY 2019.

E. Performance Metrics

Successful completion of Final Operational Test and Evaluation (FOT&E) for Block III modifications. SDIP design completion.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*	Project (Number/Name) 1950 / *New Design SSN Combat Sys Dev*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PTR Corrections	Various	Various : Various	30.088	0.000		0.000		0.000		-		0.000	0.000	30.088	-
Unique Virginia Class Improvements	Various	Various : Various	77.824	8.752	Feb 2017	4.345	Feb 2018	3.750	Feb 2019	-		3.750	Continuing	Continuing	Continuing
Advanced Display Sys (AN/UYQ-70)	SS/CPIF	Lockheed Martin : Keyport, WA	37.789	0.000	Feb 2017	0.000		0.000		-		0.000	0.000	37.789	-
Tech Insertion/Advanced Processing Build (TI/APB) Integration	Various	Various : TBD	0.000	0.000		3.949	Nov 2017	7.195	Nov 2018	-		7.195	Continuing	Continuing	Continuing
Photonics	C/CPIF	Kollmorgen : Northampton, MA	61.051	0.650	Jan 2017	0.000		0.635	Jan 2019	-		0.635	0.000	62.336	-
Large Vertical Array South Dakota Improvement Program	Various	Various : TBD	0.000	0.000		4.518	Nov 2017	6.925	Nov 2018	-		6.925	Continuing	Continuing	Continuing
Platform Integration	SS/CPFF	Electric Boat : Groton, CT	52.560	2.450	Nov 2016	2.621	Nov 2017	6.370	Nov 2018	-		6.370	Continuing	Continuing	Continuing
Photonics	C/CPIF	Lockheed Martin : Manassas, VA	0.000	0.000		0.500	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Electronic Support Measures	C/FFP	Lockheed Martin : Syracuse, NY	38.067	0.000		0.000		0.000		-		0.000	0.000	38.067	-
Virtualization Enabling Architecture Development	Various	Various : TBD	0.000	0.000		4.318	Nov 2017	5.850	Nov 2018	-		5.850	Continuing	Continuing	Continuing
Technology Refreshment	Various	Various : Various	20.355	0.000		0.000		0.000		-		0.000	0.000	20.355	-
Technical Direction Agent	WR	NUWC : Newport, RI	311.140	7.038	Nov 2016	6.222	Nov 2017	5.174	Nov 2018	-		5.174	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Carderock, MD	13.759	0.690	Nov 2016	0.220	Nov 2017	0.220	Nov 2018	-		0.220	Continuing	Continuing	Continuing
Technology Refreshment/ Info. Assurance	C/CPFF	Progeny Systems : Manassas, VA	40.435	0.810	Jan 2017	0.000		0.000		-		0.000	0.000	41.245	-
Acoustic Intercept & Sonar	C/CPFF	Progeny Applied : Manassas, VA	0.000	0.000		0.500	Nov 2017	0.635	Nov 2018	-		0.635	Continuing	Continuing	Continuing
High Frequency & Sonar Sensors	C/CPFF	Applied Research Lab : University of Texas	0.000	0.000		0.300	Nov 2017	0.400	Nov 2018	-		0.400	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*	Project (Number/Name) 1950 / *New Design SSN Combat Sys Dev*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Next Generation Architecture - Electronic Warfare System	WR	NSMA : Various	0.000	0.000		4.145	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	SSC : Charleston, SC	8.727	0.550	Nov 2016	0.800	Nov 2017	1.300	Nov 2018	-		1.300	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC : Keyport, WA	11.890	0.895	Nov 2016	0.800	Nov 2017	0.650	Nov 2018	-		0.650	Continuing	Continuing	Continuing
Miscellaneous	Various	Various : Various	144.342	1.350	Feb 2017	0.675	Feb 2018	0.700	Nov 2018	-		0.700	Continuing	Continuing	Continuing
		Subtotal	848.027	23.185		33.913		39.804		-		39.804	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Various	Various	Various : TBD	6.212	0.000		0.000		0.000		-		0.000	0.000	6.212	-
		Subtotal	6.212	0.000		0.000		0.000		-		0.000	0.000	6.212	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Support Services/ETS	C/CPAF	SEAPORT : Rockville, MD	35.656	2.100	Dec 2016	1.000	Dec 2017	0.800	Dec 2018	-		0.800	Continuing	Continuing	Continuing
DAWDF	Various	Various : Various	0.195	0.000		0.000		0.000		-		0.000	0.000	0.195	-
		Subtotal	35.851	2.100		1.000		0.800		-		0.800	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	890.090	25.285		34.913		40.604		-		40.604	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1950 / *New Design SSN Combat Sys Dev*

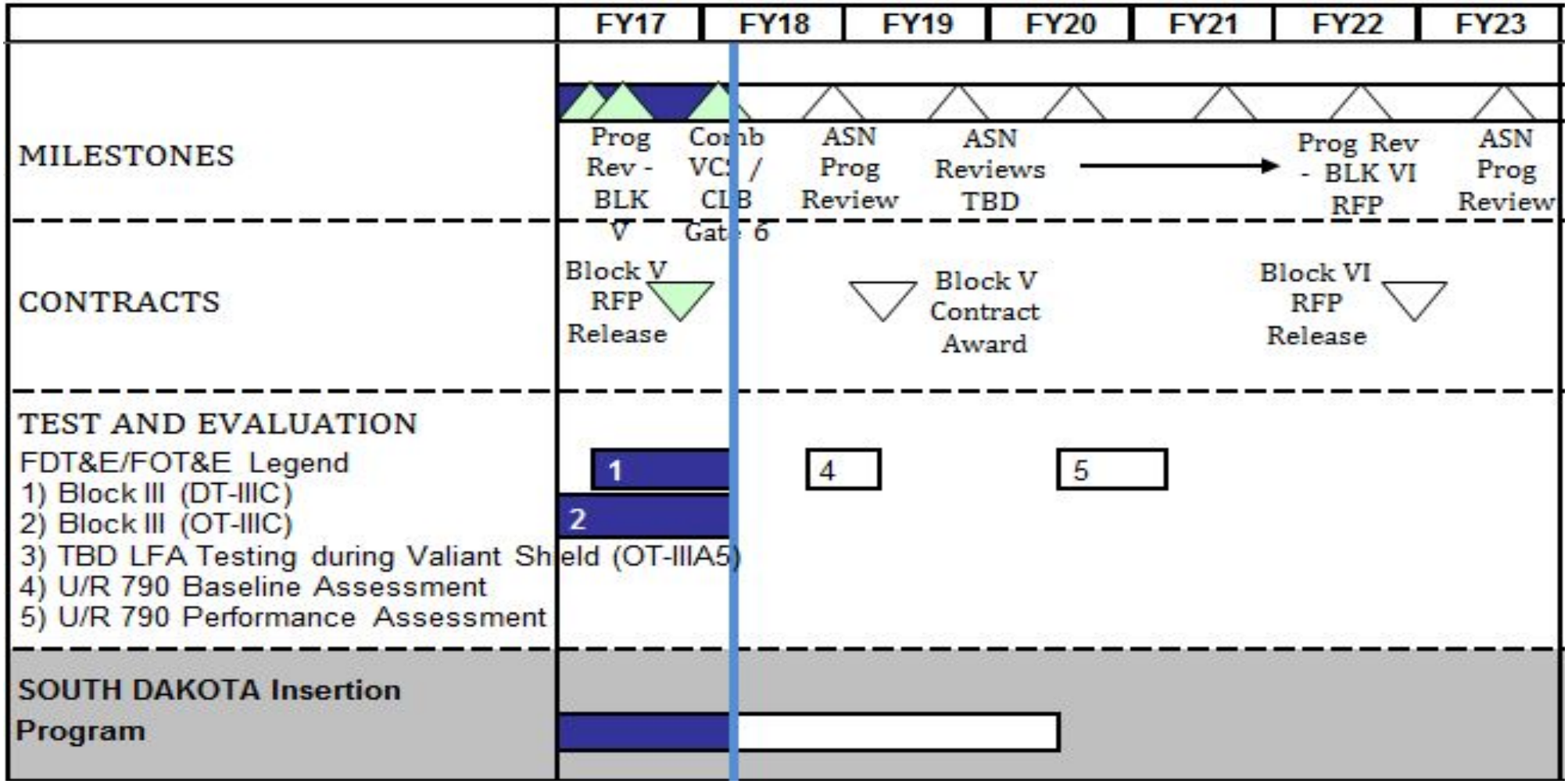


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 1950 / *New Design SSN Combat Sys Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1950				
MILESTONE: Prog Review	1	2017	1	2017
MILESTONE: Acquisition Review - BLK V RFP	2	2017	2	2017
MILESTONE: ASN Reviews (annual) (TBD)	4	2019	4	2023
MILESTONE: Prog Rev BLK VI RFP	3	2022	3	2022
CONTRACTS: Block V RFP Release	4	2017	4	2017
CONTRACTS: Block V Contract Award	1	2019	1	2019
CONTRACTS: Block VI RFP Release	4	2022	4	2022
TEST & EVALUATION: Block III (DT-IIIC)	2	2017	1	2018
TEST & EVALUATION: Block III (OT-IIIC)	1	2017	1	2018
TEST & EVALUATION: U/R 790 Baseline Assessment	2	2018	4	2018
TEST & EVALUATION: U/R 790 Performance Assessment	2	2020	1	2021
SOUTH DAKOTA Improvement Program	1	2017	2	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*	Project (Number/Name) 3062 / *Submarine Multi-Mission Team Trainer*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3062: *Submarine Multi-Mission Team Trainer*	39.817	2.425	2.668	2.661	-	2.661	2.720	2.783	2.843	2.901	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

To achieve desired submarine force readiness levels, it is necessary to construct highly sophisticated shore based Combat System Team Trainers capable of training personnel in all aspects of submarine approach, attack and surveillance operations in a controlled, simulated environment. The Combat Control System (CCS) MK1, CCS MK2, and AN/BYG-1, along with sonar systems AN/BSY-1, AN/BQQ-5, and AN/BQQ-10 are installed on SSN and SSGN class submarines. These tactical systems are planned for future upgrades with the next hardware and software revisions which will provide enhanced War Fighter capabilities. The Tactical Acoustic Rapid COTS (commercial-off-the-shelf) Insertion (ARCI) phased upgrades are also being installed with future revisions. The Advanced Processing Builds (APB) and Technical Insertion (TI) sensors, which feed technology insertion into the CCS/Acoustic development, directly impact the trainers.

The Submarine Multi-Mission Team Trainer (SMMTT) supports operator, employment, strike, and Battle Group training for enlisted and officer pipelines. The SMMTT provides operators and combat teams the opportunity to train ashore, prior to, and between deployments. The shore based training provides a means of maintaining team proficiency in stand alone or in combined team mode prior to ship deployment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Submarine Multi-Mission Team Trainer	2.425	2.668	2.661	0.000	2.661
Articles:	-	-	-	-	-
Description: To achieve desired submarine force readiness levels, it is necessary to construct highly sophisticated shore based Combat System Team Trainers capable of training personnel in all aspects of submarine approach, attack and surveillance operations in a controlled, simulated environment.					
FY 2018 Plans: Develop implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays. These efforts include new sensor developments and simulations to match advancements in tactical systems supported by SMMTT. These efforts will also integrate the APB into the SMMTT baseline along with completing and integrating the LCCA sensor.					
FY 2019 Base Plans: Develop implementation of latest Advanced Processor Build (APB), Technical Insertion (TI) and associated training displays. These efforts include new sensor developments and simulations to match advancements in					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 3062 / *Submarine Multi-Mission Team Trainer*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
tactical systems supported by SMMTT. These efforts will also integrate the APB into the SMMTT baseline along with completing and integrating the LCCA sensor. This also includes the development and integration of APB software into the SSGN 726 build. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY18 to FY19.					
Accomplishments/Planned Programs Subtotals	2.425	2.668	2.661	0.000	2.661

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/5661: *Submarine Training Device Mods*	48.020	74.550	66.708	-	66.708	76.169	70.674	81.220	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

The SMMTT program software development is accounted for in this RDTEN line. All production kits are procured in OPN PE 0804731N BLI 566100.

E. Performance Metrics

Within 90 days of introduction to the Fleet, this RDTEN project shall develop required changes to the Control and Display Documentation and Interface Description Language (IDL) Interfaces for the initial development for new sensors that are required to simulate/stimulate the TI/APB for the AN/BQQ-5 and AN/BYG-1 in the SMMTT Trainer.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 3062 / *Submarine Multi-Mission Team Trainer*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Development	Reqn	NSWC/CD : Bethesda, MD	29.750	1.200	Dec 2016	1.223	Jan 2018	1.300	Jan 2019	-		1.300	Continuing	Continuing	Continuing
Component Development	C/CPFF	ARL : UT Austin	2.745	0.250	Dec 2016	0.298	Feb 2018	0.300	Feb 2019	-		0.300	Continuing	Continuing	Continuing
Component Development	Reqn	NUWC/NPT : Newport, RI	7.322	0.975	Dec 2016	1.147	Jan 2018	1.061	Jan 2019	-		1.061	0.000	10.505	-
		Subtotal	39.817	2.425		2.668		2.661		-		2.661	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	39.817	2.425		2.668		2.661		-		2.661	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 3062 / *Submarine Multi-Mission Team Trainer*

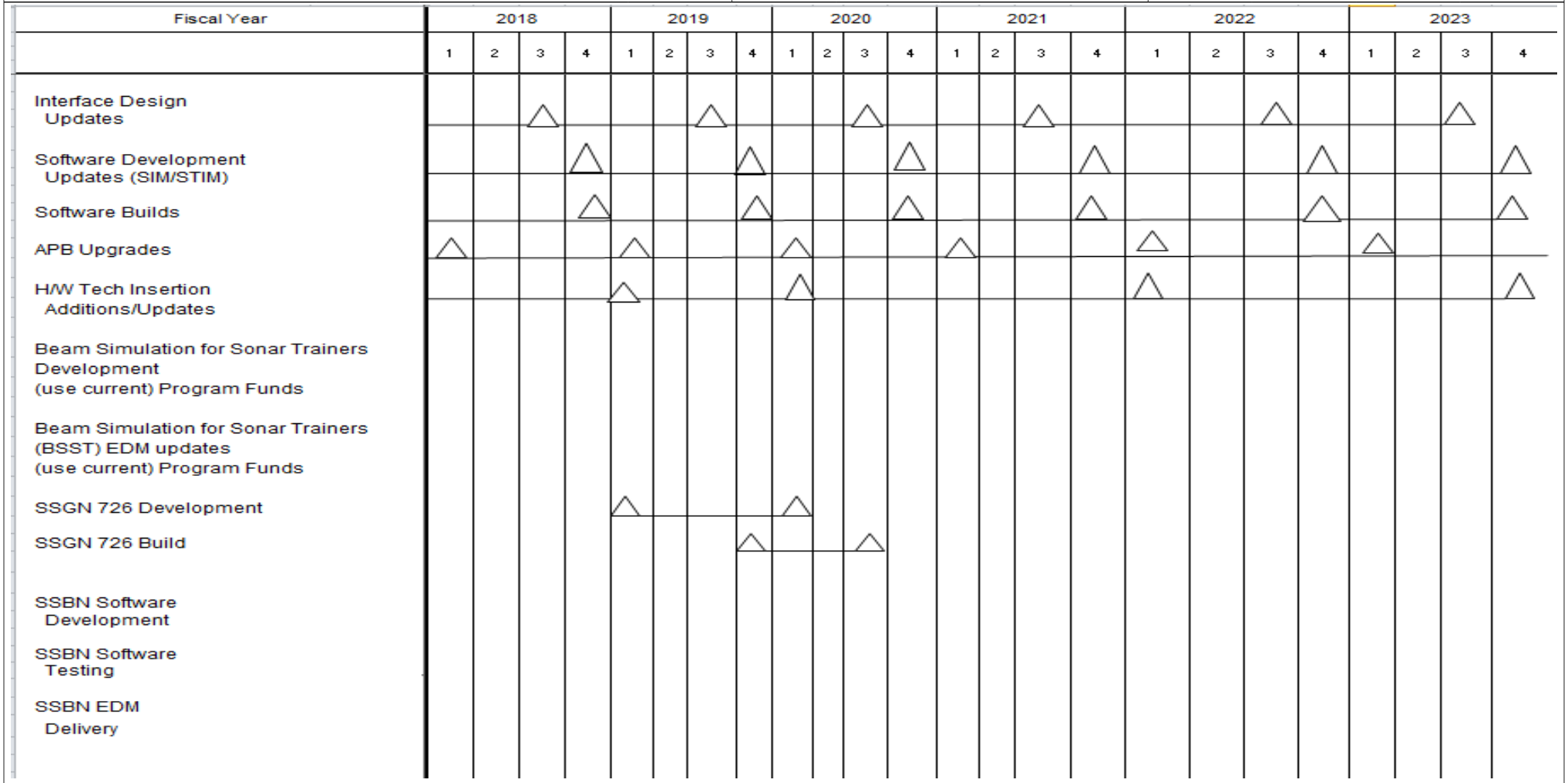


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 3062 / *Submarine Multi-Mission Team Trainer*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3062				
Interface design updates: Interface Design Updates	3	2017	4	2023
Software Development Updates: Software Development Updates (SIM/STIM)	4	2017	4	2023
Software Builds: Software Builds	4	2017	4	2023
Advanced Processing Build(APB) Upgrades: Advanced Processing Build (APB) Upgrades	1	2017	4	2023
Hard Ware Tech Insertion Updates: Hard Ware Tech Insertion Updates	1	2017	4	2023
Beam Simulation for Sonar Trainers: Beam Simulation for Sonar Trainers	1	2017	4	2023
SSGN 726 Development: SSSGN Development	1	2019	1	2020
SSGN 726 Build: SSGN 726 Build	4	2019	3	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	26.574	16.441	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	43.015
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY17 RDT&E Congressional add for small business technology insertion will be applied to existing small business contracts to continue VA Class combat systems development in the areas of sonar, electronic warfare, weapons systems launch, information assurance and advanced submarine control systems.

The FY17 RDT&E Congressional add for Program Increase is for electronic warfare enhancements .

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Program Increase ***FY 2017 Accomplishments:*** N/A ***FY 2018 Plans:*** N/A	6.770	0.000
Congressional Add: Small Business Technology Insertion ***FY 2017 Accomplishments:*** N/A ***FY 2018 Plans:*** N/A	9.671	0.000
Congressional Adds Subtotals	16.441	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Successful completion of Milestone III Review. Successful completion of Final Operational Test and Evaluation (FOT&E) for Technology Insertion (TI)-08 and Block III.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604558N / *New Design SSN*	Project (Number/Name) 9999 / *Congressional Adds*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Electronic Warfare Enhancements	C/CPFF	Progeny Systems : Manassas, VA	26.574	16.441	Aug 2017	0.000		0.000		-		0.000	0.000	43.015	-
		Subtotal	26.574	16.441		0.000		0.000		-		0.000	0.000	43.015	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	26.574	16.441		0.000		0.000		-		0.000	0.000	43.015	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 9999 / *Congressional Adds*

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
VA Class Small Business Technology Insertion: VA Class Small Business Technology Insertion																												

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604558N / *New Design SSN*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
VA Class Small Business Technology Insertion: VA Class Small Business Technology Insertion	1	2017	4	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604562N *I Submarine Tactical Warfare System*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	591.315	50.069	50.850	60.824	-	60.824	63.853	65.186	66.491	67.876	Continuing	Continuing
0236: *SSN Comb Cont Sys Imprvmnt (ENG)*	582.143	41.365	50.850	60.824	-	60.824	63.853	65.186	66.491	67.876	Continuing	Continuing
9999: *Congressional Adds*	9.172	8.704	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.876

A. Mission Description and Budget Item Justification

Project Unit 0236: This program develops Commercial-Off-The-Shelf (COTS) based software and hardware upgrades to integrate improved tactical and weapons control capabilities for multiple submarine Classes (SSN-688, SSGN, SEAWOLF, SSBN and VIRGINIA (Post Shakedown Availability)). The AN/BYG-1 is the combat control system common across submarine platforms which incorporates tactical control, payload control, and tactical Local Area Network (LAN) functions into a single development program. AN/BYG-1 allows the submarine to rapidly update the ship safety tactical picture, integrate the common tactical picture into the battlegroup, improve torpedo interfaces, and provide Tactical TOMAHAWK (TOMAHAWK Block IV) capability. The hardware upgrades, Technology Insertions (TI) are developed on a biennial basis to provide improved capability and address COTS obsolescence. Funding also accommodates the biennial integration of software Advanced Processing Builds (APB) for both tactical control (APB(T)) and payload control (APB(P)) subsystems. The tactical control integration effort incorporates the integration of other sensor (ESM, sonar, radar, etc.) inputs to provide a common operational picture and improved situational awareness in an information assurance (IA) compliant environment.

The Weapons Control development effort is winding down with pending completion of TI-16 APB15. The Payload Control System upgrade provides a modernized PCS open architecture to support future payloads and integrate a common unmanned system controller. Advanced Weapons Enhanced by Submarine Unmanned Aerial System Against Mobile Targets (AWESUM), Joint Capability Technical Demonstration (JCTD), Experimental Fuel Cell (XFC), Unmanned Ariel System integration and transition to production.

Provides funding for the development of Payloads Launch System, Multi-tube Weapons System (MTWS), Information Assurance (IA) system, Onboard Team Trainer (OBTT), and Command, Control, Computer and Intelligence Maintenance Tool (C3IMT). FY 18 adds development of a Common Infrastructure Services (CIS) subsystem. This involves integration of Onboard Team Trainer - Master Controller (OBTT - MC) & Command, Control, Computer and Intelligence Maintenance Tool (C3IMT)/Inter-Subsystem Monitoring Tool (ISMT) efforts as well as other common services within SWFTS. CIS will be an independent subsystem with its own software development and testing efforts, requiring additional funding to complete product delivery to platforms.

FY18 integrates additional Tactical Data Link (TDL) capabilities for Command & Control situational awareness. FY18 also provides additional R&D effort for payload integration to support MK48, APB 5+, APB 6 effort.

FY19 provides funding to commence development of APB 19 which will add two new software baselines in support of VA BLK IV Virginia Pay Module (VPM) and the COLUMBIA class. Cyber security efforts continue to grow due increasing interconnection complexity, more IP based traffic in future baselines, and development of

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604562N *I Submarine Tactical Warfare System*

Cyber Safe Controls. Common Infrastructure Services (CIS) development efforts begin under a new contract for APB 19 and continue on APB 17 under the current Tactical Control System contract. As additional software applications are migrated to CIS additional funding of this effort is required. Additional funding for early integration efforts for submarine payloads including Contender, Maritime Strike Tomahawk (MST), Next Generation Countermeasure, Anti-Torpedo Torpedo Compact Rapid Attack Weapons program (ATT CRAW) is also included in the FY 19 funding.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	43.160	50.850	62.064	-	62.064
Current President's Budget	50.069	50.850	60.824	-	60.824
Total Adjustments	6.909	0.000	-1.240	-	-1.240
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.247	0.000			
• SBIR/STTR Transfer	-1.844	0.000			
• Program Adjustments	0.000	0.000	-0.485	-	-0.485
• Rate/Misc Adjustments	0.000	0.000	-0.755	-	-0.755
• Congressional Add Adjustments	9.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Combat and Weapons Systems Modernization*	8.704	0.000
Congressional Add Subtotals for Project: 9999	8.704	0.000
Congressional Add Totals for all Projects	8.704	0.000

Change Summary Explanation

The FY 2019 funding request was reduced by $0.485 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Details on funding increase/decrease from FY18 to FY19 totaling to +$10 million are contained in each sub-project.

FY19 provides funding to commence development of APB 19 which will add two new software baselines in support of Virginia Block V Virginia Pay Module (VPM) and the COLUMBIA class. Cyber security efforts continue to grow due to increasing interconnection complexity, more IP based traffic in future baselines, and

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604562N *I Submarine Tactical Warfare System*

development of Cyber Safe Controls. Common Infrastructure Services (CIS) development efforts begin under a new contract for APB 19 and continue on APB 17 under the current Tactical Control System contract. As additional software applications are migrated to CIS additional funding of this effort is required. Additional funding for early integration efforts for submarine payloads including Contender, Maritime Strike Tomahawk (MST), Next Generation Countermeasure, Anti-Torpedo Torpedo Compact Rapid Attack Weapons program (ATT CRAW) is also included in the FY 19 funding.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604562N / *Submarine Tactical Warfare System*	Project (Number/Name) 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0236: *SSN Comb Cont Sys Imprvmnt (ENG)*	582.143	41.365	50.850	60.824	-	60.824	63.853	65.186	66.491	67.876	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Unit 0236: This program develops Commercial-Off-The-Shelf (COTS) based software and hardware upgrades to integrate improved tactical and weapons control capabilities for multiple submarine Classes (SSN-688, SSGN, SEAWOLF, SSBN and VIRGINIA (Post Shakedown Availability)). The AN/BYG-1 is the combat control system common across submarine platforms which incorporates tactical control, payload control, and tactical Local Area Network (LAN) functions into a single development program. AN/BYG-1 allows the submarine to rapidly update the ship safety tactical picture, integrate the common tactical picture into the battlegroup, improve torpedo interfaces, and provide Tactical TOMAHAWK (TOMAHAWK Block IV) capability. The hardware upgrades, Technology Insertions (TI) are developed on a biennial basis to provide improved capability and address COTS obsolescence. Funding also accommodates the biennial integration of software Advanced Processing Builds (APB) for both tactical control (APB(T)) and payload control (APB(P)) subsystems. The tactical control integration effort incorporates the integration of other sensor (ESM, sonar, radar, etc.) inputs to provide a common operational picture and improved situational awareness in an information assurance (IA) compliant environment.

The Weapons Control development effort is winding down with pending completion of TI-16 APB15. The Payload Control System upgrade provides a modernized PCS open architecture to support future payloads and integrate a common unmanned system controller. Advanced Weapons Enhanced by Submarine Unmanned Aerial System Against Mobile Targets (AWESUM), Joint Capability Technical Demonstration (JCTD), Experimental Fuel Cell (XFC), Unmanned Ariel System integration and transition to production.

Provides funding for the development of Payloads Launch System, Multi-tube Weapons System (MTWS), Information Assurance (IA) system, Onboard Team Trainer (OBTT), and Command, Control, Computer and Intelligence Maintenance Tool (C3IMT). FY 18 adds development of a Common Infrastructure Services (CIS) subsystem. This involves integration of Onboard Team Trainer - Master Controller (OBTT - MC) & Command, Control, Computer and Intelligence Maintenance Tool (C3IMT)/Inter-Subsystem Monitoring Tool (ISMT) efforts as well as other common services within SWFTS. CIS will be an independent subsystem with its own software development and testing efforts, requiring additional funding to complete product delivery to platforms.

FY18 integrates additional Tactical Data Link (TDL) capabilities for Command & Control situational awareness. FY18 also provides additional R&D effort for payload integration to support MK48, APB 5+, APB 6 efforts and early integration efforts for submarine payloads including Contender, Maritime Strike Tomahawk (MST), Next Generation Countermeasure, Anti-Torpedo Torpedo Compact Rapid Attack Weapons program (ATT CRAW) as well as development of CyberSafe Controls.

FY19 provides funding to commence development of APB 19 which will add two new software baselines in support of VA BLK IV Virginia Pay Module (VPM) and the COLUMBIA class. Cyber security efforts continue to grow due increasing interconnection complexity, more IP based traffic in future baselines, and development of Cyber Safe Controls. Common Infrastructure Services (CIS) development efforts begin under a new contract for APB 19 and continue on APB 17 under the current

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

Tactical Control System contract. As additional software applications are migrated to CIS additional funding of this effort is required. Additional funding for early integration efforts for submarine payloads including Contender, Maritime Strike Tomahawk (MST), Next Generation Countermeasure, Anti-Torpedo Torpedo Compact Rapid Attack Weapons program (ATT CRAW) is also included in the FY 19 funding.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Advanced Processing Builds	15.461	19.245	20.282	0.000	20.282
Articles:	-	-	-	-	-
FY 2018 Plans: Complete development of APB-17 into AN/BYG-1 (TI-16) baseline. Support development of APB-19 into AN/BYG-1 baseline (TI-18). Included in the APB effort for FY 18 is the addition of the SSBN software baseline needed for the conversion of the SSBN Combat Control System from legacy to the TI/APB model. FY 18 also adds development of a Common Infrastructure Services (CIS) subsystem.					
FY 2019 Base Plans: Begin development of APB-17 into AN/BYG-1 (TI-18) baseline. Continue development of APB-19 into AN/BYG-1 (TI-18)baseline. Adds 2 new software baselines in APB19 (VPM & Columbia).					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increased effort to add VCS VPM and Columbia software baselines					
Title: AN/BYG-1 TI-20	0.000	0.000	5.737	0.000	5.737
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Begin development, integration and test of the next generation AN/BYG-1 (TI-20) for SSN VA Class and COLUMBIA SSBN submarines to include Common Weapons Launcher (CWL) modernization development.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase due to first year of TI-20 effort.					
Title: AN/BYG-1 TI-16	6.782	3.996	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Complete development, integration and test of the next generation AN/BYG-1 (TI-16) for SSN SEAWOLF/SSBN/ VA Class submarines. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** TI-16 efforts complete.					
Title: AN/BYG-1 TI-18	4.570	8.178	7.707	0.000	7.707
Articles:	-	-	-	-	-
FY 2018 Plans: Continue development, integration and test of the next generation AN/BYG-1 (TI-18) for SSN 688/SSGN/SSBN Class submarines. ***FY 2019 Base Plans:*** Complete development, integration and test of the next generation AN/BYG-1 (TI-18) for SSN 688/SSGN/SSBN Class submarines. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY18 to FY19 is in accordance with planned program profile and is not due to a negative action against this effort.					
Title: Payload Integration	0.000	1.777	5.947	0.000	5.947
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Software development efforts to support Mk 48 APB5+. This funding was included in sub project "Advanced Processing Builds" in the FY 18 budget. With the addition of multiple future payloads, the integration effort has been split out into its own subproject. ***FY 2019 Base Plans:*** Continue software development efforts to support Mk 48 APB5+ efforts. Additional funding for early integration efforts for submarine payloads including MK 48 APB6, Contender, Maritime Strike Tomahawk (MST), Next Generation Countermeasure, and Anti-Torpedo Torpedo Compact Rapid Attack Weapons program (ATT CRAW). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Additional funding for early integration efforts for submarine payloads including MK-48 APB6, Contender , Maritime Strike Tomahawk (MST), Next Generation Countermeasure, and Anti-Torpedo Torpedo Compact Rapid Attack Weapons program (ATT CRAW).					
Title: Testing	3.987	3.113	3.176	0.000	3.176
Articles:	-	-	-	-	-
FY 2018 Plans: Begin DT/OT for AN/BYG-1 APB-17 on SSN 688/SEAWOLF/SSBN/SSGN/VA Class submarines. ***FY 2019 Base Plans:*** Continue DT/OT for AN/BYG-1 APB-17 on SSN 688/SEAWOLF/SSBN/SSGN/VA Class submarines. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to inflation.					
Title: Payload Control System Upgrade	5.911	6.029	4.224	0.000	4.224
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue development to modernize the Payload Control System software code and architecture. An open system architecture supports more efficient future integration of payloads. FY18 is a ramp up in effort as APB 17 efforts ramp up. APB 17 will be the first baseline to include PCS in place of WCS. ***FY 2019 Base Plans:*** Complete development to modernize the Payload Control System software code and architecture. Contains additional efforts to integrate of a common UxV interface that will be delivered with APB 19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Effort ramping down as rearchitecture completes and deployed in APB17. Recurring PCS efforts captured in APB subproject.					
Title: Information Assurance (IA)	2.082	4.190	7.474	0.000	7.474
Articles:	-	-	-	-	-
FY 2018 Plans: Develop integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-18. FY18 growth supports the identification and development of CYBERSAFE controls including the development of Cyber Conditions of Readiness (X, Y, Z), the implementation of Risk Management Framework (RMF), the execution of Cybersecurity Vulnerability Assessments and the addition of new of SPAWAR IT/IA standards (host level protection, boundary protection, security information, event management and more). Continues growth of Cyber Security efforts in support of CyberSafe implementation, RMF continuous monitoring, and implementation of SPAWAR IA Technical Authority Board (TAB) standards. ***FY 2019 Base Plans:*** Complete development integration of IA Toolkit and continue IA Certification Testing on BYG-1 TI-18. Develop IA Toolkit and commence IA certification Testing on BYG-1 TI-20. Continue RMF accreditations for various systems. Cyber security efforts continue to grow due increasing interconnection complexity, more IP based traffic in future baselines, and implementation of Cyber Safe Controls. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Cyber security efforts continue to grow due increasing interconnection complexity, more IP based traffic in future baselines, and implementation of Cyber Safe Controls.					
Title: Unmanned Aerial System (UAS)	2.572	2.622	1.147	0.000	1.147
Articles:	-	-	-	-	-
FY 2018 Plans: Continue Unmanned Aerial System (UAS) development and integration efforts for 3 Submarine launched UAS (SLUAS). Begin development and integration efforts for 21 inch Submarine launched UAS (SLUAS). ***FY 2019 Base Plans:*** Continue Unmanned Aerial System (UAS) development and integration efforts for 3 and 21 inch Submarine launched UAS (SLUAS). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Reduced R&D as 3 inch UAS transitions to production phase.					
Title: Common Infrastructure Services (CIS)	0.000	1.700	5.130	0.000	5.130
Articles:	-	-	-	-	-
FY 2018 Plans: Initial funding for Common Infrastructure Services integrates Onboard Team Trainer - Master Controller (OBTT - MC) & Command, Control, Computer and Intelligence Maintenance Tool (C3IMT)/Inter-Subsystem Monitoring Tool (ISMT) efforts as well as other common services within SWFTS. CIS will be an independent subsystem with its own software development and testing efforts, requiring additional funding to complete product delivery to platforms. FY18 consists of one TI/APB baseline. ***FY 2019 Base Plans:*** Continue funding for Common Infrastructure Services integrates Onboard Team Trainer - Master Controller (OBTT - MC) & Command, Control, Computer and Intelligence Maintenance Tool (C3IMT)/Inter-Subsystem Monitoring Tool (ISMT) efforts as well as other common services within SWFTS. CIS will be an independent subsystem with its own software development and testing efforts, requiring additional funding to complete					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
product delivery to platforms. Common Information Subsystem (CIS) development efforts begin under a new contract for APB 19 and continue on APB 17 under the current Tactical Control System contract. As additional software applications are migrated to CIS additional funding of this effort is required. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** CIS consists of three TI/APB baselines in FY19 vice one TI/APB baseline in FY18. The increase in funding is directly attributable to the increase in the number of baselines.					
Accomplishments/Planned Programs Subtotals	41.365	50.850	60.824	0.000	60.824

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/5420: *SSN Combat Control Systems*	144.715	129.972	129.501	-	129.501	149.915	225.596	197.049	261.229	Continuing	Continuing

Remarks

OPN BA4 Ordinance Support & Equipment. BLI 5420 SSN Combat Control Systems

D. Acquisition Strategy

This budget integrates APBs developed by the advanced development community.
This program has been tailored in accordance with the new DoD5000 directive to incorporate annual MDA production reviews.
Advanced Processing Builds (APB) products associated with AN/BYG-1 Release-To-Fleet 3Q 2017, 3Q 2019 and 3Q 2021.

E. Performance Metrics

AN/BYG-1 Submarine Combat and Payload Control System performance metrics for each Advanced Processor Build (APB) and Technology Insertion (TI) cycle are contained in the classified Capability Production Document (CPD) annex to the overarching system requirements as laid out in the Capabilities Development Document (CDD). Each APB cycle receives an updated CPD based on fleet required capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AN/BYG-1 TECH INSERTION	C/CPIF	GENERAL DYNAMICS (GDAIS) : FAIR LAKES, VA	95.368	5.113	Oct 2016	6.645	Oct 2017	9.623	Oct 2018	-		9.623	Continuing	Continuing	Continuing
AN/BYG-1 TECH INSERTION	C/CPIF	GENERAL DYNAMICS (GDAIS) : PITTSFIELD, MA	41.333	0.661	Oct 2016	0.200	Oct 2017	0.000	Oct 2018	-		0.000	Continuing	Continuing	Continuing
AN/BYG-1 TECH INSERTION	C/CPIF	PROGENY (PCS) : MANASSAS, VA	1.616	2.027	Oct 2016	6.537	Oct 2017	9.594	Oct 2018	-		9.594	Continuing	Continuing	Continuing
GOVERNMENT ENGINEERING	WR	NUWC : NEWPORT, RI	83.551	1.427	Oct 2016	1.812	Oct 2017	3.848	Oct 2018	-		3.848	Continuing	Continuing	Continuing
INFORMATION ASSURANCE	C/CPAF	PROGENY : MANASSAS, VA	37.255	2.082	Oct 2016	4.190	Oct 2017	7.474	Oct 2018	-		7.474	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSTEM	C/CPIF	GENERAL DYNAMICS : FAIR LAKES, VA	0.000	1.087	Oct 2016	0.432	Oct 2017	0.216	Oct 2018	-		0.216	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSTEM	WR	NUWC : NEWPORT, RI	0.000	1.061	Oct 2016	1.082	Oct 2017	0.459	Oct 2018	-		0.459	Continuing	Continuing	Continuing
UNMANNED AERIAL SYSEM	C/CPIF	PROGENY (PCS) : MANASSAS, VA	0.000	0.424	Oct 2016	1.108	Oct 2017	0.472	Oct 2018	-		0.472	Continuing	Continuing	Continuing
		Subtotal	259.123	13.882		22.006		31.686		-		31.686	Continuing	Continuing	N/A

Remarks

Progeny, NUWC NPT, and General Dynamics AN/BYG-1 tech insertion funding amounts increase above inflation in FY19 due to the ramping up of payload integration, Common Infrastructure Services, and Tactical Data Link efforts. Progeny IA funding increases due to ramping up of Cybersafe initiatives.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
APB SOFTWARE INTEGRATION	C/CPIF	GENERAL DYNAMICS	81.413	7.300	Oct 2016	7.446	Oct 2017	7.594	Oct 2018	-		7.594	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604562N / *Submarine Tactical Warfare System*	Project (Number/Name) 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		(GDAIS) : FAIRLAKES, VA													
APB SOFTWARE INTEGRATION	C/CPIF	GENERAL DYNAMICS : PITTSFIELD, MA	27.250	0.600	Oct 2016	0.272	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
APB SOFTWARE INTEGRATION	WR	NUWC : NEWPORT, RI	54.162	4.672	Oct 2016	4.765	Oct 2017	4.860	Oct 2018	-		4.860	Continuing	Continuing	Continuing
APB SOFTWARE INTEGRATION	C/CPAF	LOCKHEED MARTIN (LM-MSS) : MANASSAS, VA	14.680	3.600	Oct 2016	3.672	Oct 2017	3.745	Oct 2018	-		3.745	Continuing	Continuing	Continuing
APB SOFTWARE INTEGRATION	C/CPFF	PROGENY (PCS) : MANASSAS, VA	0.870	4.208	Oct 2016	4.705	Oct 2017	4.799	Oct 2018	-		4.799	Continuing	Continuing	Continuing
SOFTWARE DEVELOPMENT	Various	VARIOUS : VARIOUS:Not Specified	51.875	2.283	Oct 2016	2.329	Oct 2017	2.375	Oct 2018	-		2.375	Continuing	Continuing	Continuing
		Subtotal	230.250	22.663		23.189		23.373		-		23.373	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DEVELOPMENT TEST & EVALUATION	WR	NUWC : NEWPORT, RI	37.113	0.949	Oct 2016	0.968	Oct 2017	0.987	Oct 2018	-		0.987	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPIF	GENERAL DYNAMICS : FAIRLAKES, VA	9.408	0.724	Oct 2016	0.739	Oct 2017	0.753	Oct 2018	-		0.753	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPIF	GENERAL DYNAMICS : PITTSFIELD, MA	3.512	0.724	Oct 2016	0.739	Oct 2017	0.753	Oct 2018	-		0.753	Continuing	Continuing	Continuing
TEST & EVALUATION	C/CPAF	PROGENY : MANASSAS, VA	1.839	0.474	Oct 2016	0.483	Oct 2017	0.492	Oct 2018	-		0.492	Continuing	Continuing	Continuing
OPERATIONAL TEST & EVALUATION	WR	COMOPTEVFOR : NORFOLK, VA	16.832	0.080	Oct 2016	0.820	Oct 2017	0.836	Oct 2018	-		0.836	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604562N / *Submarine Tactical Warfare System*	Project (Number/Name) 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	68.704	2.951		3.749		3.821		-		3.821	Continuing	Continuing	N/A

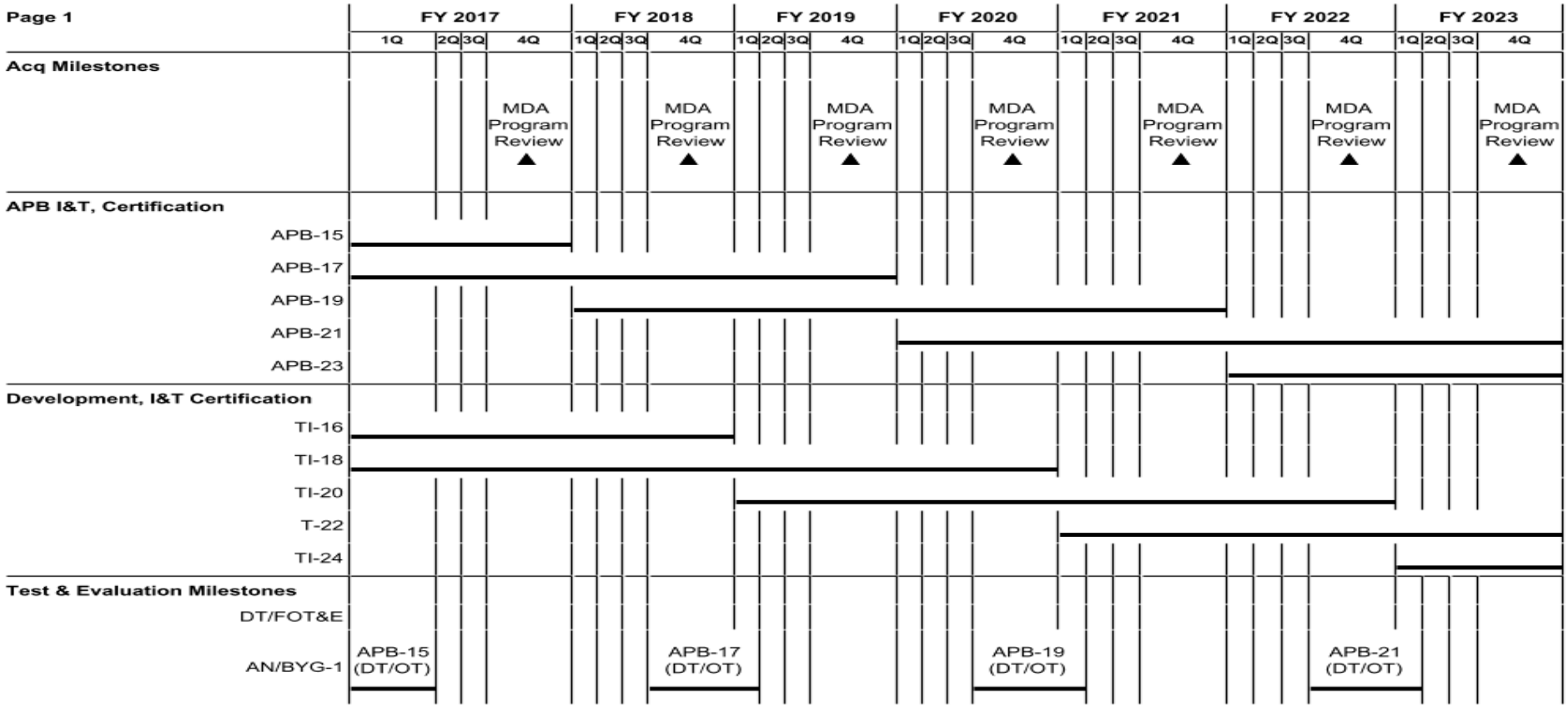
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PROGRAM MANAGEMENT SUPPORT	C/CPFF	VARIOUS : VARIOUS:Not Specified	24.066	1.869	Oct 2016	1.906	Oct 2017	1.944	Oct 2018	-		1.944	Continuing	Continuing	Continuing
		Subtotal	24.066	1.869		1.906		1.944		-		1.944	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	582.143	41.365		50.850		60.824		-		60.824	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*



2019DON - 0604562N - 0236

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 0236 / *SSN Comb Cont Sys Imprvmnt (ENG)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Page 1				
Acq Milestones: Annual MDA Program Review - FY17	4	2017	4	2017
Acq Milestones: Annual MDA Program Review - FY18	4	2018	4	2018
Acq Milestones: Annual MDA Program Review - FY19	4	2019	4	2019
Acq Milestones: Annual MDA Program Review - FY20	4	2020	4	2020
Acq Milestones: Annual MDA Program Review - FY21	4	2021	4	2021
Acq Milestones: Annual MDA Program Review - FY22	4	2022	4	2022
Acq Milestones: Annual MDA Program Review - FY23	4	2023	4	2023
APB I&T, Certification: APB-15: APB-15	1	2017	4	2017
APB I&T, Certification: APB-17: APB-17	1	2017	4	2019
APB I&T, Certification: APB-19: APB-19	1	2018	4	2021
APB I&T, Certification: APB-21: APB-21	1	2020	4	2023
APB I&T, Certification: APB-23: APB-23	1	2022	4	2023
Development, I&T Certification: TI-16: TI-16	1	2017	4	2018
Development, I&T Certification: TI-18: TI-18	1	2017	4	2020
Development, I&T Certification: TI-20: TI-20	1	2019	4	2022
Development, I&T Certification: T-22: TI-22	1	2021	4	2023
Development, I&T Certification: TI-24: TI-24	1	2023	4	2023
Test & Evaluation Milestones: AN/BYG-1: APB-15 DT/OT	1	2017	1	2017
Test & Evaluation Milestones: AN/BYG-1: APB-17 DT/OT	4	2018	1	2019
Test & Evaluation Milestones: AN/BYG-1: APB-19 DT/OT	4	2020	1	2021
Test & Evaluation Milestones: AN/BYG-1: APB-21 DT/OT	4	2022	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604562N / *Submarine Tactical Warfare System*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	9.172	8.704	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.876
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project Unit 9999:

FY17 congressional add provides funding to modernize Advanced Weapons Enhanced by Submarine Unmanned Aerial System Against Mobile Targets (AWESUM)

Provides funding to continue Submarine Launched Unmanned Aerial Systems (SLUAS) development and that of the All Up Round (AUR) derived from the Office of Secretary Defense AWESUM Joint Capabilities Technology Demonstration (JCTD) in the efforts below. The AWESUM AUR is defined as the combination of the Blackwing UAV and the Hammerhead Cannister.

Execute AUR reliability and manufacturing improvement plan:
-Hammerhead canister and Blackwing UAV hardware and software improvements
-Focus on reliability and manufacturing efficiencies to reduce unit cost
-Establish and incorporate comprehensive test program
-Maximize AUR modularity of design and growth potential for future capabilities
-Perform select capability, performance and cyber compliance improvements
-Explore AUR endurance improvement, shipboard transmission control and bandwidth management

Perform schedule alignment with TI-18/APB-19.
Increase UAS/BYG-1 interface security by improving encryption and achieving IA certification for unrestricted use.
Perform BYG-1 and Controller Interface update.
Procure one shipset of AURs for use on current SLUAS capable ship for training, CONOPS, and Techniques and Procedures (TTP) development. Resolve training issues with Type Commanders.
Support the development of a common communications solution that enables employment of the SLUAS across multiple submarine platforms.

Develop a Capabilities Production Document and Performance Specification in support of establishment of Program of Record.

Procure Hardware in the Loop (HWIL) and Plane on a Board (POAB) simulators in support of training and BYG-1 integration and testing.

Establish MISSIONALT for use on 688I's.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Combat and Weapons Systems Modernization	8.704	0.000
FY 2017 Accomplishments: Continue development of the AWESUM AUR that derived from its JCTD, and initial fleeting fielding of 2-3 SSN 688I submarines.		
FY 2018 Plans: N/A		
Congressional Adds Subtotals	8.704	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Once developed, these modernization upgrades will be part of the TI/APB software baselines, utilizing the same Acquisition Strategy as the Tactical Warfare System.
The program budget integrates APBs developed by the advanced development community.
This program has been tailored in accordance with the new DoD5000 directive to incorporate annual MDA production reviews.
Advanced Processing Builds (APB) products associated with AN/BYG-1 Release-To-Fleet 3Q 2017, 3Q 2019 and 3Q 2021.

Near term: Continued refinement of the AWESUM AUR with improvements in reliability, maturity of design, IA compliance and compatibility with the Common Communications solution being developed with PMS 425 and SEA 073.
Far term: Within Five years, leveraging the discovery from near term efforts and achieving actual feedback from fleet operations, the Program expects to go to submit a RFP to best produce the next generation of AUR development and system employment.
SLUAS Controller modernization upgrades will be incorporated into the TI/APB software baselines, utilizing the same Acquisition Strategy as the Tactical Warfare System for BYG-1.
This program has been tailored in accordance with the new DoD 5000 directive to incorporate annual MDA production reviews.

E. Performance Metrics

AN/BYG-1 Submarine Combat and Payload Control System performance metrics for each Advanced Processor Build (APB) and Technology Insertion (TI) cycle are contained in the classified Capability Production Document (CPD) annex to the overarching system requirements as laid out in the Capabilities Development Document (CDD). Each APB cycle receives an updated CPD based on Fleet required capabilities.

In transition from the JCTD, initial Key Performance Parameters and Key Attributes are contained in the Functional Requirements Document, as established by COMPSUBPAC and modified by OPNAV N97.
In establishing the Program of Record, a Performance Specification and a Capability Production Document (CPD) are being developed.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 9999 / *Congressional Adds*

AN/BYG-1 Submarine Combat and Payload Control System performance metrics for each Advanced Processor Build (APB) and Technology Insertion (TI) cycle are contained in the classified CPD annex to the overarching system requirements as laid out in the Capabilities Development Document (CDD). Each APB cycle receives an updated CPD based on Fleet required capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604562N / *Submarine Tactical Warfare System*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Attack in a Minute	C/CPIF	General Dynamics : Pittsfield, MA	1.016	0.000		0.000		0.000		-		0.000	0.000	1.016	-
Cyber Security	C/CPAF	Progeny : Manassas, VA	1.750	0.000		0.000		0.000		-		0.000	0.000	1.750	-
WCS Code Modernization	C/CPIF	General Dynamics : Pittsfield, MA	1.056	0.000		0.000		0.000		-		0.000	0.000	1.056	-
APB5+	C/CPIF	General Dynamics : Pittsfield, MA	0.234	0.000		0.000		0.000		-		0.000	0.000	0.234	-
Common Infrastructure Services	C/CPIF	General Dynamics : Fairlakes, VA	1.800	0.000		0.000		0.000		-		0.000	0.000	1.800	-
Government Engineering	WR	NUWC : Newport, RI	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Combat System of the Future (CSOF)	Various	Various (Not specified) : Not Specified	1.300	0.000		0.000		0.000		-		0.000	0.000	1.300	-
Payload Control System (PCS)	C/CPAF	Progeny : Manassas, VA	1.422	0.000		0.000		0.000		-		0.000	0.000	1.422	-
Multi-Tube Weapon Simulator (MTWS)	C/CPFF	Progeny : Manassas, VA	0.144	0.000		0.000		0.000		-		0.000	0.000	0.144	-
Combat System Engineering	C/CPFF	Raytheon : Portsmouth, RI	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
UAV Development	Various	Defense Innovation Unit Experimental : Mountain View, CA	0.000	5.100	Mar 2018	0.000		0.000		-		0.000	0.000	5.100	-
Canister Development	Various	Sparton : DeLeon Springs, FL	0.000	1.600	Mar 2018	0.000		0.000		-		0.000	0.000	1.600	-
Government Engineering	WR	NUWC NPT : Newport, RI	0.000	2.004	Sep 2017	0.000		0.000		-		0.000	0.000	2.004	-
		Subtotal	9.172	8.704		0.000		0.000		-		0.000	0.000	17.876	N/A

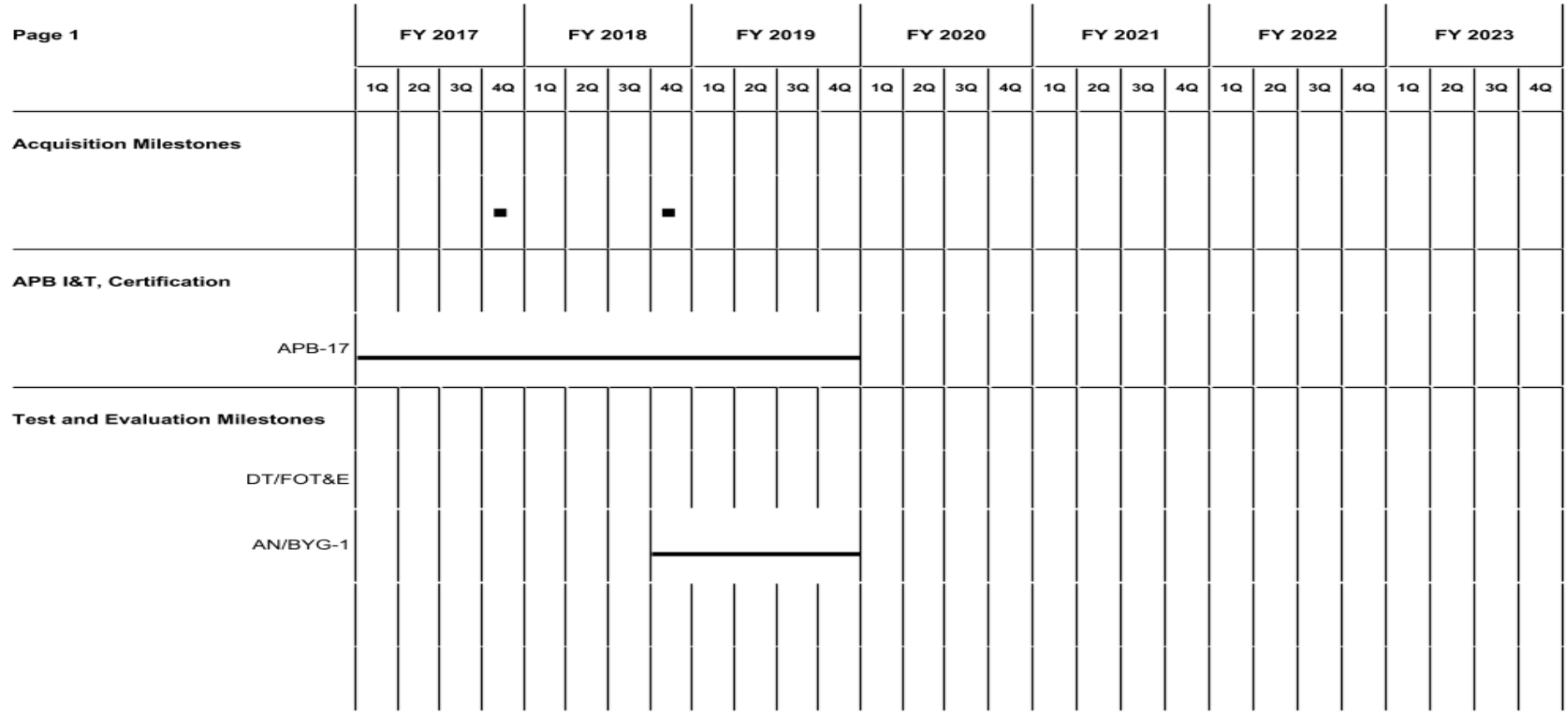
	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.172	8.704		0.000		0.000		-		0.000	0.000	17.876	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604562N / *Submarine Tactical Warfare System*	Project (Number/Name) 9999 / *Congressional Adds*	

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 9999 / *Congressional Adds*



2019DON - 0604562N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604562N / *Submarine Tactical Warfare System*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Page 1				
Acquisition Milestones: Annual MDA Program Review - FY17	4	2017	4	2017
Acquisition Milestones: Annual MDA Program Review - FY18	4	2018	4	2018
APB I&T, Certification: APB-17: APB-17	1	2017	4	2018
Test and Evaluation Milestones: AN/BYG-1: APB-17 DT/OT	4	2017	4	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	646.717	82.946	67.166	60.062	-	60.062	59.688	54.596	55.677	56.859	Continuing	Continuing
1803: *Ship Contract Design*	132.813	2.198	3.880	3.111	-	3.111	3.246	3.320	3.379	3.455	Continuing	Continuing
2465: *LHA(R) FLT Design and Total Ship Integration*	250.257	9.486	8.169	6.841	-	6.841	9.876	5.949	6.072	6.204	Continuing	Continuing
3108: *CVN 80 Total Ship Integration*	0.977	29.257	33.195	31.563	-	31.563	27.423	25.726	26.239	26.787	Continuing	Continuing
3179: *CVN-79 Total Ship Integration*	185.317	16.663	16.953	14.536	-	14.536	14.976	15.290	15.582	15.913	Continuing	Continuing
3369: *Hybrid Electric Drive*	11.531	1.691	0.986	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.208
3374: *MPF(F)*	0.000	0.679	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.679
4007: *CVN 21 LFT&E*	65.822	3.629	3.983	4.011	-	4.011	4.167	4.311	4.405	4.500	Continuing	Continuing
9999: *Congressional Adds*	0.000	19.343	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.343
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 333, 223												

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.598 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

This Program Element (PE) directly supports the Navy's Shipbuilding Plan by providing for the development of engineering, programmatic and acquisition documentation including ship specifications (including performance specifications) and contractual documentation associated with acquisition of Navy ships. This PE also supports the Congressionally mandated Live Fire Test and Evaluation (LFT&E) program for new ship designs.

Contract Design has traditionally been the engineering development of the technical and contractual definition of the ship design (including ship specifications and drawings) to a level of detail sufficient for shipbuilders to make a sound estimate of the construction cost and schedule. Additionally, the contract design package developed under this PE has provided the technical baseline from which the Navy selects the shipbuilder who then develops the detail design package required to support the construction and eventual delivery of the ship. This PE also supports the development of design methodologies/tools which facilitate and optimize the transition from ship design documents to efficient production of new ships and ship conversions, and supports engineering planning and ship affordability studies.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604567N *I Ship Contract Design/ Live Fire T&E*

Under Acquisition Reform for new design ships, traditional distinct phasing of the design process has been replaced with a continuous concurrent engineering Integrated Product and Process Development (IPPD) process extending through and after contract award. This serves to maintain the focus of multi-discipline teams consisting of the government,
shipbuilder, system programs, and suppliers. Government/Industry Integrated Product Team(s) (IPTs) will utilize the IPPD process to develop the design in an Integrated Product and Data Environment (IPDE). The design approach is part of an acquisition strategy that is based on commercial practices and incorporates a phased technical definition.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	63.311	67.166	69.618	-	69.618
Current President's Budget	82.946	67.166	60.062	-	60.062
Total Adjustments	19.635	0.000	-9.556	-	-9.556
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.055	0.000			
• Program Adjustments	1.691	0.000	-8.616	-	-8.616
• Rate/Misc Adjustments	-0.001	0.000	-0.940	-	-0.940
• Congressional Add Adjustments	20.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *CVN Cost Reduction Activities*	19.343	0.000
Congressional Add Subtotals for Project: 9999	19.343	0.000
Congressional Add Totals for all Projects	19.343	0.000

Change Summary Explanation

FY17:
PROJ 3369: Request for Additional Appropriations (RAA) FY 2017 source unused. Hybrid Electric Drive funds added back.
PROJ 9999: $19.343M added for CVN Cost Reduction Activities.

FY19:

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604567N *I Ship Contract Design/ Live Fire T&E*

PROJ 3369: Cancelled the Hybrid Electric Drive program. Funds removed from FY19 and FY20.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 1803 / *Ship Contract Design*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1803: *Ship Contract Design*	132.813	2.198	3.880	3.111	-	3.111	3.246	3.320	3.379	3.455	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

DDG Modernization:
The major effort is the engineering development of the technical and contractual definition of the ship's design (e.g. ship specifications and drawings), with sufficient details for the planning yard to make a sound estimate of cost and schedule. It also serves as the technical definition from which the planning yard develops the detailed design and testing package required to build and test the ship. It provides the Navy with a digital, ship design knowledge base, including lessons learned, required to ensure that a proper development, analysis and evaluation can be conducted of any current or future planned.

Another area this project funds is the development of specific Navy ship criteria and standards for newly developed technologies. Additionally, as new laws are passed, new safety regulations and environmental criteria are developed and other legal/Congressional requirements identified, this project funds the translation into Navy ship design criteria
and standards. This project also funds the translation of the traditional Ship Specifications into performance-based criteria, which supports the development of design methodologies/tools which facilitate and optimize the transition from ship design documents to ship alterations. This project also supports ship survivability studies, superstructure integrity analysis, developmental and operational testing, gun weapon system software integration and next generation Machinery Control System (MCS) software integration.

Expeditionary Sea Base (ESB) (formerly MLP AFSB)
Funds are for performance specification development, and Dynamic Interface Testing for various airframes as part of the ESB Special Operations Forces (SOF) Backfit.

Task Force Cyber Awareness (TFCA) - NAVSEA Boundary Defense Capability:
Computer security upgrades and mitigation for operating machinery, machinery controllers, and machinery control systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Ship Contract Design	2.198	2.238	3.111	0.000	3.111
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 1803 / *Ship Contract Design*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue ship design and alteration development for superstructure cracking/aluminum sensitization and HM&E network upgrades in CG's and for DDG 51 Flt IIA ship design to include development of structural reliability and other alterations to include machinery control systems improvements in FY 18. ***FY 2019 Base Plans:*** Continue ship design and alteration development for service life extension and HM&E network upgrades in CG's and for DDG 51 Flt IIA ship design to include development of structural reliability and other alterations to include machinery control systems improvements in FY 19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase associated with the Extended Service Life (ESL) studies for the CG Service Life Extension Program (SLEP).					
Title: ESB ***Articles:***	0.000 -	1.642 -	0.000 -	0.000 -	0.000 -
FY 2018 Plans: Complete ESB FOT&E. Complete ESB 3 final reporting for all test events pertaining to SOF efforts. Execute ESB 4 SOF PDT&T and complete final reporting. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 18 to FY 19 decrease reflects completion of ESB testing events.					
Accomplishments/Planned Programs Subtotals	2.198	3.880	3.111	0.000	3.111

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN 0900: *DDG Mod*	429.614	603.355	487.999	-	487.999	681.567	584.972	911.570	1,057.869	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 1803 / *Ship Contract Design*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN 0960: *CG Mod*	319.920	306.050	276.446	-	276.446	302.185	221.839	139.942	26.378	2.529	4,164.807

Remarks

D. Acquisition Strategy

Continuing systems and software development for both development models and production machinery control units at Land Based Engineering Sites.

E. Performance Metrics

CG:
Aluminum sensitization study to determine the lifetime until sensitization for aluminum alloys and stress and buckling analysis of the CG 47 Class ship structure, and develop proposed fatigue fixes in the high stress areas to produce a technical report with modifications or improvements to the ship that may be necessary to preclude cracking in the areas of concern. Evaluation of composite patch and development of composite patch installation procedures as a method for repairing cracks. Development of ultrasonic impact treatment guidance as a method for repairing cracks. Evaluation of different coating that can prevent cracking and different aluminum alloys that are sensitization resistant. Additionally, review and track distributed services margins, predict future system loads, develop technical reports and make recommendation to ensure reaching hull service life.

DDG Modernization:
Efforts for DDG Mod include design and development for next generation MCS software integration.

ESB:
Completion of Post PSA Certification Testing including Dynamic Interface Testing.

Task Force Cyber Awareness (TFCA):
NAVSEA Boundary Defense Capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 1803 / *Ship Contract Design*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CG Mod Electronics Systems Eng	C/CPAF	Lockheed : Martin, Moorestown, NJ	17.413	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DON Energy Initiative - OEM	C/FPIF	L-3 Maritime Systems : Leesburg, VA	34.857	0.000		0.000		0.000		-		0.000	0.000	34.857	-
DON Energy Initiative	WR	NSWC/SSES : Philadelphia, PA	3.629	0.000		0.000		0.000		-		0.000	0.000	3.629	-
Engineering Development and Design	Various	COTF/NAVAIR/ NSWCCD/ NSWCDD/NSWCPC/ NSWCPHD/ NSWCSSES : DC/ MD/PA/CA	1.085	0.000		0.000		0.000		-		0.000	0.000	1.085	-
Preliminary and Contract Design	C/FPIF	NASSCO : San Diego, CA	6.500	0.000		0.000		0.000		-		0.000	0.000	6.500	-
Hybrid Electric Drive	C/CPIF	L-3 Maritime Systems : Leesburg, VA	6.911	0.000		0.000		0.000		-		0.000	0.000	6.911	-
Hybrid Electric Drive	C/CPAF	Rolls Royce : Walpole, MA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Hybrid Electric Drive	C/CR	General Atomics : San Diego, CA	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	-
Hybrid Electric Drive	C/CPAF	Herren Engineering : Alexandria, VA	0.600	0.000		0.000		0.000		-		0.000	0.000	0.600	-
Hybrid Electric Drive	C/CPAF	Syntek : Arlington, VA	0.099	0.000		0.000		0.000		-		0.000	0.000	0.099	-
Hybrid Electric Drive	WR	NSWC/SSES : Philadelphia, PA	0.750	0.000		0.000		0.000		-		0.000	0.000	0.750	-
Hybrid Electric Drive	TBD	Not Specified : Not Specified	8.500	0.000		0.000		0.000		-		0.000	0.000	8.500	-
		Subtotal	80.484	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 1803 / *Ship Contract Design*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DDG/CGM Program / Engineering Spt	WR	NSWC/DD : Dahlgren, VA	4.376	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DDGM Program/ Engineering Spt	Various	SUPSHIP/BATH : Bath, ME	3.331	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DDG/CGM Program / Engineering Spt	C/CPAF	CSC/BAE : Hampton, VA	4.713	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DDG/CGM Program / Engineering Spt	WR	SPAWARSYSCEN : Charleston, SC	2.004	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CGM Program / Engineering Spt	WR	NRL : Washington, DC	0.617	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CGM Program / Engineering Spt	C/CPAF	JJMA/ALION : Washington, DC	2.947	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DDG/CGM Program / Engineering Spt	C/CPAF	Lockheed Martin : Moorestown, NJ	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
DDG/CGM Program / Engineering Spt	WR	NSWC/PHD : Port Hueneme, CA	2.889	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support	C/CPFF	CSC : Washington DC	0.085	0.000		0.000		0.000		-		0.000	0.000	0.085	-
CGM/DDG Program / Engineering Spt	WR	COMOPTEVFOR : Norfolk, VA	0.420	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DDGM/HED Program / Engineering Spt	WR	NSWC/SSES : Philadelphia, PA	4.900	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DDGM Program / Engineering Spt	WR	NSWC/SSES : Philadelphia, PA	4.455	0.227	Jan 2017	0.527	Jan 2018	0.733	Jan 2019	-		0.733	0.000	5.942	-
HED Program / Engineering Spt	WR	NSWC/SSES : Philadelphia, PA	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
HED	C/CPAF	L-3 Maritime Systems : Leesburg, VA	1.048	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CG Program / Engineering Spt	WR	NSWC/BETHESDA : Bethesda, MD	9.615	0.025	Jan 2017	0.329	Jan 2018	0.457	Jan 2019	-		0.457	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 1803 / *Ship Contract Design*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CG Program / Engineering Spt	Various	SUPSHIP/ PASCAGOULA : Pascagoula, MS	4.430	0.306	Aug 2017	0.180	Jun 2018	0.250	Jun 2019	-		0.250	Continuing	Continuing	Continuing
CG Program / Engineering Spt	WR	NSWC/SSES : Philadelphia, PA	0.341	0.340	Jan 2017	0.880	Jan 2018	1.223	Jan 2019	-		1.223	0.000	2.784	-
DDG/CGM Program / Engineering Spt	C/CPFF	John Hopkins University : Laurel, MD	0.000	1.300	Apr 2017	0.322	Apr 2018	0.448	Apr 2019	-		0.448	0.000	2.070	-
ESB	Various	TBD : TBD	3.663	0.000		1.642	Jan 2018	0.000		-		0.000	0.000	5.305	-
NAVSEA Boundary Defense Capability	Various	TBD : TBD	1.995	0.000		0.000		0.000		-		0.000	0.000	1.995	-
		Subtotal	52.329	2.198		3.880		3.111		-		3.111	Continuing	Continuing	N/A

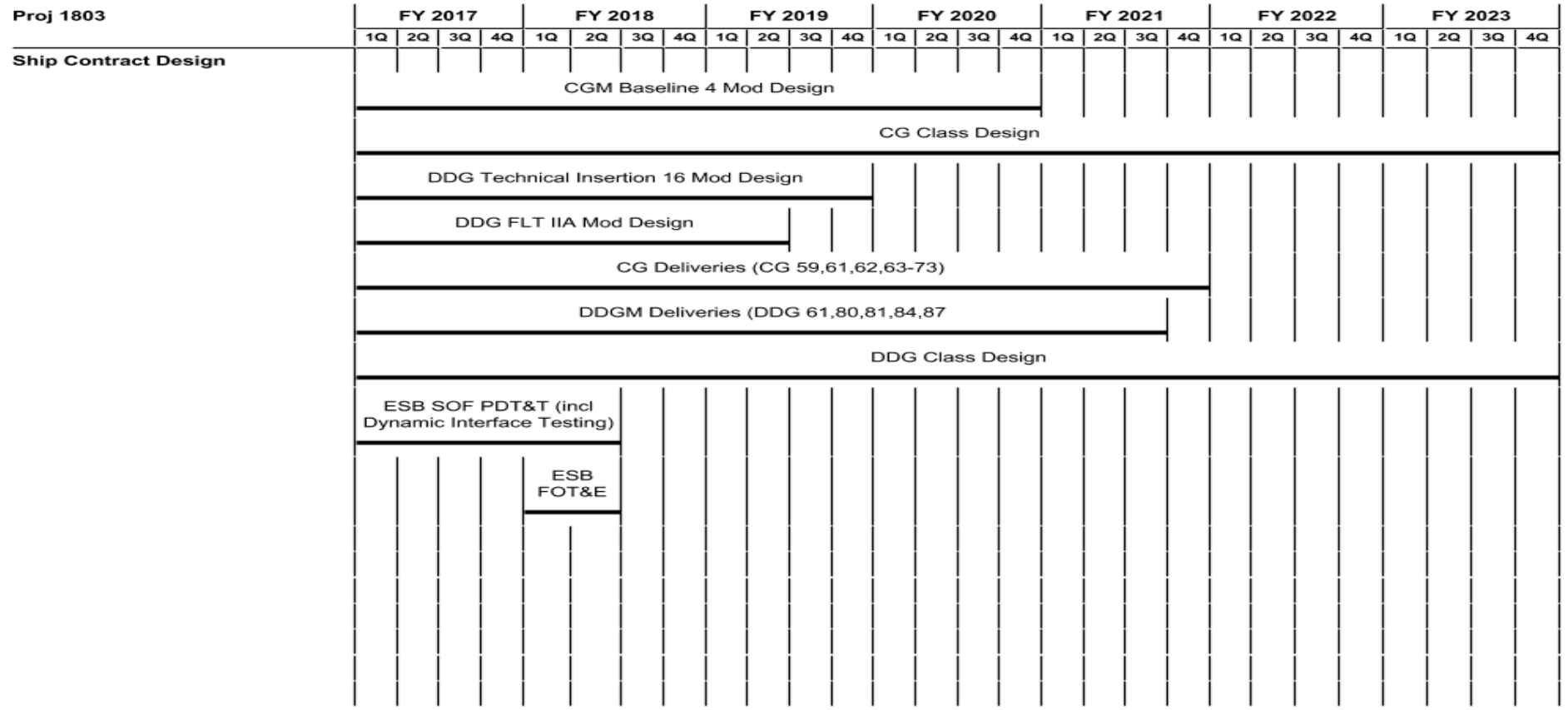
Remarks

Award dates for ESB reflects initial date of incremental funding execution in support of ESB SOF MOD backfit efforts.

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	132.813	2.198		3.880		3.111		-		3.111	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 1803 / *Ship Contract Design*



2019PB - 0604567N - 1803

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 1803 / *Ship Contract Design*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1803				
Ship Contract Design: CGM Baseline 4 Mod Design	1	2017	4	2020
Ship Contract Design: CG Class Design	1	2017	4	2023
Ship Contract Design: DDG Technical Insertion 16 Mod Design	1	2017	4	2019
Ship Contract Design: DDG FLT IIA Mod Design	1	2017	2	2019
Ship Contract Design: CG Deliveries (CG 59,61,62,63-73)	1	2017	4	2021
Ship Contract Design: DDGM Deliveries (DDG 61,80,81,84,87)	1	2017	3	2021
Ship Contract Design: DDG Class Design	1	2017	4	2023
Ship Contract Design: ESB SOF PDT&T (incl Dynamic Interface Testing)	1	2017	2	2018
Ship Contract Design: ESB FOT&E	1	2018	2	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 2465 / *LHA(R) FLT Design and Total Ship Integration*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2465: *LHA(R) FLT Design and Total Ship Integration*	250.257	9.486	8.169	6.841	-	6.841	9.876	5.949	6.072	6.204	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 333

A. Mission Description and Budget Item Justification

This project provides the contract design, development and testing efforts for the Amphibious Assault Ship Replacement Program LHA(R). This project provides the contract design, development and testing efforts for the Amphibious Assault Ship Replacement Program LHA(R). The LHA(R) is a ship construction program designed to: (1) provide a functional replacement for the Amphibious Assault Ships which reached the end of their extended service lives (2) be a key platform in the Amphibious Readiness Group (ARG) of the future and (3) provide for an affordable and sustainable amphibious ship development program. LHA(R) ships will provide forward presence and power projection as an integral part of Joint, inter-agency, and multi-national maritime expeditionary forces. Additionally, LHA(R) will be designed to operate for sustained periods in transit to and operations in an Amphibious Objective Area to include the embarkation, deployment, and landing of a Marine Landing Force in an assault by helicopters and tilt rotors (MV-22) supported by Joint Strike Fighters (F-35B).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: LHA (R) FLT 0 Design and Total Ship Integration - LHA 6	7.022	1.295	1.064	0.000	1.064
Articles:	-	-	-	-	-
FY 2018 Plans: LHA 6 Complete Final Vulnerability Assessment Report (VAR). LHA 6 Complete Operational Test and Evaluation (OT&E). LHA 6 Continue LHA Class Reliability Maintainability and Availability (RMA).					
FY 2019 Base Plans: - LHA 6 Complete LHA Class Reliability Maintainability and Availability (RMA).					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 2465 / *LHA(R) FLT Design and Total Ship Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
****Note - Decrease from FY 2018 to FY 2019 is a result of planned completion of the Final Vulnerability Assessment Report (VAR) in FY18 Q3. As well as the shifting of the Follow-on Operational Test and Evaluation from FY 2019 to FY 2020.					
Title: LHA (R) FLT 1 Design and Total Ship Integration - LHA 8	2.464	6.874	5.777	0.000	5.777
Articles:	-	-	-	-	-
FY 2018 Plans: LHA 8 Continue Vulnerability Assessment Report (VAR). LHA 8 Continue Enterprise Air Search Radar (EASR) integration efforts. LHA 8 Continue Operational Test & Evaluation preparation for Operational Assessment (OA).					
FY 2019 Base Plans: LHA 8 Initiate Reliability Maintainability Availability (RMA) analysis. LHA 8 Continue Vulnerability Assessment Report (VAR). LHA 8 Continue Enterprise Air Search Radar (EASR) integration efforts. LHA 8 Continue Operational Test & Evaluation preparation for Operational Assessment (OA).					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease from FY18 to FY19 is a result of reduced requirements in the Live Fire Test and Evaluation (LFT&E) for the Enterprise Air Search Radar (EASR) Land Based Test System, and planned reductions in Verification, Validation & Accreditation (VV&A) and Vulnerability Assessment Report (VAR) efforts in the LHA 8 FLT1.					
Accomplishments/Planned Programs Subtotals	9.486	8.169	6.841	0.000	6.841

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/3041: *LHA (R) Ships*	1,617.719	1,725.127	25.100	-	25.100	0.000	0.000	0.000	191.892	0.000	10,482.184

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 2465 / *LHA(R) FLT Design and Total Ship Integration*

D. Acquisition Strategy

LHA 6 Advanced Procurement and Long Lead Time Material was awarded on a sole source basis to Huntington Ingalls Inc., formerly Northrop Grumman Shipbuilding, on 15 July 2005; LHA 6 Detail Design and Construction (DD&C) was awarded on 1 June 2007. The Advance Procurement and Long Lead Time Material efforts were subsumed by the Fixed Price Incentive, Firm Target DD&C contract.

LHA 7 Advanced Procurement and Long Lead Time Material was awarded on a sole source basis to Huntington Ingalls Inc., formerly Northrop Grumman Shipbuilding, on 30 June 2010; LHA 7 DD&C was awarded on 31 May 2012. The Advanced Procurement and Long Lead Time Material efforts were subsumed by the Fixed Price Incentive, Firm Target DD&C contract.

LHA 8 Planning, Advanced Engineering and Procurement of Long Lead Time Material (LLTM) for an LHA Replacement (LHA(R)) Flight 1 Amphibious Assault Ship was awarded on a competitive basis to Huntington Ingalls Inc. on 30 June 2016. The option for LHA 8 Detail Design and Construction was awarded on 16 June 2017. The Planning, Advanced Engineering and Procurement of Long Lead Time Material (LLTM) efforts were subsumed into this Fixed Price Incentive, Firm Target DD&C contract option.

LHA 9 Acquisition Strategy is under review.

E. Performance Metrics

Successfully achieve Initial Operational Capability, successfully complete Operational Test and Milestone Reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 2465 / *LHA(R) FLT Design and Total Ship Integration*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Design	WR	NSWC : Various	97.905	0.000		0.000		0.000		-		0.000	0.000	97.905	-
Ship Design	C/CPFF	HII : Pascagoula, MS	5.009	0.000		0.000		0.000		-		0.000	0.000	5.009	-
Ship Design	C/CPFF	Various : Various	44.087	0.000		0.000		0.000		-		0.000	0.000	44.087	-
Special Studies	WR	NSWC : Panama City, FL	4.800	0.000		0.000		0.000		-		0.000	0.000	4.800	-
		Subtotal	151.801	0.000		0.000		0.000		-		0.000	0.000	151.801	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services	Various	NSWC : Various	0.000	2.300	Dec 2016	4.251	Dec 2017	3.316	Dec 2018	-		3.316	Continuing	Continuing	Continuing
		Subtotal	0.000	2.300		4.251		3.316		-		3.316	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	MIPR	JITC : Fort Huachuca, AZ	4.409	0.150	Dec 2016	0.000		0.000		-		0.000	0.000	4.559	-
Operational Test & Evaluation	WR	OPTEVFOR/ MCOTEA/NAVSUP : Norfolk, VA/ Quantico, VA	17.978	3.403	Dec 2016	1.045	Dec 2017	1.029	Dec 2018	-		1.029	Continuing	Continuing	Continuing
Live Fire Test & Evaluation	WR	NSWC : Various	59.125	3.547	Dec 2016	2.785	Dec 2017	2.408	Dec 2018	-		2.408	Continuing	Continuing	Continuing
Follow-on Operational Test and Evaluation	WR	OPTEVFOR / MCOTEA : Norfolk, VA / Quantico, VA	0.000	0.000		0.000		0.000	Dec 2018	-		0.000	0.000	0.000	-
		Subtotal	81.512	7.100		3.830		3.437		-		3.437	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 2465 / *LHA(R) FLT Design and Total Ship Integration*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	C/CPFF	Various : Various	16.201	0.046	Dec 2016	0.068	Dec 2017	0.083	Dec 2018	-		0.083	Continuing	Continuing	Continuing
Travel	Various	Navsea Travel : Washington, DC	0.732	0.040	Dec 2016	0.020	Dec 2017	0.005	Dec 2018	-		0.005	Continuing	Continuing	Continuing
Defense Acquisition Workforce	Various	Various : Various	0.011	0.000		0.000		0.000		-		0.000	0.000	0.011	-
		Subtotal	16.944	0.086		0.088		0.088		-		0.088	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	250.257	9.486		8.169		6.841		-		6.841	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 2465 / *LHA(R) FLT Design and Total Ship Integration*

LHA Replacement Design and Total Ship Integration

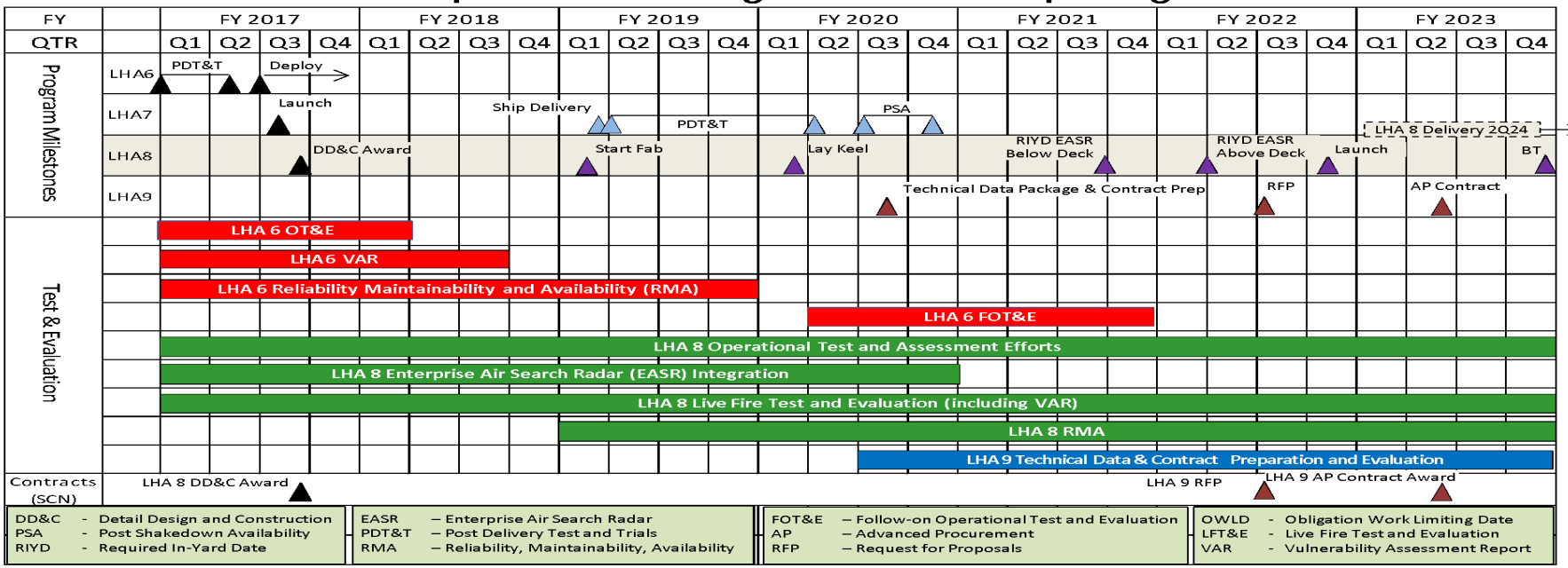


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 2465 / *LHA(R) FLT Design and Total Ship Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2465				
LHA 6 Reliability Maintainability and Availability (RMA)	1	2017	4	2019
LHA 8 Enterprise Air Search Radar (EASR) Integration	1	2017	4	2020
LHA 8 Reliability Maintainability and Availability (RMA)	1	2019	4	2023
LHA 8 Vulnerability Assessment Report	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 3108 / *CVN 80 Total Ship Integration*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3108: *CVN 80 Total Ship Integration*	0.977	29.257	33.195	31.563	-	31.563	27.423	25.726	26.239	26.787	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 223

A. Mission Description and Budget Item Justification

Development and related testing of CVN 78 Class aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project also funds the Contract Design efforts for the CVN 80. This project transitions the minimum sustaining technologies required to address obsolescence, critical survivability shortfalls as identified in CVN 78 Class testing, future requirements, and technologies which did not mature in time to support the CVN 78 or CVN 79. All systems developed in this project have the potential to support emerging requirements and other promising system technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, warfare systems, and combat support systems, sub-systems and components to maintain aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to support CVN 80 procurement, including, but not limited to engineering support, programmatic and program support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Enterprise Radar Suite (ERS)	8.255	9.265	8.620	0.000	8.620
Articles:	-	-	-	-	-
FY 2018 Plans: Continue conducting / preparing risk reduction studies / reports, to include management of a risk / opportunity database to support future-decision making. Continue conducting technology assessment studies. Continue execution of Requirements Engineering and Architecture, including maintaining a radar specification traceability matrix to the CVN ORD and maintenance of a new CVN Warfare System architecture. Continue to conduct ship integration studies for Government Furnished Information (GFI) vetting, tracking and delivery. Continue conducting onboard and off-board Electromagnetic Interference / Control (EMI / EMC) studies due to new the radar sensor. Continue analyzing / performing integrated topside design due to new radar sensor. Continue conducting power interface trade studies based upon radar prime power requirement and conduct trade studies to analyze platform power against transformer design and platform power against cost of ship modification. Continue conducting system integration studies related to the TEMP: platform impacts & updates to the Test					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3108 / *CVN 80 Total Ship Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
& Evaluation Master Plan (TEMP); cybersecurity analysis; Information Support Plan (ISP) updates supporting Net Ready Key Performance Parameter (KPP). Continue conducting Reliability, Maintainability and Availability (RMA) and integrated logistics support (ILS) studies, to include trade studies and identification of investment opportunities / requirements. Continue preparing / updating acquisition support documents and cost estimates. Continue operation of the Integrated Product Team to include vendor, shipbuilder and Government. Participate in Preliminary Design Review. ***FY 2019 Base Plans:*** Continue conducting / preparing risk reduction studies / reports, to include management of a risk / opportunity database to support decision making. Continue conducting technology assessment studies. Continue execution of Requirements Engineering and Architecture, including maintaining a radar specification traceability matrix to the CVN ORD and maintenance of a new CVN Warfare System architecture. Continue to conduct ship integration studies for GFI vetting, tracking and delivery. Continue conducting onboard and off-board Electromagnetic Interference / Control (EMI / EMC) studies due to new the radar sensor suite. Continue analyzing / performing integrated topside design due to new radar sensor suite. Continue conducting power interface trade studies based upon radar prime power requirement and conduct trade studies to analyze platform power against transformer design and platform power against cost of ship modification. Continue conducting system integration studies related to the TEMP; platform impacts & updates to TEMP; cybersecurity analysis; and ISP updates supporting Net Ready KPP. Continue conducting RMA and ILS studies, to include trade studies and identification of investment opportunities / requirements. Continue preparing / updating acquisition support documents and cost estimates. Continue operation of the Integrated Product Team to include vendor, ship builder and Government. Participate in Preliminary and Critical Design Reviews of Warfare System elements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to service wide funding adjustments.					
Title: CVN 78 Class Design for Affordability (DFA)	21.002	23.930	22.943	0.000	22.943
Articles:	-	-	-	-	-
FY 2018 Plans: Continue conducting or supporting feasibility and tradeoff studies on new and modified shipboard systems and equipment. Continue to discover and assess CVN 78 Class DFA initiatives. Continue development of cost-saving initiatives, game changers, business case analyses, and DFA initiatives to continue to drive affordability					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3108 / *CVN 80 Total Ship Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
into the carrier program. Continue performing CVN 80-specific engineering calculations and technical analysis in the areas of technical performance measures; system component calculations; environmental safety and health, and human factors engineering; survivability and vulnerability; automation systems software; shock and vibration; and engineered components support. ***FY 2019 Base Plans:*** Continue conducting or supporting feasibility and tradeoff studies on new and modified shipboard systems and equipment. Continue to discover and assess CVN 78 Class DFA initiatives. Continue development of cost-saving initiatives, game changers, business case analyses, and DFA initiatives to continue to drive affordability into the carrier program. Continue performing CVN 80-specific engineering calculations and technical analysis in the areas of technical performance measures; system component calculations; environmental safety and health, and human factors engineering; survivability and vulnerability; automation systems software; shock and vibration; and engineered components support. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to planned phasing of work efforts.					
Accomplishments/Planned Programs Subtotals	29.257	33.195	31.563	0.000	31.563

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN / 2001: *Carrier Replacement Program*	2,626.567	4,441.772	1,598.181	-	1,598.181	2,146.535	3,239.606	2,910.491	3,378.355	10,602.689	50,900.224
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	0.000	20.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,394.860
• RDTEN / 0604112N: *Project Units 2208, 4004, C295*	69.184	83.935	58.121	-	58.121	57.236	43.713	30.904	39.306	Continuing	Continuing
• OMN / 1B2B: *CVN 78 Ford Class Training and Sustainment (12BJ0)*	17.536	14.008	9.043	-	9.043	8.150	6.346	6.907	7.054	Continuing	Continuing
• RDTEN / 0604501N: *Project Unit 3236 Advanced Radar Technology*	53.331	68.665	25.257	-	25.257	2.141	0.000	0.000	0.000	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3108 / *CVN 80 Total Ship Integration*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN / 5664: *Surface Training Equipment*	4.490	12.010	7.942	-	7.942	0.994	4.965	2.964	3.023	Continuing	Continuing
• OMN / 1B1B: *Mission and Other Ship Operations (11B30)*	24.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.000

Remarks

D. Acquisition Strategy

The CVN 80 is the third ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class Carriers. The CVN 80 is a modified repeat of the CVN 78, which features a new nuclear propulsion and electrical generation / distribution system, electromagnetic aircraft launching system, advanced arresting gear system, electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war-fighting benefits will be realized: increased sortie generation rate, improved ship self defense capability, increased launch and recovery capability / flexibility, increased operational availability, and increased flexibility to support future upgrades.

CVN 80 will use late integration of Government-Furnished Equipment to provide the latest combat system and C4I suite applications within the planned system baseline. CVN 80 will improve upon processes used on CVN 78 and CVN 79 to gain efficiencies during the CVN 80 Construction Preparation and Construction periods.

E. Performance Metrics

Successfully initiate the following tasks: 1) Development of risk impact statements, 2) Radar specification and traceability to test documents, 3) Development and maintenance of new CVN Warfare System architecture database, and 4) Development of FORD Class affordability initiatives to incorporate into the CVN 80 design and CVN 79 production as applicable.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 3108 / *CVN 80 Total Ship Integration*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Advanced Design & Development	C/CPAF	HII : VA	0.300	17.254	Nov 2016	17.044	Nov 2017	17.540	Nov 2018	-		17.540	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPFF	GRYPHON (SEI&T) : IN	0.000	3.910	Nov 2016	0.000		2.500	Nov 2018	-		2.500	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC DAHLGREN : VA	0.151	2.536	Nov 2016	5.125	Nov 2017	3.700	Nov 2018	-		3.700	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC CARDEROCK : MD	0.000	1.485	Nov 2016	2.750	Nov 2017	1.200	Nov 2018	-		1.200	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NSWC PHILADELPHIA : PA	0.000	0.000		1.125	Nov 2017	0.500	Nov 2018	-		0.500	Continuing	Continuing	Continuing
Advanced Design & Development	C/CPFF	NAVSEA SEAPORT : DC	0.000	2.162	Nov 2016	3.000	Jan 2018	2.353	Dec 2018	-		2.353	Continuing	Continuing	Continuing
Advanced Design & Development	C/BA	NAWCAD PAX RIVER : MD	0.000	0.806	Nov 2016	0.500	Nov 2017	1.305	Nov 2018	-		1.305	Continuing	Continuing	Continuing
Advanced Design & Development	WR	NAWCAD LAKEHURST : NJ	0.313	0.000		0.000		0.000		-		0.000	0.000	0.313	-
Advanced Design & Development	WR	SPAWAR : CA	0.190	0.000		0.500	Nov 2017	0.490	Nov 2018	-		0.490	Continuing	Continuing	Continuing
Advanced Design & Development	Various	NSRP : VARIOUS	0.000	0.000		0.835	Dec 2017	0.835	Dec 2018	-		0.835	Continuing	Continuing	Continuing
Advanced Design & Development	Various	MISCELLANEOUS : VARIOUS	0.023	1.104	Nov 2016	2.316	Nov 2017	1.140	Nov 2018	-		1.140	Continuing	Continuing	Continuing
		Subtotal	0.977	29.257		33.195		31.563		-		31.563	Continuing	Continuing	N/A

Remarks

-- HII will continue to further identify Design for Affordability opportunities to decrease the CVN 78 class ship construction acquisition cost and facilitate implementation of developed processes and tools. HII will also continue to support the research of Enterprise Radar Suite (ERS) topside integration efforts.
-- The System Engineering, Integration, and Test contractor is now Gryphon, Inc. This function was previously served by Raytheon. Gryphon will be conducting analysis and development support for the warfare system architecture design and integration efforts as well as ERS integration efforts.
-- NAWCAD Pax River will be conducting analysis and support for the TPX-42 and Identification Friend or Foe (IFF) architecture design and integration efforts to support the new Enterprise Air Surveillance Radar (EASR) system.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 3108 / *CVN 80 Total Ship Integration*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.977	29.257		33.195		31.563		-		31.563	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3108 / *CVN 80 Total Ship Integration*

Gerald R. Ford Class Carriers

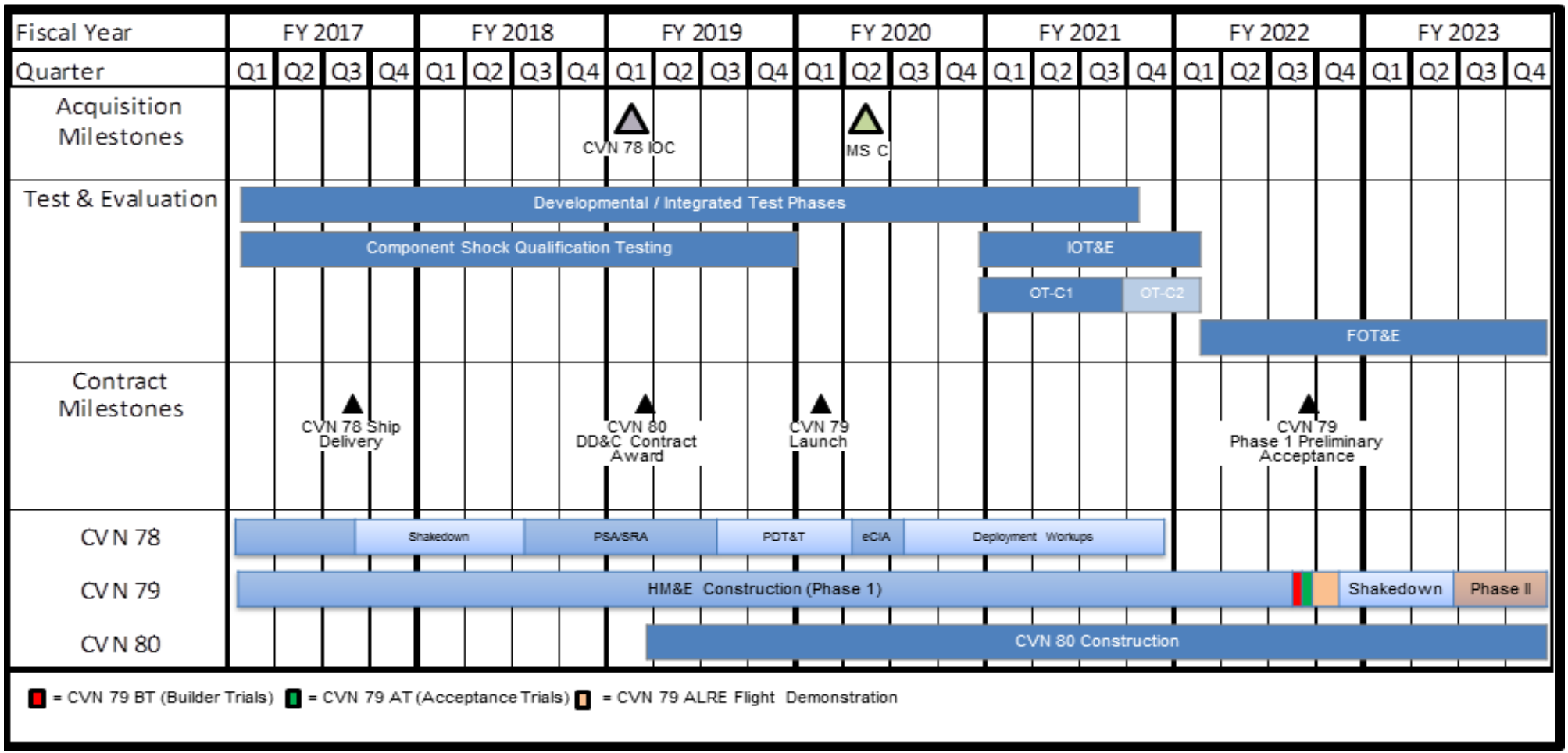


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3108 / *CVN 80 Total Ship Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3108				
Initial Operational Capability	1	2019	1	2019
Milestone C	2	2020	2	2020
Component Shock Qualification Testing	1	2017	4	2019
Initial Operational Test & Evaluation	4	2020	1	2022
CVN 80 Construction Contract Award	1	2019	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 3179 / *CVN-79 Total Ship Integration*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3179: *CVN-79 Total Ship Integration*	185.317	16.663	16.953	14.536	-	14.536	14.976	15.290	15.582	15.913	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 223

A. Mission Description and Budget Item Justification

Development and related testing of CVN 78 Class aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project also funds the Contract Design efforts for the CVN 79. This project transitions the minimum sustaining technologies required to address obsolescence, critical survivability shortfalls as identified in CVN 78 Class testing, future requirements, and technologies which did not mature in time to support the CVN 78. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, warfare systems, and combat support systems, sub-systems and components to maintain aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to develop the contract data package necessary to support CVN 79 procurement, including, but not limited to, engineering support, programmatic and program support, logistics support, modeling and simulation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment. In addition, this project focuses on significant procurement and life cycle cost reduction compared to the first ship of the class. Cost reductions are sought, developed and implemented in the areas of design, labor and material.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CVN-79 Total Ship Integration	16.663	16.953	14.536	0.000	14.536
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to address design, equipment and system changes between CVN 78 and CVN 79 to identify candidate equipment and/or systems that may require FOT&E. Continue to address design and construction issues based on the results of CVN 78 testing. Continue to manage fact-of-life, obsolescence changes on government furnished equipment systems, challenges encountered on CFE, and material analysis. Perform throughput analysis on Facility investments (Shop Lathe, Panel Line, Weather Covers, Outfitting Hall & Dry Dock)and Non-Touch Labor to solidify cost improvements. Continue CVN 79 Phase II study to develop a strategy to efficiently transition from Phase I construction to Phase II and final delivery of CVN 79.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3179 / *CVN-79 Total Ship Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue to address design, equipment and system changes between CVN 78 and CVN 79 to identify candidate equipment and / or systems that may require FOT&E. Continue to address design and construction issues based on the results of CVN 78 testing and initial operations. Continue to manage fact-of-life obsolescence changes on government-furnished equipment systems, challenges encountered on contractor-furnished equipment and material analysis. Continue to perform throughput analysis on Facility investments (Shop Lathe, Panel Line, Weather Covers, Outfitting Hall & Dry Dock) and Non-Touch Labor to solidify cost improvements. Continue CVN 79 Phase II study to develop and refine the strategy to efficiently transition from Phase I construction to Phase II and final delivery of CVN 79. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to service wide funding adjustments.					
Accomplishments/Planned Programs Subtotals	16.663	16.953	14.536	0.000	14.536

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN / 2001: *Carrier Replacement Program*	2,626.567	4,441.772	1,598.181	-	1,598.181	2,146.535	3,239.606	2,910.491	3,378.355	10,602.689	50,900.224
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	0.000	20.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,394.860
• RDTEN / 0604112N: *Project Units 2208, 4004*	69.184	83.935	58.121	-	58.121	57.236	43.713	30.904	39.306	Continuing	Continuing
• OMN / 1B2B: *CVN 78 Ford Class Training and Sustainment (12BJ0)*	17.536	14.008	9.043	-	9.043	8.150	6.346	6.907	7.054	Continuing	Continuing
• OPN / 5664: *Surface Training Equipment*	4.490	12.010	7.942	-	7.942	0.994	4.965	2.964	3.023	Continuing	Continuing
• OMN / 1B1B: *Mission and Other Ship Operations (11B30)*	24.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.000

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3179 / *CVN-79 Total Ship Integration*

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 class will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability / flexibility, increased operational availability, and increased flexibility to support future upgrades.

E. Performance Metrics

Successfully complete system development efforts for designated new and modified shipboard system, including developmental test and evaluation documents. Successfully complete design related activities associated with integration of new and modified shipboard systems into the ship, including developmental test and evaluation documentation. Successfully perform system design and analysis studies. Successfully support design integration and analysis. Successfully complete or support feasibility and tradeoff studies on new and modified shipboard systems, technologies, and proposed modifications. Studies shall include requirements and engineering analysis; identification of subsystem, integration, and logistics impacts; cost estimates; analysis of construction schedule impacts; and conduct / support of shipchecks. Successfully provide Manpower Workload Analysis associated with design and policy activities, and with integration of new and modified system/equipment. Successfully complete the development of multiple Business Case Analyses (BCAs) that demonstrate technology, process, requirements and / or infrastructure improvements that will reduce the man hours (or equivalent material costs) for CVN 79 Construction.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3179 / *CVN-79 Total Ship Integration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Total Ship Integration	C/CPAF	HII : VA	91.421	6.215	Nov 2016	7.480	Nov 2017	2.094	Nov 2018	-		2.094	Continuing	Continuing	Continuing
Total Ship Integration	WR	NSWC CARDEROCK : MD	14.713	0.200	Nov 2016	0.616	Nov 2017	1.170	Nov 2018	-		1.170	Continuing	Continuing	Continuing
Total Ship Integration	WR	NSWC DAHLGREN : VA	12.207	1.700	Oct 2016	2.273	Nov 2017	2.627	Nov 2018	-		2.627	Continuing	Continuing	Continuing
Total Ship Integration	WR	NSWC PHILADELPHIA : PA	1.131	0.000		0.625	Nov 2017	1.170	Nov 2018	-		1.170	Continuing	Continuing	Continuing
Total Ship Integration	WR	NAWCAD PAX RIVER : MD	5.527	1.268	Oct 2016	0.750	Oct 2017	1.153	Nov 2018	-		1.153	Continuing	Continuing	Continuing
Total Ship Integration	WR	SPAWAR : SD	4.491	0.300	Nov 2016	0.295	Nov 2017	0.749	Nov 2018	-		0.749	Continuing	Continuing	Continuing
Total Ship Integration	C/CPFF	NAVSEA SEAPORT : DC	24.032	1.950	Dec 2016	2.159	Dec 2017	2.467	Dec 2018	-		2.467	Continuing	Continuing	Continuing
Total Ship Integration	C/CPAF	RAYTHEON : MA	9.783	1.815	Dec 2016	1.000	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Total Ship Integration	WR	SSC CHARLESTON : SC	0.847	0.000		0.000		0.000		-		0.000	0.000	0.847	-
Total Ship Integration	C/CPFF	SAIC : VA	1.445	0.000		0.000		0.000		-		0.000	0.000	1.445	-
Total Ship Integration	Various	NSRP : Various	13.926	1.670	Dec 2016	0.835	Dec 2017	0.835	Dec 2018	-		0.835	Continuing	Continuing	Continuing
Total Ship Integration	C/CPFF	GRYPHON (SEI&T) : VA	0.000	0.000		0.000		0.780	Dec 2018	-		0.780	Continuing	Continuing	Continuing
		Subtotal	179.523	15.118		16.033		13.045		-		13.045	Continuing	Continuing	N/A

Remarks

-- The System Engineering, Integration, and Test contractor is now Gryphon, Inc. This function was previously served by Raytheon. The Gryphon team will be conducting analysis and development support for the warfare system architecture design and integration efforts. It will also address obsolescence issues, critical survivability shortfalls as identified in CVN 78 Class testing and future requirements and technologies.

-- Cost growth for NSWC Carderock and NSWC Philadelphia are due to addressing issues as a result of CVN 78 testing and initial operations.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3179 / *CVN-79 Total Ship Integration*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC CARDEROCK : MD	4.721	0.000		0.000		0.000		-		0.000	0.000	4.721	-
Developmental Test & Evaluation	WR	NUWC NEWPORT : RI	0.123	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NSWC DAHLGREN : VA	0.576	1.188	Nov 2016	0.569	Nov 2017	1.137	Nov 2018	-		1.137	Continuing	Continuing	Continuing
Developmental Test & Evaluation	TBD	MISCELLANEOUS : TBD	0.017	0.127	Nov 2016	0.125	Dec 2017	0.124	Dec 2018	-		0.124	Continuing	Continuing	Continuing
Operational Test & Evaluation	C/CPFF	FLC : VA	0.176	0.230	Dec 2016	0.226	Nov 2017	0.230	Nov 2018	-		0.230	Continuing	Continuing	Continuing
		Subtotal	5.613	1.545		0.920		1.491		-		1.491	Continuing	Continuing	N/A

Remarks

-- Cost growth for NSWC Dahlgren is due to increased T&E cyber-security efforts for CVN 79.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Acquisition Workforce	Various	Various : Misc	0.181	0.000		0.000		0.000		-		0.000	0.000	0.181	-
		Subtotal	0.181	0.000		0.000		0.000		-		0.000	0.000	0.181	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	185.317	16.663		16.953		14.536		-		14.536	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3179 / *CVN-79 Total Ship Integration*

Gerald R. Ford Class Carriers

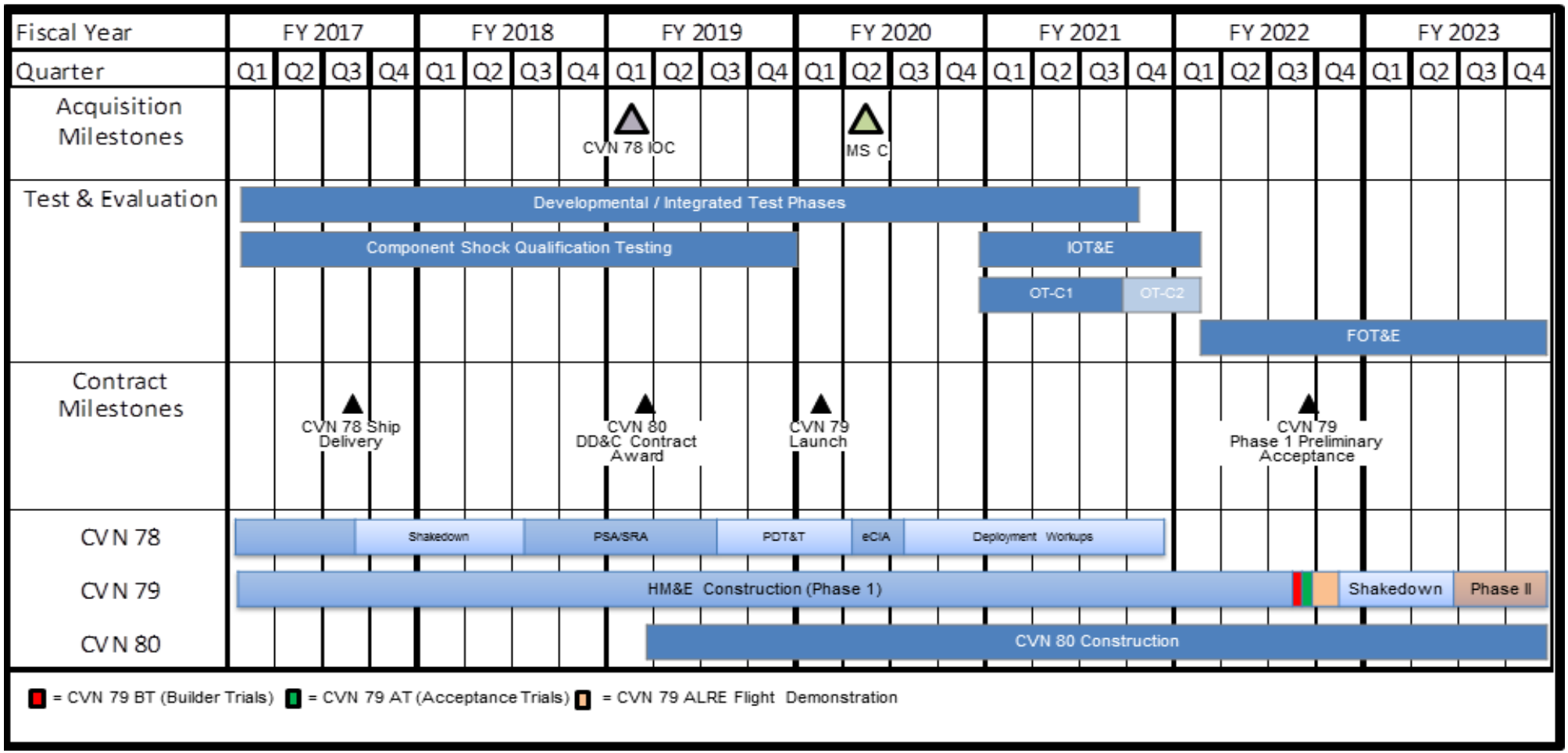


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3179 / *CVN-79 Total Ship Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3179				
Initial Operational Capability	1	2019	1	2019
Milestone C	2	2020	2	2020
Component Shock Qualification Testing	1	2017	4	2019
Initial Operational Test & Evaluation	4	2020	1	2022
CVN 80 Construction Contract Award	1	2019	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 3369 / *Hybrid Electric Drive*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3369: *Hybrid Electric Drive*	11.531	1.691	0.986	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.208
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project includes the DON Energy Initiative related to the DDG 51 Hybrid Electric Drive to reduce DDG 51 Class ship energy consumption and increase mission effectiveness through longer time on station. This project supports propulsion at low ship speeds without the need for LM 2500 main engines. Fuel savings from the Hybrid Electric Drive system will be achieved by utilizing fewer gas turbines for propulsion and ship service power generation while also loading gas turbines generators at a more efficient operating load. Provides critical foundation for SECNAV and CNO objectives to achieve greater Navy-wide energy security. The HED program has been truncated to two installations. The operational data collected from the two ships from a deployment cycle (usage/energy savings/efficiencies) will determine future installations.

Note: FY 2014 and prior year funding is resourced under project 1803 in this program element.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: DON Energy Initiative	1.691	0.986	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: This project is a DON Energy Initiative related to the DDG 51 Hybrid Electric Drive (HED) to reduce DDG 51 Class ship energy consumption and increase mission effectiveness through longer time on station. ***FY 2018 Plans:*** Develop and test additional MCS software baselines. ***FY 2019 Base Plans:*** Program has been cancelled. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 18 to FY 19 decrease reflects cancellation of efforts after FY 18.					
Accomplishments/Planned Programs Subtotals	1.691	0.986	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3369 / *Hybrid Electric Drive*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN 0140: *Hybrid Electric Drive (HED)*	10.983	6.331	0.000	-	0.000	0.000	0.000	0.000	0.000	46.585	105.643

Remarks

D. Acquisition Strategy

The HED program has been truncated to two installations. The operational data collected from the two ships from a deployment cycle (usage/energy savings/ efficiencies) will determine future installations.

E. Performance Metrics

Completion of Engineering Development Model (EDM) and complete fielding of First Article (FA) including contract award, design, manufacturing, and delivery. Completion of Factory Acceptance Test (FAT) and performance testing in Land Based Engineering Site (LBES). Commencement, completion, delivery and installation of Low Rate Initial Production (LRIP) units. Achieve fuel efficiency and increase on-station time.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 3369 / *Hybrid Electric Drive*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DON Energy Initiave - OEM	C/FPIF	L-3 Maritime Systems : Leesburg, VA	3.137	0.000	Jan 2017	0.286	Jan 2018	0.000		-		0.000	0.000	3.423	-
		Subtotal	3.137	0.000		0.286		0.000		-		0.000	0.000	3.423	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HED - DON Energy Initiative -OEM	WR	NSWC/SSES : Philadelphia, PA	7.769	1.691	Dec 2016	0.700	Dec 2017	0.000		-		0.000	0.000	10.160	-
HED - DON Energy Initiative -OEM	Various	SUPSHIP BATH : Bath, ME	0.325	0.000		0.000		0.000		-		0.000	0.000	0.325	-
HED - DON Energy Initiative -OEM	Various	SYNTEK TECHNOLOGIES : Arlington, VA	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
		Subtotal	8.394	1.691		0.700		0.000		-		0.000	0.000	10.785	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	11.531	1.691		0.986		0.000		-		0.000	0.000	14.208	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3369 / *Hybrid Electric Drive*

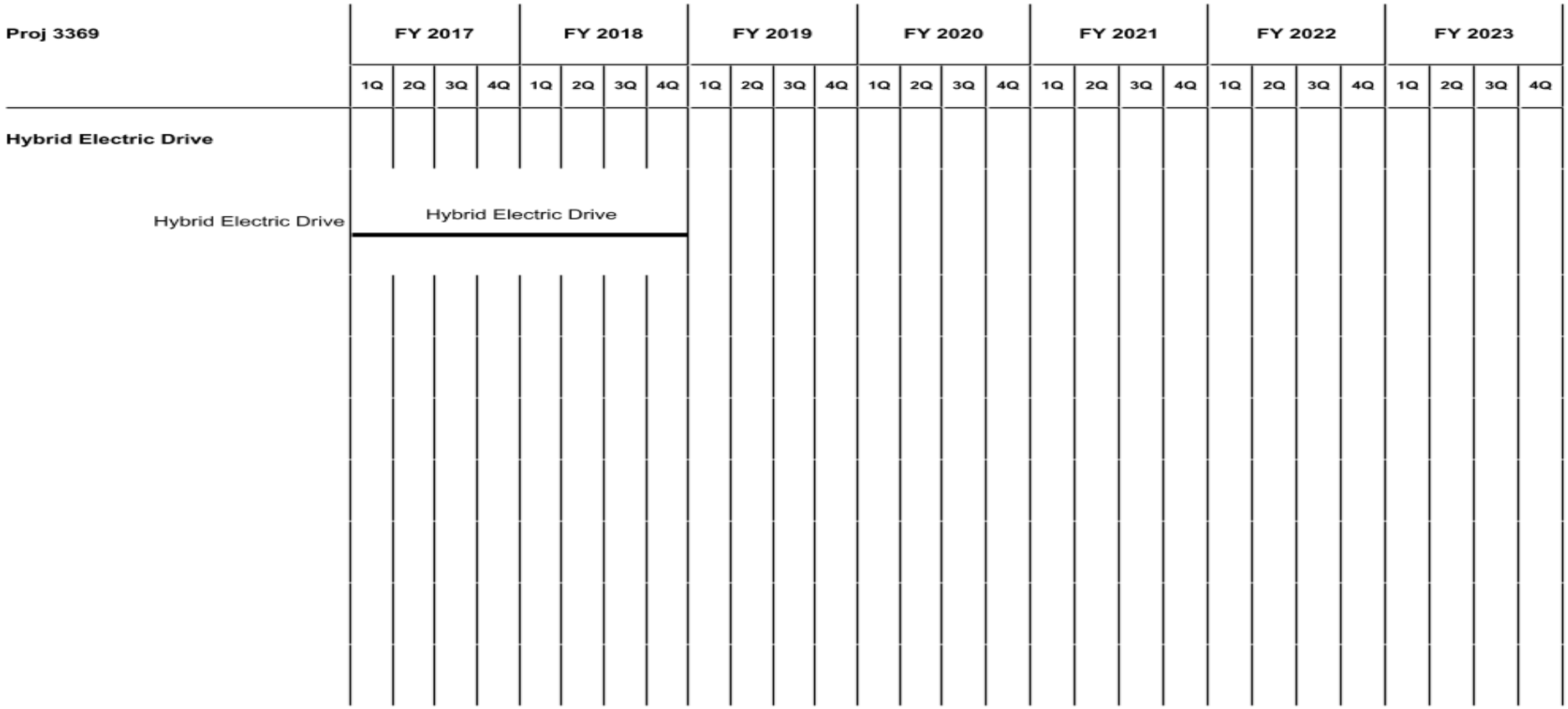


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3369 / *Hybrid Electric Drive*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3369				
Hybrid Electric Drive: Hybrid Electric Drive: Hybrid Electric Drive	1	2017	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 3374 / *MPF(F)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3374: *MPF(F)*	0.000	0.679	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.679
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project 3374 - Maritime Prepositioning Force (Future) - MPF(F) - Concept studies, preliminary, contract designs and technology development and testing leading to detail design, and construction award of ship systems for the initial operational capability milestone achievement that will provide a highly flexible, operational and logistics support
capability to enable Expeditionary Maneuver Warfare concepts and to meet required operational capabilities with respect to Force Closure, Amphibious Task Force Integration, Sustainment and Reconstitution/Redeployment.

FY 2018 ($0.468M) and FY 2016 and prior year efforts were financed under the National Sealift Defense Fund (NDSF) BA 04, Project 3110 (Maritime Prepositioning Force (Future)).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Engineering and Acquisition Support	0.679	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Funded in NDSF; testing completes in FY18.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	0.679	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• NDSF/0408042N/3110: *MPFF*	0.000	0.468	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.468

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3374 / *MPF(F)*

D. Acquisition Strategy

To supplement the current maritime prepositioning force, and to provide in theater capability to support resupplying a Maritime Expeditionary Brigade, the Department is procuring 2 Expeditionary Transfer Dock (ESD, formerly MLP)in FY11, and five (one each in FY12, FY14, FY16, FY19, and FY20) Expeditionary Sea Base (ESB, formerly MLP AFSB Variant configurations).

E. Performance Metrics

Annual Program Review

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3374 / *MPF(F)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test & Evaluation	WR	COTF : Norfolk VA	0.000	0.350	Jan 2017	0.000		0.000		-		0.000	0.000	0.350	-
Developmental Test & Evaluation	WR	CSC : Washington DC	0.000	0.150	Jan 2017	0.000		0.000		-		0.000	0.000	0.150	-
Live Fire Test & Evaluation	WR	CSC : Washington DC	0.000	0.179	Jan 2017	0.000		0.000		-		0.000	0.000	0.179	-
		Subtotal	0.000	0.679		0.000		0.000		-		0.000	0.000	0.679	N/A

Remarks

Award dates reflect initial award of incremental execution.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.679		0.000		0.000		-		0.000	0.000	0.679	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3374 / *MPF(F)*

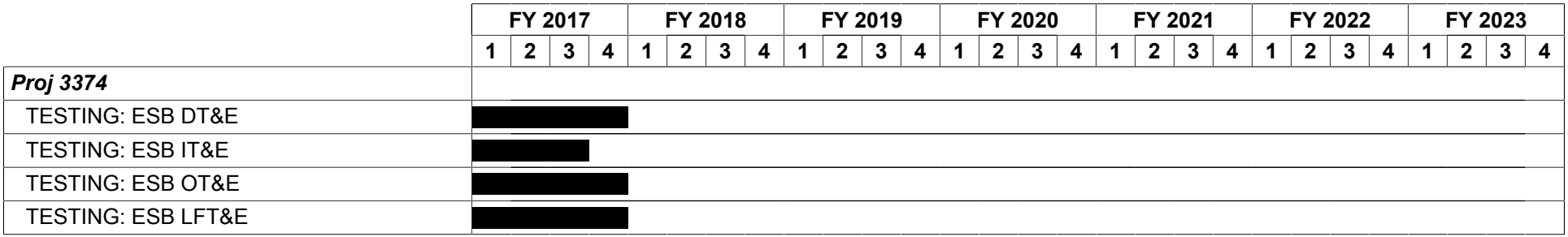


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 3374 / *MPF(F)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3374				
TESTING: ESB DT&E	1	2017	4	2017
TESTING: ESB IT&E	1	2017	3	2017
TESTING: ESB OT&E	1	2017	4	2017
TESTING: ESB LFT&E	1	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 4007 / *CVN 21 LFT&E*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
4007: *CVN 21 LFT&E*	65.822	3.629	3.983	4.011	-	4.011	4.167	4.311	4.405	4.500	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 223

A. Mission Description and Budget Item Justification

This project encompasses Live Fire Test and Evaluation (LFT&E) efforts for the CVN 78 Class. Title 10, US Code, Section 2366, CVN 21 Operational Requirements Document (ORD) and the CVN 78 Class Test and Evaluation Master Plan (TEMP) 1610 prescribe requirements for LFT&E. The purpose of LFT&E is to evaluate covered systems in a realistic combat environment before proceeding beyond low-rate initial production. Since the application of the survivability testing required by 10 USC 2366 to a CVN 78 Class ship would be unreasonably expensive and impractical, the Secretary of Defense waived the live fire testing requirement in 2004 and submitted a certification of that determination to Congress. The CVN 78 Class LFT&E Management Plan details the testing, modeling and simulation, and engineering analyses that are being used to determine whether CVN 78 Class ships will be able to survive and carry out their missions against the threat weapons identified in the Surface Ship Capstone System Threat Assessment Report (CSTAR) that are likely to be encountered in combat. The results of these tests and analyses are documented in periodic Vulnerability Assessment Reports (VARs).

The CVN 78 Class VAR 3 was completed in the summer of 2007 and the CVN 78 Class VAR 4 is scheduled to be completed in FY 18.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CVN 21 LFT&E	3.629	3.983	4.011	0.000	4.011
Articles:	-	-	-	-	-
FY 2018 Plans: Continue conducting Underwater Explosive analyses on the CVN 78 full-ship structural Finite Element Model (FEM) in support of the Analytical Bridge Study task. Begin development of the final Survivability Assessment Report (SAR). Continue planning for the CVN 78 TSST, which includes scenario development, cold checks on CVN 78 to update drill guides and implementation sheets, and development of the TSST Plan.					
FY 2019 Base Plans: Complete the analyses for the analytical bridge studies and complete the report. Continue planning for the CVN 78 Total Ship Survivability Trial (TSST) with the development of the TSST drill guides and implementation sheets. Perform a cold check on CVN 78 in support of TSST planning. Continue analyses and documentation for the final SAR.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 4007 / *CVN 21 LFT&E*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase due to inflation.					
Accomplishments/Planned Programs Subtotals	3.629	3.983	4.011	0.000	4.011

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN / 2001: *Carrier Replacement Program*	2,626.567	4,441.772	1,598.181	-	1,598.181	2,146.535	3,239.606	2,910.491	3,378.355	10,602.689	50,900.224
• SCN / 5300: *Completion of Prior Year Shipbuilding Programs*	0.000	20.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,394.860
• RDTEN / 0604112N: *Project Units 2208, 4004*	69.184	83.935	58.121	-	58.121	57.236	43.713	30.904	39.306	Continuing	Continuing
• OMN / 1B2B: *CVN 78 Ford Class Training and Sustainment (12BJ0)*	17.536	14.008	9.043	-	9.043	8.150	6.346	6.907	7.054	Continuing	Continuing
• OPN / 5664: *Surface Training Equipment*	4.490	12.010	7.942	-	7.942	0.994	4.965	2.964	3.023	Continuing	Continuing
• OMN / 1B1B: *Mission and Other Ship Operations (11B30)*	24.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.000

Remarks

D. Acquisition Strategy

The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 4007 / *CVN 21 LFT&E*

E. Performance Metrics

Complete: (1) the adjudication of final comments and updates to the CVN 78 Class LFT&E Management Plan, Revision B and route for signature; (2) the refinement of the CVN 78 structural FEM, in support of the Analytical Bridge analyses; and (3) the analyses and documentation for VAR 4 and route for signature.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 4007 / *CVN 21 LFT&E*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Live Fire Test & Evaluation	WR	NSWC Carderock : MD	55.457	1.816	Nov 2016	3.153	Nov 2017	2.897	Nov 2018	-		2.897	Continuing	Continuing	Continuing
Live Fire Test & Evaluation	C/CPAF	HII : VA	10.069	1.751	Nov 2016	0.750	Nov 2017	0.950	Nov 2018	-		0.950	Continuing	Continuing	Continuing
Live Fire Test & Evaluation	WR	NSWC Dahlgren : VA	0.286	0.062	Nov 2016	0.080	Nov 2017	0.082	Nov 2018	-		0.082	Continuing	Continuing	Continuing
Live Fire Test & Evaluation	C/CPFF	NAVSEA SEAPORT : DC	0.000	0.000		0.000		0.082	Dec 2018	-		0.082	0.000	0.082	-
		Subtotal	65.812	3.629		3.983		4.011		-		4.011	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Acquisition Workforce	TBD	Various : Various	0.010	0.000		0.000		0.000		-		0.000	0.000	0.010	-
		Subtotal	0.010	0.000		0.000		0.000		-		0.000	0.000	0.010	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	65.822	3.629		3.983		4.011		-		4.011	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 4007 / *CVN 21 LFT&E*

Gerald R. Ford Class Carriers

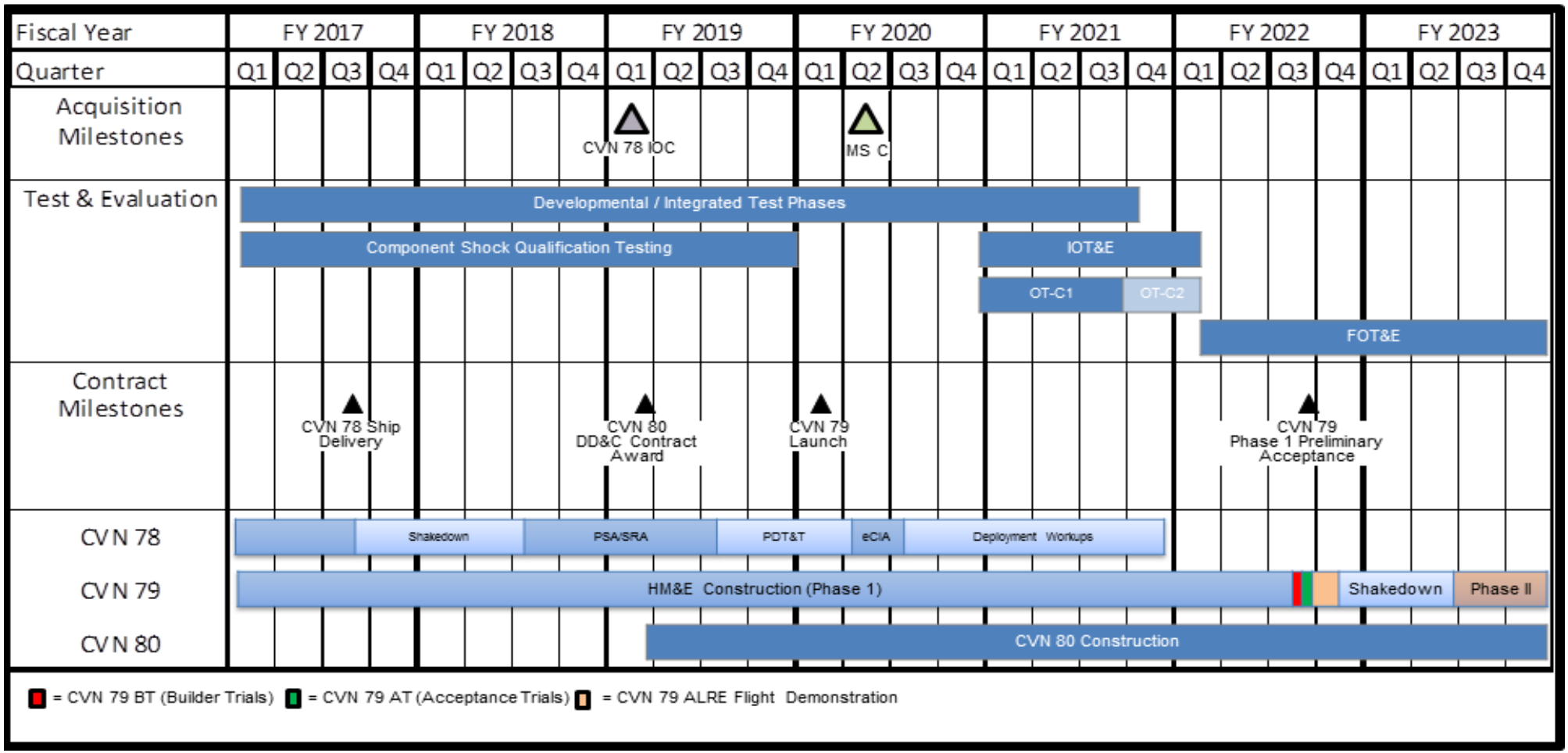


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 4007 / *CVN 21 LFT&E*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4007				
Initial Operational Capability	1	2019	1	2019
Milestone C	2	2020	2	2020
Component Shock Qualification Testing	1	2017	4	2019
Initial Operational Test & Evaluation	4	2020	1	2022
CVN 80 Construction Contract Award	1	2019	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	19.343	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.343
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for CVN 78 Class cost reduction activities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: CVN Cost Reduction Activities	19.343	0.000
FY 2017 Accomplishments: Discover and assess CVN 78 Class affordability initiatives. Develop cost-saving initiatives, game changers, business case analyses, and affordability initiatives to continue to drive affordability into the carrier program. Perform CVN 80-specific engineering calculations and technical analysis in the areas of technical performance measures, system component calculations, environmental safety and health and human factors engineering, survivability and vulnerability, automation systems software, shock and vibration, and engineered components support. Conduct or support feasibility and tradeoff studies on shipbuilder processes. Conduct or support feasibility and tradeoff studies on new and modified shipboard systems and equipment. Studies shall include engineering analyses, including Key Performance Parameter (KPP) impact assessments; identification of subsystem, integration, logistics, and testing impacts; material procurement; preliminary cost estimates for decision-making purposes; development of potential contract change documentation; conducting / supporting ship checks; developmental testing; and report development and submission.		
FY 2018 Plans: N/A		
Congressional Adds Subtotals	19.343	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN / 2001: *Carrier Replacement Program*	2,626.567	4,441.772	1,598.181	-	1,598.181	2,146.535	3,239.606	2,910.491	3,378.355	10,602.689	50,900.224
• SCN / 5300: *Completion of Prior Year Shipbuilding Program*	0.000	20.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1,394.760

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTEN / 0604112N: *Project Units 2208, 4004*	69.184	83.935	58.121	-	58.121	57.236	43.713	30.904	39.306	Continuing	Continuing
• OMN / 1B2B: *CVN 78 Ford Class Training and Sustainment*	17.536	14.008	9.043	-	9.043	8.150	6.346	6.907	7.054	Continuing	Continuing
• OPN / 5664: *Surface Training Equipment*	4.490	12.010	7.942	-	7.942	0.994	4.965	2.964	3.023	Continuing	Continuing
• OMN / 1B1B: *Mission and Other Ship Operations (11B30)*	24.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.000

Remarks

D. Acquisition Strategy

The CVN 80 is the third ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class Carriers. The CVN 80 is a modified repeat of the CVN 78, which features a new nuclear propulsion and electrical generation / distribution system, electromagnetic aircraft launching system, advanced arresting gear system, electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war-fighting benefits will be realized: increased sortie generation rate, improved ship self defense capability, increased launch and recovery capability / flexibility, increased operational availability, and increased flexibility to support future upgrades.

CVN 80 will use late integration of Government-Furnished Equipment to provide the latest combat system and C4I suite applications within the planned system baseline. CVN 80 will improve upon processes used on CVN 78 and CVN 79 to gain efficiencies during the CVN 80 Construction Preparation and Construction periods.

E. Performance Metrics

Development of FORD Class affordability initiatives to incorporate into the CVN 80 design and CVN 79 production as applicable.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604567N / *Ship Contract Design/ Live Fire T&E*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Total Ship Integration	C/CPAF	HII : VA	0.000	16.000	Jul 2017	0.000		0.000		-		0.000	0.000	16.000	-
Total Ship Integration	C/CPFF	NAVSEA SEAPORT : DC	0.000	1.717	Aug 2017	0.000		0.000		-		0.000	0.000	1.717	-
Total Ship Integration	WR	NSWC Carderock : MD	0.000	0.500	Jul 2017	0.000		0.000		-		0.000	0.000	0.500	-
Total Ship Integration	WR	NSWC Philadelphia : PA	0.000	0.296	Jul 2017	0.000		0.000		-		0.000	0.000	0.296	-
Total Ship Integration	TBD	Miscellaneous : Various	0.000	0.830	Sep 2017	0.000		0.000		-		0.000	0.000	0.830	-
		Subtotal	0.000	19.343		0.000		0.000		-		0.000	0.000	19.343	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	19.343		0.000		0.000		-		0.000	0.000	19.343	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 9999 / *Congressional Adds*

Gerald R. Ford Class Carriers

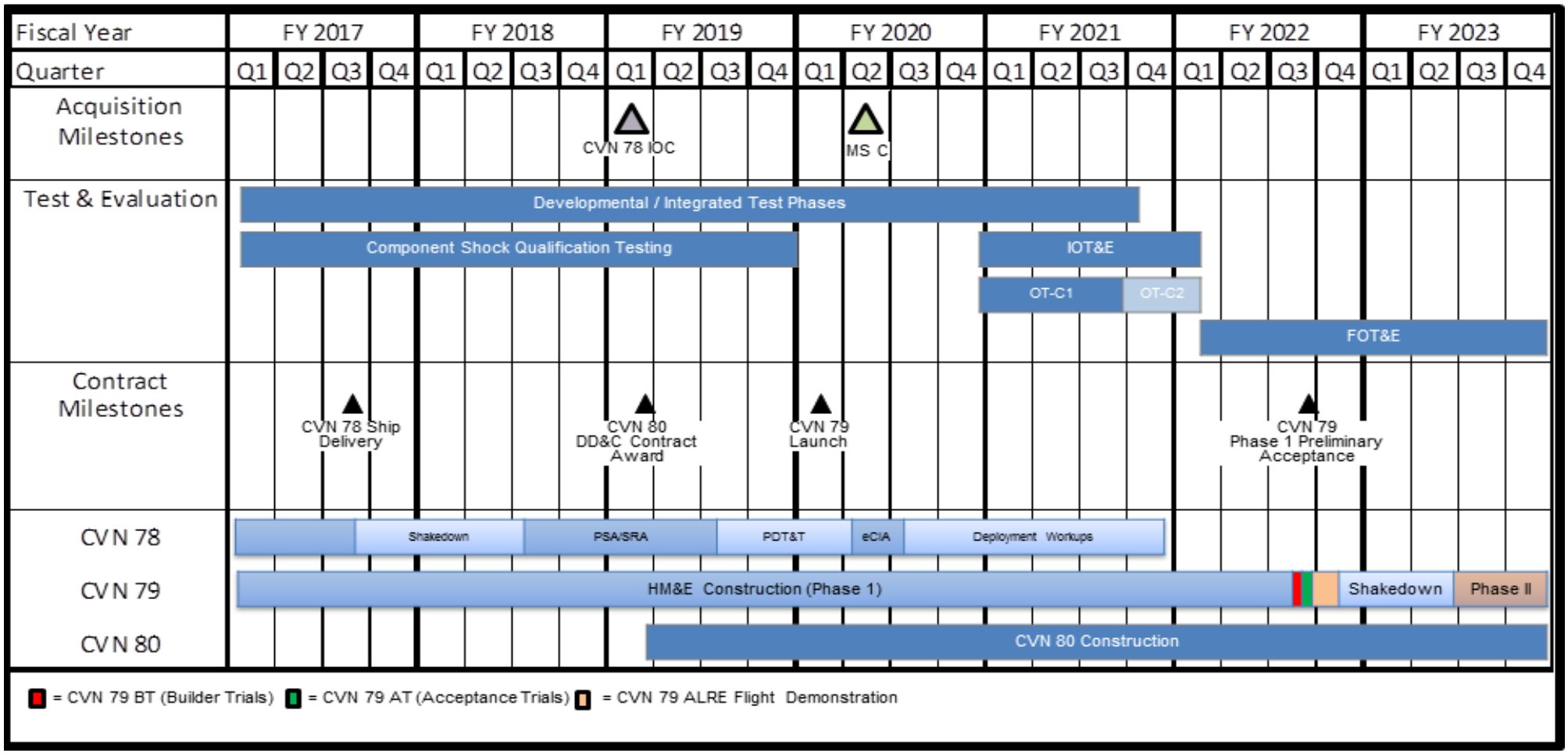


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604567N / *Ship Contract Design/ Live Fire T&E*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Initial Operational Capability	1	2019	1	2019
Milestone C	2	2020	2	2020
Component Shock Qualification Testing	1	2017	4	2019
Initial Operational Test & Evaluation	4	2020	1	2022
CVN 80 Construction Contract Award	1	2019	1	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604574N *I Navy Tactical Computer Resources*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	7.937	3.059	4.817	4.642	-	4.642	4.022	3.994	4.078	4.163	Continuing	Continuing
3360: *Common Processing System (CPS)*	2.644	0.877	1.685	1.599	-	1.599	1.445	1.478	1.508	1.541	Continuing	Continuing
3361: *Common Display System (CDS)*	5.293	2.182	3.132	3.043	-	3.043	2.577	2.516	2.570	2.622	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Common Processing System (CPS) and Common Display System (CDS) programs support developing technology insertions in a competitively sourced environment. CPS & CDS provide technical replacements for obsolete display and processing equipment (such as AN/UYQ-70) for multiple warfare systems aboard Surface Combatants and Large Deck class ships.

CPS provides computer processing and memory, data storage and extraction, and Input/Output (I/O) interface to support hosting Navy combat system software applications and computing resources. These upgrades support AEGIS Modernization, AEGIS new construction, AEGIS Ashore, Ship Self Defense System (SSDS) MK2, Surface Electronic Warfare Improvement Program (SEWIP), and other Navy programs. Funding provides for technical management and Engineering Change Proposals (ECP) development for the common baseline. Procurement and development funds provided by user programs to support program unique requirements.

CDS provides operator display consoles with a common human machine interface to support the Combat System operations. These upgrades support AEGIS modernization, AEGIS new construction, AEGIS Ashore, DDG-1000, Ship Self Defense System (SSDS) MK 2, Gun Weapon System (GWS), and SEWIP. Funding provides for technical management and Engineering Change Proposals (ECP) development for the common baseline. Procurement and development funds provided by user programs to support program unique requirements.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	3.098	4.817	4.727	-	4.727
Current President's Budget	3.059	4.817	4.642	-	4.642
Total Adjustments	-0.039	0.000	-0.085	-	-0.085
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.039	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.085	-	-0.085

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604574N / *Navy Tactical Computer Resources*	Project (Number/Name) 3360 / *Common Processing System (CPS)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3360: *Common Processing System (CPS)*	2.644	0.877	1.685	1.599	-	1.599	1.445	1.478	1.508	1.541	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Processing System (CPS) program supports developing open architecture computer processing hardware and storage technology in a competitively sourced environment. CPS provides technical replacements for obsolete processing equipment (such as AN/UYQ-70) for multiple warfare systems aboard Surface Combatants and Large Deck class ships. CPS provides computer processing and memory, data storage and extraction, and Input/Output (I/O) interface to support hosting Navy combat system software applications and computing resources. These upgrades support AEGIS Modernization, AEGIS new construction, Ship Self Defense System (SSDS) MK2, Surface Electronic Warfare Improvement Program (SEWIP), and other Navy programs. Funding provides for technical management and Engineering Change Proposals (ECP) development for the common baseline. Procurement and development funds provided by user programs to support program unique requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Common Processing System (CPS)	0.877	1.685	1.599	0.000	1.599
Articles:	-	-	-	-	-
FY 2018 Plans: Continue system engineering support of CPS TI-12 / TI-16 development efforts required to support various Combat and Weapon System Configurations. Support Engineering Analysis of issues identified within field configuration TI-12 to develop resolution plan to improve reliability, readiness, or reduce operating costs. Support System Engineering efforts required to achieve In-Progress Review for TI-20 milestone. FY18 increase is due to additional efforts required to support Technology Insertion (TI) MK 6 MOD 1 Equipment Suite CPS modifications to support the Critical Design Review (CDR), Test Readiness Review (TRR) and delivery of the initial Technical Data Package (TDP) all in FY18. MK 6 MOD 1 includes CPS Capability updates, DMS resolution and ACB-20 NCD derived requirement improvements. In addition, initial design work for TI MK 7 CPS will commence in FY18.					
FY 2019 Base Plans: Continue system engineering support of CPS TI-16 development efforts required to support various Combat and Weapon System Configurations. Support Engineering Analysis of issues identified within field configuration					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3360 / *Common Processing System (CPS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
TI-12 to develop resolution plan to improve reliability, readiness, or reduce operating costs. Support System Engineering efforts required to achieve Program Readiness Review (PRR) for TI-20 milestone in 4th quarter. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Rate/Misc adjustments.					
Accomplishments/Planned Programs Subtotals	0.877	1.685	1.599	0.000	1.599

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

CPS TI-16: Award build to Print Indefinite Delivery Indefinite Quantity (IDIQ) production contract for FY17-FY21.

E. Performance Metrics

Major Milestones:
CPS TI-12 Build-To-Print Contract Award (Procurement Order Available until second quarter FY17.
CPS TI-20 In Process Review No. 1 third quarter FY17.
CPS TI-20 In Process Review No. 2 first quarter FY18.
CDP TI-20 Preliminary Design Review third quarter FY18.
CPS TI-20 Production Readiness Review fourth quarter FY19.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3360 / *Common Processing System (CPS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NSWC : PHD	0.010	0.000		0.240	Oct 2017	0.147	Oct 2018	-		0.147	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : Dahlgren	1.384	0.760	Nov 2016	0.785	Nov 2017	0.785	Nov 2018	-		0.785	Continuing	Continuing	Continuing
Systems Engineering	C/CPIF	TBD : TBD	1.166	0.063	Nov 2016	0.605	Dec 2017	0.607	Oct 2018	-		0.607	0.000	2.441	-
		Subtotal	2.560	0.823		1.630		1.539		-		1.539	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Services	Various	Various : Various	0.084	0.054	Oct 2016	0.055	Oct 2017	0.060	Oct 2018	-		0.060	Continuing	Continuing	Continuing
		Subtotal	0.084	0.054		0.055		0.060		-		0.060	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.644	0.877		1.685		1.599		-		1.599	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3360 / *Common Processing System (CPS)*

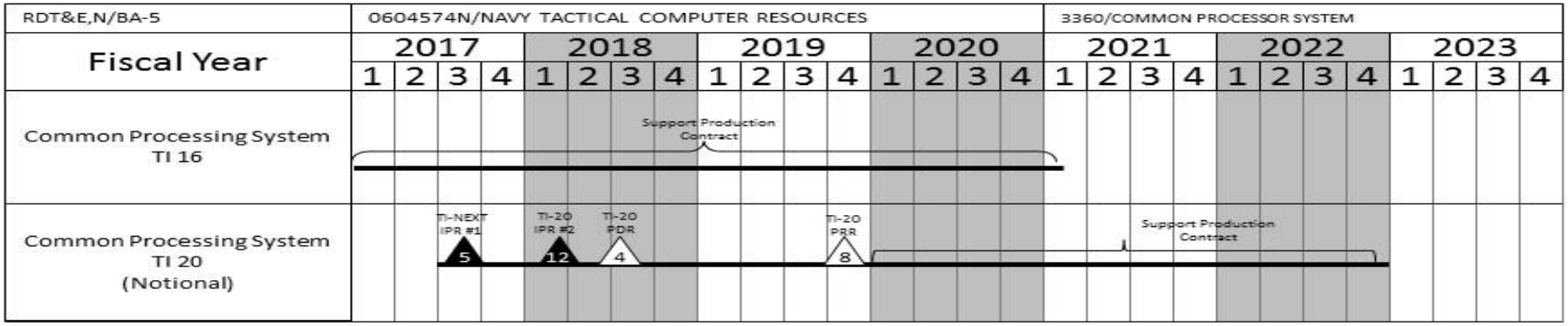


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3360 / *Common Processing System (CPS)*

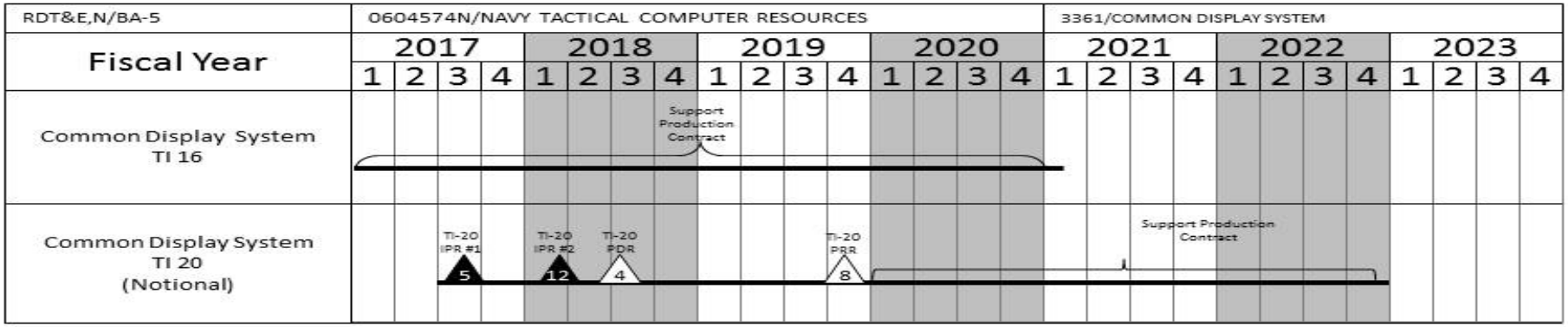


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3360 / *Common Processing System (CPS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3360				
CPS TI 20 In Progress Review (IPR) No. 1	3	2017	3	2017
CPS TI 20 In Progress Review (IPR) No. 2	1	2018	1	2018
CPS TI 20 PDR	3	2018	3	2018
CPS TI 20 PRR	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604574N / *Navy Tactical Computer Resources*	Project (Number/Name) 3361 / *Common Display System (CDS)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3361: *Common Display System (CDS)*	5.293	2.182	3.132	3.043	-	3.043	2.577	2.516	2.570	2.622	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Display System (CDS) programs support developing technology insertions in a competitively sourced environment. CDS provide technical replacements for obsolete display and processing equipment (such as AN/UYQ-70) for multiple warfare systems aboard Surface Combatants and Large Deck class ships. CDS provides operator display consoles with a common human machine interface to support the Combat System operations. These upgrades support AEGIS modernization, AEGIS new construction, AEGIS Ashore, DDG-1000, Ship Self Defense System (SSDS) MK 2, Gun Weapon System (GWS), and SEWIP. Funding provides for technical management and Engineering Change Proposals (ECP) development for the common baseline. Procurement and development funds provided by user programs to support program unique requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Common Display System (CDS)	2.182	3.132	3.043	0.000	3.043
Articles:	-	-	-	-	-
FY 2018 Plans: Continue system engineering support of CDS TI-12 / TI-16 development efforts required to support various Combat and Weapon System Configurations. Support Engineering Analysis of issues identified within field configuration TI-12 to develop resolution plan to improve reliability, readiness, or reduce operating costs. Support System Engineering efforts required to achieve In-Progress Review for TI-20 milestone. FY18 increase is due to additional efforts required to support Technology Insertion (TI) MK 6 MOD 1 Equipment Suite CDS modifications to support the Critical Design Review (CDR), Test Readiness Review (TRR) and delivery of the initial Technical Data Package (TDP) all in FY18. MK 6 MOD 1 includes CDS Capability updates, DMS resolution and ACB-20 NCD derived requirement improvements. In addition, initial design work for TI MK 7 CDS will commence in FY18.					
FY 2019 Base Plans: Continue system engineering support of CDS TI-12 / TI-16 development efforts required to support various Combat and Weapon System Configurations. Support Engineering Analysis of issues identified within field configuration TI-12 to develop resolution plan to improve reliability, readiness, or reduce operating costs.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3361 / *Common Display System (CDS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Support System Engineering efforts required to achieve Program Readiness Review (PRR) for TI-20 milestone in 4th quarter. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Rate/Misc Adjustments.					
Accomplishments/Planned Programs Subtotals	2.182	3.132	3.043	0.000	3.043

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Contracts:
CDS TI-16: Award build to Print IDIQ production contract for FY17-FY21.

E. Performance Metrics

Major Milestones:
Completed CDS TI-20 In Process Review No. 1 third quarter FY17.
CDS TI-20 In Process Review No. 2 first quarter FY18.
CDS TI-20 Preliminary Design Review third quarter FY18.
CDS TI-20 Production Readiness Review fourth quarter FY19.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3361 / *Common Display System (CDS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NSWC : PHD	0.212	0.106	Dec 2016	0.212	Dec 2017	0.215	Dec 2018	-		0.215	Continuing	Continuing	Continuing
Systems Engineeing	WR	NSWC : Dahlgren	3.217	1.576	Oct 2016	1.785	Oct 2017	1.585	Oct 2018	-		1.585	Continuing	Continuing	Continuing
Systems Engineering	C/CPFF	General Dynamics : Fairfax, VA	0.461	0.154	Oct 2016	0.500	Oct 2017	0.445	Oct 2018	-		0.445	0.000	1.560	-
Systems Engineering	C/CPIF	DRS Technologies : Gaithersburg, MD	0.523	0.152	Oct 2016	0.500	Oct 2017	0.455	Dec 2018	-		0.455	0.000	1.630	-
Systems Engineering	C/CPIF	TBD : TBD	0.697	0.100	Dec 2016	0.027	Dec 2017	0.243	Oct 2018	-		0.243	0.000	1.067	-
		Subtotal	5.110	2.088		3.024		2.943		-		2.943	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Services	Various	Various : Various	0.183	0.094	Dec 2016	0.108	Dec 2017	0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
		Subtotal	0.183	0.094		0.108		0.100		-		0.100	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.293	2.182		3.132		3.043		-		3.043	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3361 / *Common Display System (CDS)*

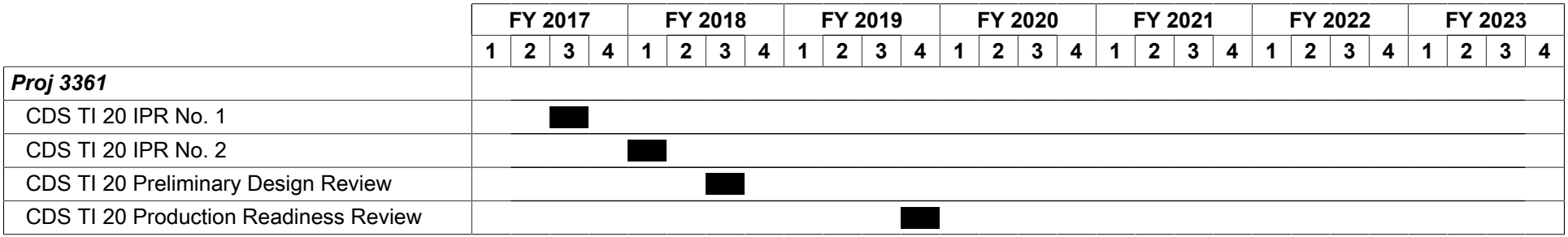


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604574N / *Navy Tactical Computer Resources*	**Project (Number/Name)** 3361 / *Common Display System (CDS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3361				
CDS TI 20 IPR No. 1	3	2017	3	2017
CDS TI 20 IPR No. 2	1	2018	1	2018
CDS TI 20 Preliminary Design Review	3	2018	3	2018
CDS TI 20 Production Readiness Review	4	2019	4	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604580N *I (U)Virginia Payload Module (VPM)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	325.673	94.846	72.861	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.380
4500: *VIRGINIA Payload Module*	325.673	94.846	72.861	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.380
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 516												

Note

1. Detailed design funding for this project transitions to SCN (BLI: 2013) beginning in FY17 to support VPM production beginning in FY20.

A. Mission Description and Budget Item Justification

The U.S. Navy must maintain a submarine fleet that is of sufficient capability and numbers to defend American interests. The VIRGINIA Class Submarine, formerly the New Attack Submarine (New SSN), is designed to fulfill this need. It will counter the potential threats of the next century in a multi- mission capable submarine that has the ability to provide covert, sustained combat presence in denied waters. The primary goal of the program is to develop an affordable yet capable submarine by evaluating a broad range of system and technology alternatives, and pursuing cost reduction, producibility improvement, and technical risk management. This Program Element (PE) provides the technology, prototype components, and systems engineering needed to design and construct the VIRGINIA Payload Module (VPM). VPM mitigates and will recapitalize the conventional TOMAHAWK Land Attack Missile (TLAM) gap created by the retirement of SSGNs in the late 2020s while maintaining current platform requirements. This PE directly supports the following VIRGINIA Class Submarine missions: (1) covert strike warfare; (2) anti-submarine warfare; (3) covert intelligence collection/surveillance, indication and warning, and electronic warfare; (4) anti-surface ship warfare; (5) special warfare; (6) mine warfare; and (7) battle group support.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	97.920	72.861	0.000	-	0.000
Current President's Budget	94.846	72.861	0.000	-	0.000
Total Adjustments	-3.074	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.074	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604580N *I (U)Virginia Payload Module (VPM)*

Change Summary Explanation

Program ends in FY19 and transitions to SCN line item 2013 Virginia Class Submarines for implementation in the pending Virginia Block V contract.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0604580N / *(U)Virginia Payload Module (VPM)*			Project (Number/Name) 4500 / *VIRGINIA Payload Module*					
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
4500: *VIRGINIA Payload Module*	325.673	94.846	72.861	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	493.380
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 516

A. Mission Description and Budget Item Justification

This project encompasses Navy RDT&E efforts required to incorporate a modular design for future VIRGINIA Class Submarines (VCS) which integrates additional strike payload capacity for Tomahawk Land Attack and follow on missiles. The design is targeted for VCS Block V (FY19-23 ships).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Non-Propulsion Electronics System (NPES) Engineering	12.103	12.700	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Formal EQT of the new Common Weapons Launcher (CWL) electronics and support structure will take place, including full shock test. TOMAHAWK missile electrical characteristic and interface requirements verification testing will commence, necessary to validate accurate power and navigation data inputs. Combat system interface and fail-over modes will be tested to confirm proper SWFTS interoperability. And various fleet operator concept of operations demonstrations will take place to support development of operator training and maintenance procedures.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decreased from FY18 to FY19 as project shifts from RDT&E to SCN Detailed Design.					
Title: Hull, Mechanical, and Electrical (HM&E) Systems Engineering	82.743	60.161	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Continue design efforts for the VPM including integration to existing hull structure, hydrodynamic assessments, hydraulic system design, tube control interface, and internal arrangements to accommodate hardware,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604580N / *(U)Virginia Payload Module (VPM)*	**Project (Number/Name)** 4500 / *VIRGINIA Payload Module*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
electronics and personnel. Continue executing IMS and Manufacturing Plans. Continue payload tube proto-tactical construction and receipt of ITHs and ITKs. Complete prototypical larger capacity Air Conditioning plant and qualify plant for capacity and noise; begin production of first prototype unit Air Conditioning plant. Complete payload tube prototype. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decreased from FY18 to FY19 as project shifts from RDT&E to SCN Detailed Design.					
Accomplishments/Planned Programs Subtotals	94.846	72.861	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/2013: *VIRGINIA Class Submarine*	5,040.219	5,225.911	7,169.783	-	7,169.783	7,150.388	6,475.968	6,004.291	6,126.497	40,799.161	150,316.746
• OPN/0942: *Virginia Class Support Equipment*	63.908	46.610	66.328	-	66.328	28.465	23.263	22.910	23.326	Continuing	Continuing
• OMN/1B2B: *Ship Operational Support and Training*	781.123	997.328	997.663	20.236	1,017.899	993.535	1,019.377	1,044.931	1,070.013	0.000	6,924.206
• RDT&E/0604558N/1947: *New Design SSN HM&E*	83.732	82.506	104.968	-	104.968	78.062	155.449	192.807	236.241	Continuing	Continuing
• RDT&E/0604558N/1950: *New Design SSN Combat Sys Dev*	25.285	34.913	40.604	-	40.604	37.757	36.568	37.327	38.097	Continuing	Continuing

Remarks

D. Acquisition Strategy

The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach has facilitated a smoother transition from design to manufacturing and has reduced the number of changes typically encountered during construction of the lead and early follow-on ships. In September 1997, Congress passed a law

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604580N / *(U)Virginia Payload Module (VPM)*	**Project (Number/Name)** 4500 / *VIRGINIA Payload Module*

allowing Electric Boat (EB) and Northrop Grumman Newport News (NGNN), now Huntington Ingalls Industries (HII), to team for production of the first four VIRGINIA Class Submarines. Under the teaming agreement, EB remained the design yard for the VIRGINIA Class Submarine and HII became a part of the IPPD process. The Program Office is managing two Multi-Year Procurement (MYP) contracts. The first is for the Block III (FY09-13) ships. The second is for the Block IV (FY14-18) ships awarded April 2014. All Block I & II ships (SSNs 774-783) have been delivered. The first two Block III ships, SSN 784 and SSN 785, delivered in August 2014 and June 2015 respectively, with the remaining six ships awarded and under construction. The first six Block IV ships are awarded and under construction, with the remaining four to be authorized and appropriated in FY 2017 and FY 2018. Developmental efforts began in FY13 and will be executed via current Lead Design Yard Agent contract with Electric Boat. The program is currently planning for the fourth MYP (Block V) contract that will reflect 10 SSNs (FY19-23) and is anticipated to award in Early FY 2019.

E. Performance Metrics

Preliminary Design Review
Critical Design Review

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604580N / *(U)Virginia Payload Module (VPM)*	Project (Number/Name) 4500 / *VIRGINIA Payload Module*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Development	WR	NSWC : Carderock, MD	38.566	10.200	Nov 2016	2.246	Nov 2017	0.000		-		0.000	15.815	66.827	-
Component Development	WR	NUWC : Newport, RI	22.281	6.500	Nov 2016	1.853	Nov 2017	0.000		-		0.000	20.538	51.172	-
Component Development	C/CPFF	Electric Boat : Groton, CT	250.076	70.646	Nov 2016	63.094	Nov 2017	0.000		-		0.000	132.370	516.186	-
Component Development	C/CPFF	GD-AIS : Pittsfield, MA	14.000	4.600	Jan 2017	4.975	Jan 2018	0.000		-		0.000	0.000	23.575	-
Component Development	WR	PMA 280/281 : Pax River, MD	0.000	2.700	Jan 2017	0.000	Jan 2018	0.000		-		0.000	0.000	2.700	-
Component Development	SS/CPFF	ARL/PSU : UNIVERSITY PARK, PA	0.000	0.200	Jan 2017	0.000	Jan 2018	0.000		-		0.000	0.000	0.200	-
Component Development	WR	NSWC : Philadelphia, PA	0.000	0.000		0.287	Nov 2017	0.000		-		0.000	0.000	0.287	-
Component Development	C/CPFF	Raytheon : Tuscon, AZ	0.000	0.000		0.406	Jan 2018	0.000		-		0.000	0.000	0.406	-
		Subtotal	324.923	94.846		72.861		0.000		-		0.000	168.723	661.353	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPAF	SEAPORT : Rockville, MD	0.750	0.000		0.000		0.000		-		0.000	0.500	1.250	-
		Subtotal	0.750	0.000		0.000		0.000		-		0.000	0.500	1.250	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	325.673	94.846		72.861		0.000		-		0.000	169.223	662.603	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604580N / *(U)Virginia Payload Module (VPM)*	**Project (Number/Name)** 4500 / *VIRGINIA Payload Module*

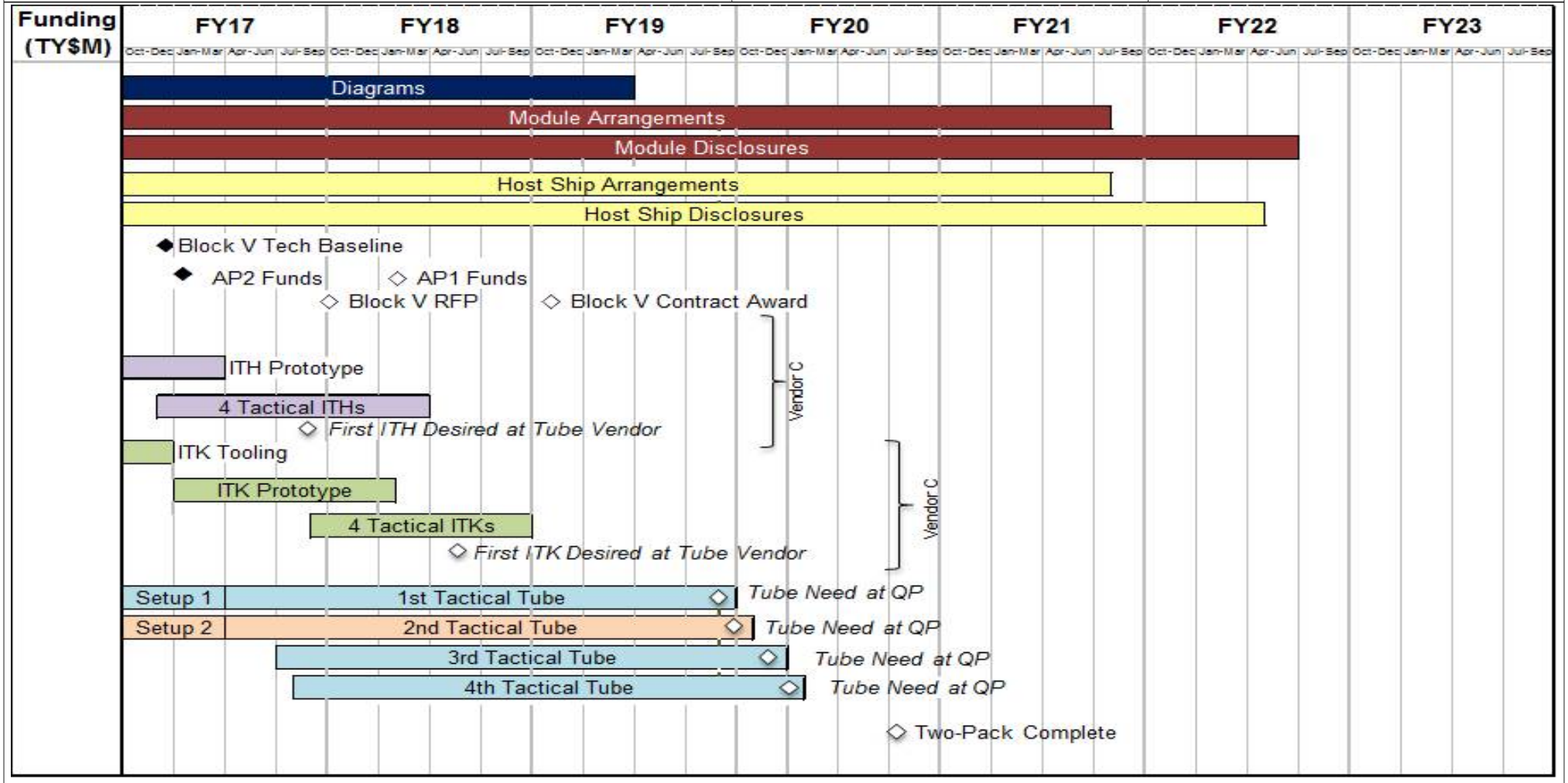


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604580N / *(U)Virginia Payload Module (VPM)*	**Project (Number/Name)** 4500 / *VIRGINIA Payload Module*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4500				
Diagrams	1	2017	2	2019
Module Arrangements	1	2017	4	2021
Module Design Development	1	2017	3	2022
Host Ship Arrangements	1	2017	4	2021
Host Ship Design Development	1	2017	3	2022
Block V Tech Baseline	1	2017	1	2017
Block V RFP	4	2017	4	2017
Block V Contract Award	1	2019	1	2019
Vendor C ITH Prototype	1	2017	2	2017
Vendor C 4 Tactical ITHs	1	2017	2	2018
Vendor C ITK tooling	1	2017	1	2017
Vendor C ITK Prototype	2	2017	1	2018
Vendor C 4 Tactical ITKs	4	2017	1	2019
1st Tactical Tube	1	2017	4	2019
2nd Tactical Tube	1	2017	1	2020
3rd Tactical Tube	4	2017	1	2020
4th Tactical Tube	4	2017	2	2020
Two-Pack Complete	4	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604601N *I Mine Development*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	195.856	14.860	25.635	25.756	-	25.756	22.021	21.513	21.204	21.215	Continuing	Continuing
0267: *Mine Improvements*	195.856	14.860	17.617	18.401	-	18.401	15.160	19.103	10.363	10.152	Continuing	Continuing
2993: *Encapsulated Effector*	0.000	0.000	8.018	7.355	-	7.355	6.861	2.410	10.841	11.063	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element provides resources to develop naval mine systems used to establish and maintain control of essential sea areas. Naval mines are used to deny sea area or inflict damage on adversary shipping to hinder, disrupt, and deny adversary operations. Naval mining is employed to reduce the adversary's threat to friendly forces and preserve access. Mining complements and comprises an essential part of other warfare areas; particularly strike, anti-submarine, and anti-surface warfare.

Resources are for developing and deploying improvements to target detection of modern threat vessels, reconfiguring and improving existing mine hardware for delivery from safe standoff distances, including integration with unmanned systems, adding a capability for networked command and control of deployed minefields, updating minefield planning tools to enable required operational timelines, and developing a wide area of coverage mine system capable of operating in intermediate and deep water depths. Core capabilities enabled include forward presence, deterrence, sea control, power projection, and maritime security to maintain freedom of the seas.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	15.290	25.635	18.495	-	18.495
Current President's Budget	14.860	25.635	25.756	-	25.756
Total Adjustments	-0.430	0.000	7.261	-	7.261
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.429	0.000			
• Program Adjustments	0.000	0.000	7.700	-	7.700
• Rate/Misc Adjustments	-0.001	0.000	-0.439	-	-0.439

Change Summary Explanation

FY19 +$7,261k Total Adjustments: +$7,700k for Clandestine Delivered Mine (CDM) Development; -$133k Process Improvement Reduction; $306k reduction for economic assumptions

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604601N / *Mine Development*	Project (Number/Name) 0267 / *Mine Improvements*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0267: *Mine Improvements*	195.856	14.860	17.617	18.401	-	18.401	15.160	19.103	10.363	10.152	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Naval mines are used to deter or control adversary movements, including surface ships and submarines. Mine Improvement R&D supports the capability to maintain effectiveness of mines facing new threat targets with increasing emphasis on major regional conflicts and littoral warfare in shallow water. The funding supports four major project areas.

1) Quickstrike Mod 3 improves effectiveness of existing Quickstrike mines against modern threats by using a programmable Target Detection Device (TDD) Mk 71. Quickstrike Mod 3 utilizes modeling and analysis to improve target detection and response by developing optimized mine settings and firing algorithms.

2) Aerial delivery improvements support capabilities required by a Joint Emergent Operational Needs Statement (JEONS). This includes adding GPS-guided, modular flight gear to the Quickstrike series to reduce risk to delivery aircraft by introducing precision placement and standoff range.

3) Clandestine Delivered Mine (CDM) provides a capability required by the JEON PC-0012 which will convert legacy mining systems for delivery by Extra Large Unmanned Undersea Vehicles (XLUUV). This capability allows access to contested environments and reduces risk by using unmanned platforms. Pre-planned product improvements to CDM incorporates the programmable TDD Mk 71 and adds remote command and control functions for increased operational flexibility and safety for emplaced minefields.

4) Minefield planning improvements include incorporation of new targeting algorithms, mine settings, and corresponding damage data for weapon/target pairs into existing minefield planning software. Also included is the development of upgrades to the software tool to allow optimization of minefield planning to account for new precision placement capabilities inherent to the JDAM-guided Quickstrike and CDM mines described above.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	10.675	11.984	12.668	0.000	12.668
Articles:	-	-	-	-	-
FY 2018 Plans: Complete development of targeting algorithm for the large ship algorithm. Continue generating operational data, based on updated fleet priority targets, for following target detection algorithms: fast patrol boat, diesel electric submarines, and large ship algorithms. Support and assess results of end-to-end testing of CDM phase 1 during an in-water event that demonstrates weapon build-up, loading, transit, delivery, arming sequence, target detection, and simulated fire. Obtain WSESRB concurrence for CDM phase 1. Development prototype					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 0267 / *Mine Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
remote control system for CDM, including integration of Target Detection Device Mk 71 in CDM. Develops underwater networking between mines, modifies commercial communications equipment to optimize reliability and range, while minimizing probability of detection by adversaries. Develop ruggedized flight gear interfaces to be compatible with GPS-guidance kits and high speed water impacts. Perform safety analysis of proposed design changes to mitigate hazards ***FY 2019 Base Plans:*** Complete development of updated targeting algorithm for diesel electric submarine. Continue development of CDM incremental improvements, including an updated fuze design to allow for remote arming and disarming functions. Continue development of networked communications to optimize reliability and range, while minimizing probability of detection by adversaries. Conduct system safety assessment and analysis to mitigate hazards in order to obtain concurrence by safety approval authorities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY19 will support the increased development efforts for the CDM incremental improvements.					
Title: Support	0.060	0.085	0.090	0.000	0.090
Articles:	-	-	-	-	-
FY 2018 Plans: Maintain cyber security posture and provide technical support of Mine Warfare development lab. Begin cyber security analysis and documentation in support of the remote control of the Clandestine Delivered Mine. ***FY 2019 Base Plans:*** Maintain cyber security posture and provide technical support of Mine Warfare development lab. Continue cyber security analysis and documentation in support of the remote control of the Clandestine Delivered Mine. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The minimal increase in FY19 supports the required cyber security efforts and the mine warfare development lab.					
Title: Management:	0.060	0.080	0.085	0.000	0.085
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 0267 / *Mine Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Program management support, contract support and travel ***FY 2019 Base Plans:*** Program management support, contract support and travel ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The minimal increase in FY19 supports management of the mine development programs.					
Title: Test and Evaluation	4.065	5.468	5.558	0.000	5.558
Articles:	-	-	-	-	-
FY 2018 Plans: Support JEONS capability development by testing Quickstrike configuration with JDAM equipped tail section, including interface reliability testing and aircraft integration testing. Conduct laboratory integration testing and in-water test of CDM to evaluate interfaces with delivery vehicle, proper deployment and safe arming sequence. Conduct end-to-end testing of CDM phase I during an in-water event that demonstrates weapon build-up, loading, transit, delivery, arming sequence, target detection, and simulated fire. Complete safety qualification testing of fuze and battery components of CDM. Conduct explosive ordnance disposal (EOD) render safe procedures testing to ensure safe disposal procedures are safe and effective for EOD forces ***FY 2019 Base Plans:*** Finish aircraft certification of B-52. Conduct explosive ordnance disposal (EOD) render safe procedures testing to ensure safe disposal procedures are safe and effective for EOD forces, based on updated target algorithms. Conduct system-level integration testing of CDM phase 2 using engineering design models to ensure TDD Mk 71 and remote control devices function as designed. Initiate safety qualification testing of updated fuze and battery components of CDM Phase 2. Conduct functional and reliability testing of prototype reversible fuze design for use with CDM. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The minimal increase in FY19 will support the completion of the aircraft certification of the B-52.					
Accomplishments/Planned Programs Subtotals	14.860	17.617	18.401	0.000	18.401

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 0267 / *Mine Improvements*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• WPN 3231: *Quickstrike Mine*	1.236	10.337	9.758	-	9.758	5.183	5.289	8.585	8.793	0.000	110.828

Remarks

D. Acquisition Strategy

Procurement of Target Detecting Device (TDD) Mk 71, MK 62/63 kits, MK 65, Clandestine Delivered Mine (CDM) kits and associated components.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604601N / *Mine Development*	Project (Number/Name) 0267 / *Mine Improvements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC PC : Panama City, FL	117.357	0.000		0.000		0.000		-		0.000	0.000	117.357	-
Ancillary Hardware Development	C/CPAF	Various : Various	4.062	0.050	Nov 2016	0.000		0.000		-		0.000	0.000	4.112	-
Software Development	WR	NSWC, PC : Panama City, FL	21.215	1.470	Oct 2016	2.050	Oct 2017	2.091	Oct 2018	-		2.091	0.000	26.826	-
Clandestine Mine	WR	NSWC, PC : Panama City, FL	4.518	2.182	Oct 2016	3.233	Oct 2017	2.847	Oct 2018	-		2.847	0.000	12.780	-
Clandestine Mine	WR	NSWC, IH : Indian Head, MD	4.988	2.487	Nov 2016	4.533	Nov 2017	5.750	Oct 2018	-		5.750	0.000	17.758	-
Clandestine Mine	C/CPFF	JHU/APL : Baltimore, MD	5.790	1.211	Dec 2016	2.168	Dec 2017	1.980	Dec 2018	-		1.980	0.000	11.149	-
Quickstrike JDAM	WR	NSWC PC : Panama City, FL	0.000	1.628	Jun 2017	0.000		0.000		-		0.000	0.000	1.628	-
Quickstrike JDAM	WR	NSWC IH : Indian Head, Md	0.000	1.647	Jun 2017	0.000		0.000		-		0.000	0.000	1.647	-
		Subtotal	157.930	10.675		11.984		12.668		-		12.668	0.000	193.257	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IA/ILS/Technical	WR	NSWC PC : Panama City, FL	0.872	0.060	Oct 2016	0.085	Nov 2017	0.090	Oct 2018	-		0.090	Continuing	Continuing	Continuing
		Subtotal	0.872	0.060		0.085		0.090		-		0.090	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Aircraft interface & survivability testing	WR	NSWC PC : Panama City, FL	0.000	4.065	May 2017	5.468	Oct 2018	3.715	Oct 2018	-		3.715	0.000	13.248	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604601N / *Mine Development*	Project (Number/Name) 0267 / *Mine Improvements*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NSWC IH : Indian Head, MD	0.000	0.000		0.000		1.843	Oct 2018	-		1.843	0.000	1.843	-
		Subtotal	0.000	4.065		5.468		5.558		-		5.558	0.000	15.091	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	C/CPAF	Various : Various	36.252	0.050	Dec 2016	0.050	Oct 2017	0.055	Oct 2018	-		0.055	0.000	36.407	-
Program Management Support	C/CPAF	Various : Various	0.728	0.000		0.020	Oct 2017	0.020	Nov 2018	-		0.020	Continuing	Continuing	Continuing
Travel	Various	NAVSEA : Washington DC	0.074	0.010	Sep 2017	0.010	Oct 2017	0.010	Oct 2018	-		0.010	Continuing	Continuing	Continuing
		Subtotal	37.054	0.060		0.080		0.085		-		0.085	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	195.856	14.860		17.617		18.401		-		18.401	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 0267 / *Mine Improvements*

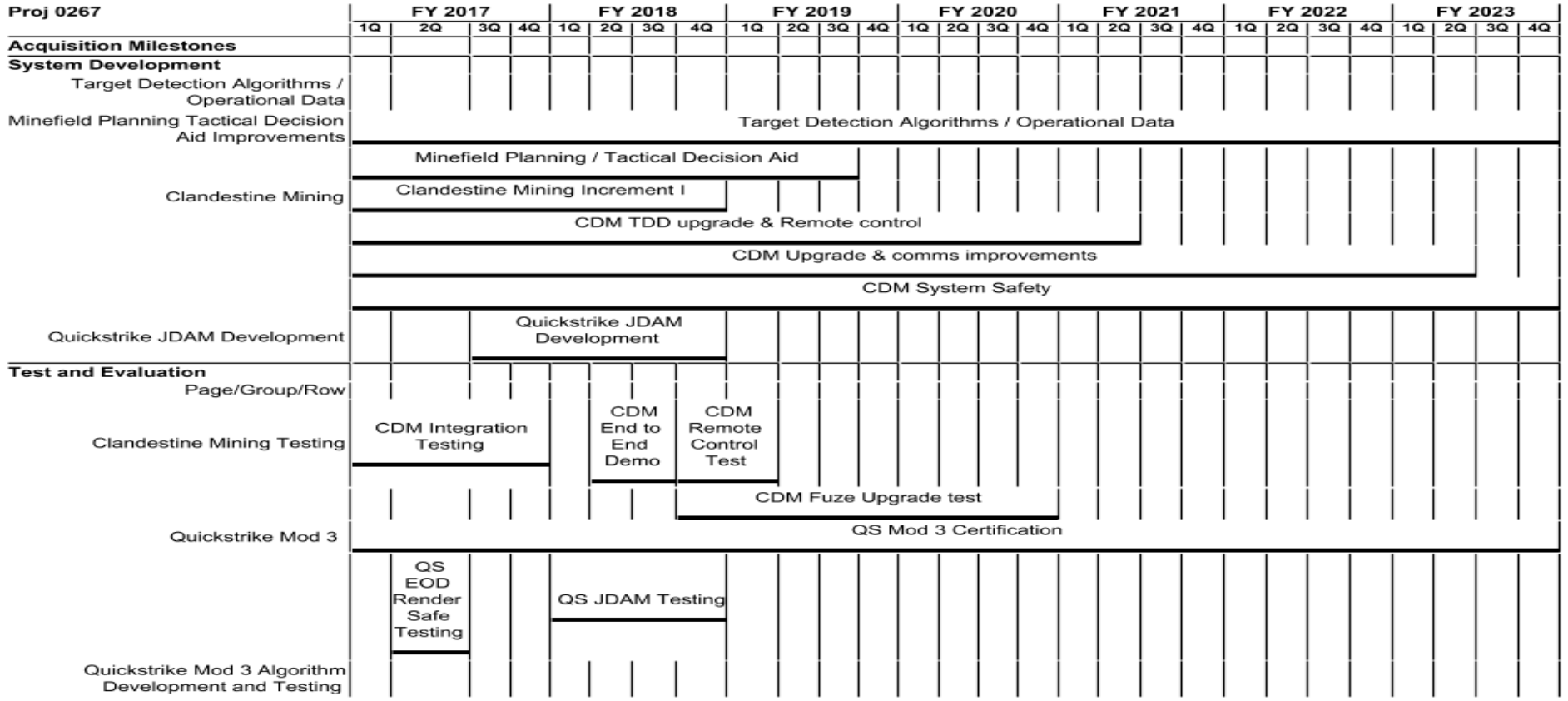


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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 0267 / *Mine Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0267				
System Development: Minefield Planning Tactical Decision Aid Improvements: Target Detection Algorithms / Operational Data	1	2017	4	2023
System Development: Minefield Planning Tactical Decision Aid Improvements: Minefield Planning / Tactical Decision Aid	1	2017	3	2019
System Development: Clandestine Mining: Increment I	1	2017	4	2018
System Development: Clandestine Mining: TDD upgrade & Remote control	1	2017	2	2021
System Development: Clandestine Mining: Fuze upgrade & comms improvement	1	2017	2	2023
System Development: Clandestine Mining: System Safety	1	2017	4	2023
System Development: Quickstrike JDAM Development: Quickstrike JDAM Development	3	2017	4	2018
Test and Evaluation: Clandestine Mining Testing: CDM Integration Testing	1	2017	4	2017
Test and Evaluation: Clandestine Mining Testing: End to End Demo	2	2018	3	2018
Test and Evaluation: Clandestine Mining Testing: Remote Control Test	4	2018	1	2019
Test and Evaluation: Clandestine Mining Testing: Fuze Upgrade Test	4	2018	4	2020
Test and Evaluation: Quickstrike Mod 3: QS Mod 3 Certification	1	2017	4	2023
Test and Evaluation: Quickstrike Mod 3: QS EOD Render Safe Testing	2	2017	2	2017
Test and Evaluation: Quickstrike Mod 3: QS JDAM Testing	1	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604601N / *Mine Development*				Project (Number/Name) 2993 / *Encapsulated Effector*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2993: *Encapsulated Effector*	0.000	0.000	8.018	7.355	-	7.355	6.861	2.410	10.841	11.063	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Encapsulated Effector transitions technology developed by the Advanced Undersea Weapon System (AUWS) enabling capability starting in FY18. The program provides maritime mining capability in intermediate water depths compared to existing bottom mines, uses existing kinetic payloads to engage enemy targets, and provides a wide area of coverage per each weapon. The program uses a weapon which is self-contained and is released when a target is detected and uses mobility to engage the target. The system uses modern sensing and processing technology to enable accurate targeting at increased range, incorporates remote control to allow operational flexibility to activate/deactivate and/or change targeting parameters, and maintain minefield resilience even as weapons are expended against targets. The result is expanded operating areas to restrict or deny adversary access to the intended area while using fewer weapons than traditional mines.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	0.000	7.853	7.185	0.000	7.185
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct engineering analysis to allocate requirements to subsystems, develop engineering architecture products, begin development of Systems Engineering Plan (SEP) and Test and Evaluation Master Plan (TEMP). Coordinate transition of technology products from the Office of Naval Research's Advanced Undersea Weapon System Future Naval Capability program. Establish system safety program to evaluate and mitigate hazards across the program lifecycle					
FY 2019 Base Plans: Conduct performance analysis and trade studies to develop a system level performance specification. Finalize SEP and TEMP documents to guide engineering planning. Define subsystem interfaces and develop interface control document between primary hardware components and selected weapon. Conduct preliminary hazard assessment of system architecture. Successfully achieve Milestone B in 3QFY19.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease from FY18 to FY19 is in accordance with planned program profile.					
Title: Support	0.000	0.085	0.090	0.000	0.090
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 2993 / *Encapsulated Effector*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Initiate cyber security analysis and documentation in support of the remote control of the Encapsulated Effector. ***FY 2019 Base Plans:*** Continue cyber security analysis and documentation in support of the remote control of the Encapsulated Effector. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The minimal increase in FY19 supports cyber security analysis.					
Title: Management: ***Articles:*** ***FY 2018 Plans:*** Program Management Support, contract support and Travel ***FY 2019 Base Plans:*** Program Management Support, contract support and Travel ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019	0.000 -	0.080 -	0.080 -	0.000 -	0.080 -
Accomplishments/Planned Programs Subtotals	0.000	8.018	7.355	0.000	7.355

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Encapsulated Effector plans to leverage Navy warfare center expertise to perform requirements analysis and engineering architecture design to identify mature technologies to meet the operational objectives. Those engineering products will be provided to a prime contractor for final system integration and testing. The contractor will be responsible for the final design to optimize producibility, manufacture engineering design models to be used during testing, and test planning and execution to gather the required data to support a production decision.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 2993 / *Encapsulated Effector*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604601N / *Mine Development*	Project (Number/Name) 2993 / *Encapsulated Effector*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NSWC PC : Panama City, FL	0.000	0.000		5.988	Nov 2017	5.150	Jan 2019	-		5.150	Continuing	Continuing	Continuing
Weapon Interfaces & Modifications	WR	NUWC NPT : Newport, RI	0.000	0.000		1.253	Dec 2017	1.435	Nov 2018	-		1.435	0.000	2.688	-
System Safety	WR	NSWC IHEODTD : Indian Head, MD	0.000	0.000		0.612	Nov 2017	0.600	Dec 2018	-		0.600	0.000	1.212	-
		Subtotal	0.000	0.000		7.853		7.185		-		7.185	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber / Tech support	WR	NSWC PC : Panama City, FL	0.000	0.000		0.085	Dec 2017	0.090	Nov 2018	-		0.090	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.085		0.090		-		0.090	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	C/CPAF	Various : Various	0.000	0.000		0.080	Dec 2017	0.080	Nov 2018	-		0.080	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.080		0.080		-		0.080	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		8.018		7.355		-		7.355	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 2993 / *Encapsulated Effector*

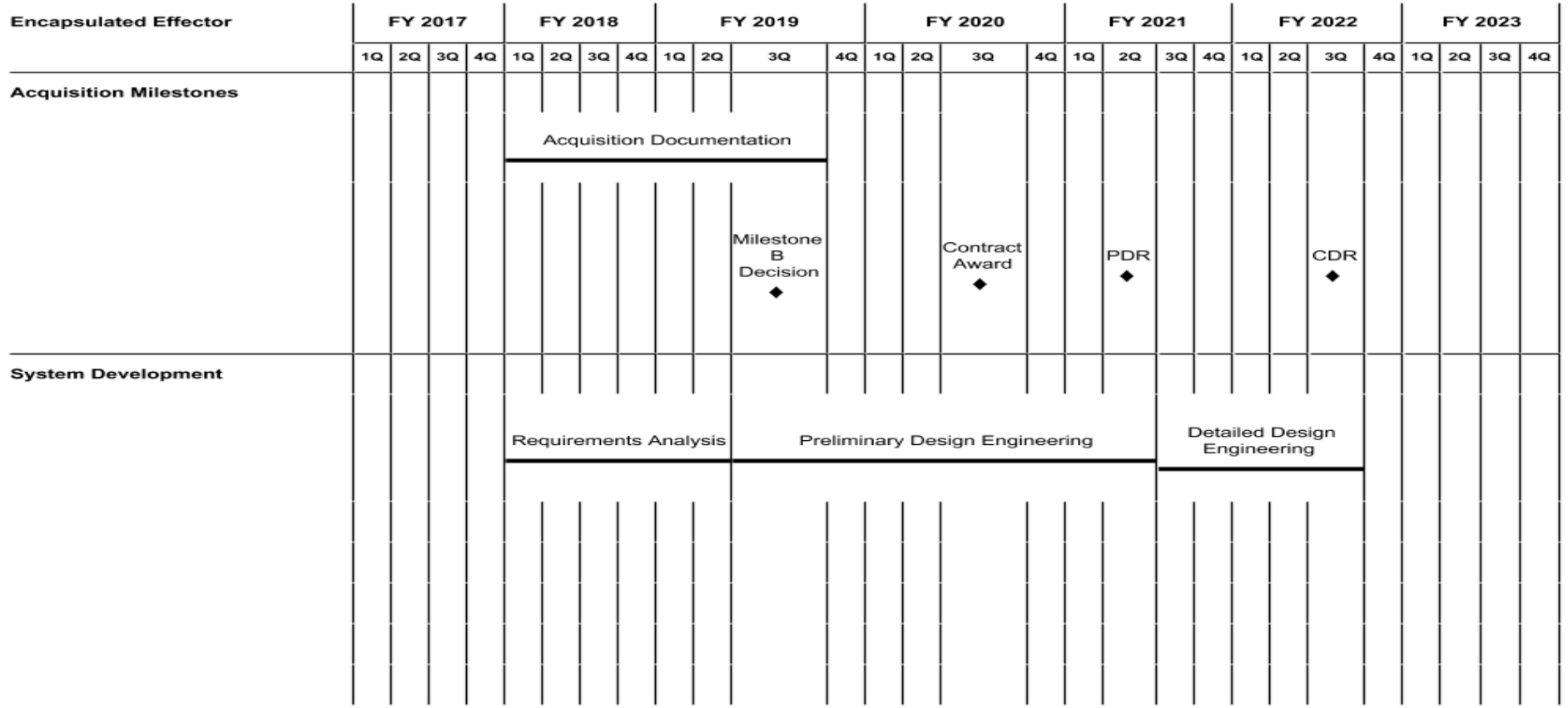

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604601N / *Mine Development*	**Project (Number/Name)** 2993 / *Encapsulated Effector*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Encapsulated Effector				
Acquisition Milestones: Acquisition Documentation	1	2018	3	2019
Acquisition Milestones: Milestone B Decision	3	2019	3	2019
Acquisition Milestones: Contract Award	3	2020	3	2020
Acquisition Milestones: Preliminary Design Review	2	2021	2	2021
Acquisition Milestones: Critical Design Review	3	2022	3	2022
System Development: Preliminary Design Engineering	3	2019	2	2021
System Development: Detailed Design Engineering	3	2021	3	2022
System Development: Requirements Analysis	1	2018	2	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604610N *I Lightweight Torpedo Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	344.930	29.567	28.076	95.147	-	95.147	159.755	146.173	98.632	92.390	Continuing	Continuing
1412: *HAAWC*	0.000	0.000	8.516	3.916	-	3.916	6.792	0.000	0.000	0.000	0.000	19.224
2234: *Lightweight Hybrid Torpedo*	325.605	19.896	19.560	22.831	-	22.831	18.468	17.204	14.229	14.587	Continuing	Continuing
3418: *Advanced Anti-Submarine Lightweight Torpedo*	0.000	0.000	0.000	68.400	-	68.400	134.495	128.969	84.403	77.803	Continuing	Continuing
9999: *Congressional Adds*	19.325	9.671	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.996

A. Mission Description and Budget Item Justification

The Lightweight Torpedo (LWT) program designs, integrates and tests the LWT MK 54. The LWT development program provides performance improvements in shallow water and counter-measure environments. The Engineering Development Model (EDM) contract has delivered 21 MK 54 MOD 1 EDM units to support the in-water test program. The EDM contract for the MK 54 MOD 1 was awarded to Progeny Systems Corporation in September 2008. The High Altitude Anti-Submarine Warfare Weapon Capability (HAAWC) development and Low Rate Initial Production (LRIP) contract was awarded to Boeing on April 2013. The Advanced Lightweight Torpedo effort has completed AoA and out briefed the selected material solution. The effort is currently in the program development and requirements phase for FY 2018.

Budget supports an incremental developmental acquisition approach combining hardware and Advanced Processor Build (APB) software upgrades to enable rapid fielding of improvements to the fleet. The program will focus on common LWT and Heavyweight Torpedo (HWT) hardware and software architecture enhancements that will provide re-architecture, broadband array improvements, and APB software improvements. Future APB software builds will utilize the common torpedo software to deliver capability and tactic improvements to the MK 54 LWT. The program will also support development of enhanced weapon delivery methods, including the high altitude launch of the MK 54 from the P-8A Maritime Patrol Reconnaissance Aircraft (MPRA) with the HAAWC.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604610N *I Lightweight Torpedo Development*

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	20.178	28.076	52.607	-	52.607
Current President's Budget	29.567	28.076	95.147	-	95.147
Total Adjustments	9.389	0.000	42.540	-	42.540
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.611	0.000			
• Rate/Misc Adjustments	0.000	0.000	42.540	-	42.540
• Congressional Add Adjustments	10.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *LWT SBIR (Cong)*	9.671	0.000
Congressional Add Subtotals for Project: 9999	9.671	0.000
Congressional Add Totals for all Projects	9.671	0.000

Change Summary Explanation

The FY 2019 funding request was reduced by $0.292 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

1412 High Altitude Anti-Submarine Warfare Weapon Capability (HAAWC)- Reduction of $0.172M in FY 2019 due to technical correction and miscellaneous purchase inflation rate adjustments.

2234 Lightweight Hybrid Torpedo - Overall program increase of $9.1M in FY 2019 is required for additional in-water runs, additional targets, and Fleet assets for Integrated Test (IT) events required to move IOC from FY 2023 to FY 2021.

3418 Advanced Anti-Submarine Lightweight Torpedo (ALWT)- Overall program increase of $33.5M in FY 2019 required to award and support ALWT development and award software and hardware development contracts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 1412 / *HAAWC*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1412: *HAAWC*	0.000	0.000	8.516	3.916	-	3.916	6.792	0.000	0.000	0.000	0.000	19.224
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The program will design, develop, and procure a High Altitude Anti-Submarine Warfare Weapon Capability (HAAWC) Air Launch Accessory (ALA) for the MK 54 Lightweight Torpedo (LWT). This capability will allow employment of the MK 54 outside the current fixed wing launch envelope. This includes the ability to employ the MK 54 LWT at high altitude, with stand-off ranges, and with the ability for precision guidance to the intended water entry point (WEP) without affecting the in-water operation of the LWT. This ALA is intended for employment with the Navy's latest Maritime Patrol and Reconnaissance Aircraft (MPRA), the P-8A Poseidon.

FY 2020 achievement of HAAWC IOC

HAAWC program was previously funded in FY 2016 - FY 2017 from Proj. 2234 Lightweight Hybrid Torpedo.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: High Altitude Anti-Submarine Warfare Weapon Capability (HAAWC) Development	0.000	8.516	3.916	0.000	3.916
Articles:	-	23	-	-	-
FY 2018 Plans:					
Milestone C Review					
Low Rate Initial Production (LRIP) 1 Award					
Conduct System Verification Review (SVR)					
Conduct Physical Configuration Audit (PCA)					
Conduct Flight Readiness Review (FRR)					
Conduct Integrated Testing with P-8A Platform.					
FY 2019 Base Plans:					
Continue Integrated Testing with P-8A Platform.					
Complete Operational test Readiness Review (OTRR)					
Begin Operational Testing (OT)					
Low Rate Initial Production (LRIP)2 Award					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 1412 / *HAAWC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 decrease Production Development funding as program transitions to Operational Testing (OT).					
Accomplishments/Planned Programs Subtotals	0.000	8.516	3.916	0.000	3.916

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• WPN/3215: *MK54 Torpedo Mods*	97.092	104.044	105.946	-	105.946	120.309	136.539	148.498	199.439	0.000	1,905.943

Remarks

D. Acquisition Strategy

The Engineering and Manufacturing Development (EMD) contract held by Boeing Company supports an incremental approach to delivering full HAAWC capability, Air Launch Accessory (ALA) assets and equipment, as well as associated engineering services and support. The schedule for the completion of the EMD phase of the MK 54 HAAWC AUR development is closely linked to the P-8A Increment 2 design and integration schedule. The EMD contract was awarded in April 2013, with options for the procurement of LRIP units. A future full rate production contract will be evaluated through market research and/or RFIs for competitive award. Contract award would be in FY 2020, upon successfully meeting IOC requirements and conducting a Full Rate Production Decision Review.

E. Performance Metrics

Milestone reviews
Program Management reviews
System engineering technical review

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 1412 / *HAAWC*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development - HAAWC	C/CPFF	Boeing : St. Louis, MO	0.000	0.000		5.585	Nov 2017	0.000	Dec 2018	-		0.000	0.000	5.585	-
Hardware Development - HAAWC	WR	NSWC : Indian Head, MD	0.000	0.000		0.040	Nov 2017	0.200	Nov 2018	-		0.200	0.000	0.240	-
Systems Engineering - HAAWC	WR	NSWC : Pax River, MD	0.000	0.000		0.475	Nov 2017	0.000	Nov 2018	-		0.000	0.000	0.475	-
Systems Engineering - HAAWC	WR	NAWC : China Lake, CA	0.000	0.000		0.740	Nov 2017	0.090	Nov 2018	-		0.090	0.000	0.830	-
Systems Engineering - HAAWC	WR	NUWC : Newport	0.000	0.000		0.000		0.340	Nov 2018	-		0.340	0.000	0.340	-
		Subtotal	0.000	0.000		6.840		0.630		-		0.630	0.000	7.470	N/A

Remarks

FY 2019 decrease Production Development funding as program transitions to Operational Testing (OT).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - HAAWC	WR	NUWC : Keyport	0.000	0.000		0.000		0.219	Nov 2018	-		0.219	0.000	0.219	-
		Subtotal	0.000	0.000		0.000		0.219		-		0.219	0.000	0.219	N/A

Remarks

Funding required for HAAWC documentation and systems engineering agent support.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test & Evaluation - HAAWC	C/CPFF	Boeing : St. Louis, MO	0.000	0.000		0.000		0.500	Dec 2018	-		0.500	0.000	0.500	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 1412 / *HAAWC*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test & Evaluation - HAAWC	WR	NUWC : Keyport, WA	0.000	0.000		0.525	Nov 2017	1.260	Nov 2018	-		1.260	0.000	1.785	-
System Test & Evaluation - HAAWC	C/BA	NUWC : Newport, RI	0.000	0.000		0.751	Nov 2017	0.000	Dec 2018	-		0.000	0.000	0.751	-
System Test & Evaluation - HAAWC	WR	NAWC : China Lake, CA	0.000	0.000		0.000		0.560	Nov 2018	-		0.560	0.000	0.560	-
System Test & Evaluation - HAAWC	WR	NAWC : Pax River, MD	0.000	0.000		0.000		0.297	Nov 2018	-		0.297	0.000	0.297	-
System Test & Evaluation - HAAWC	WR	OPTEVFOR : Norfolk, VA	0.000	0.000		0.400	Nov 2017	0.450	Dec 2018	-		0.450	0.000	0.850	-
		Subtotal	0.000	0.000		1.676		3.067		-		3.067	0.000	4.743	N/A

Remarks

FY 2019 increase in funding to support Operational Testing (OT) events.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		8.516		3.916		-		3.916	0.000	12.432	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 1412 / *HAAWC*

HAAWC Acquisition Schedule

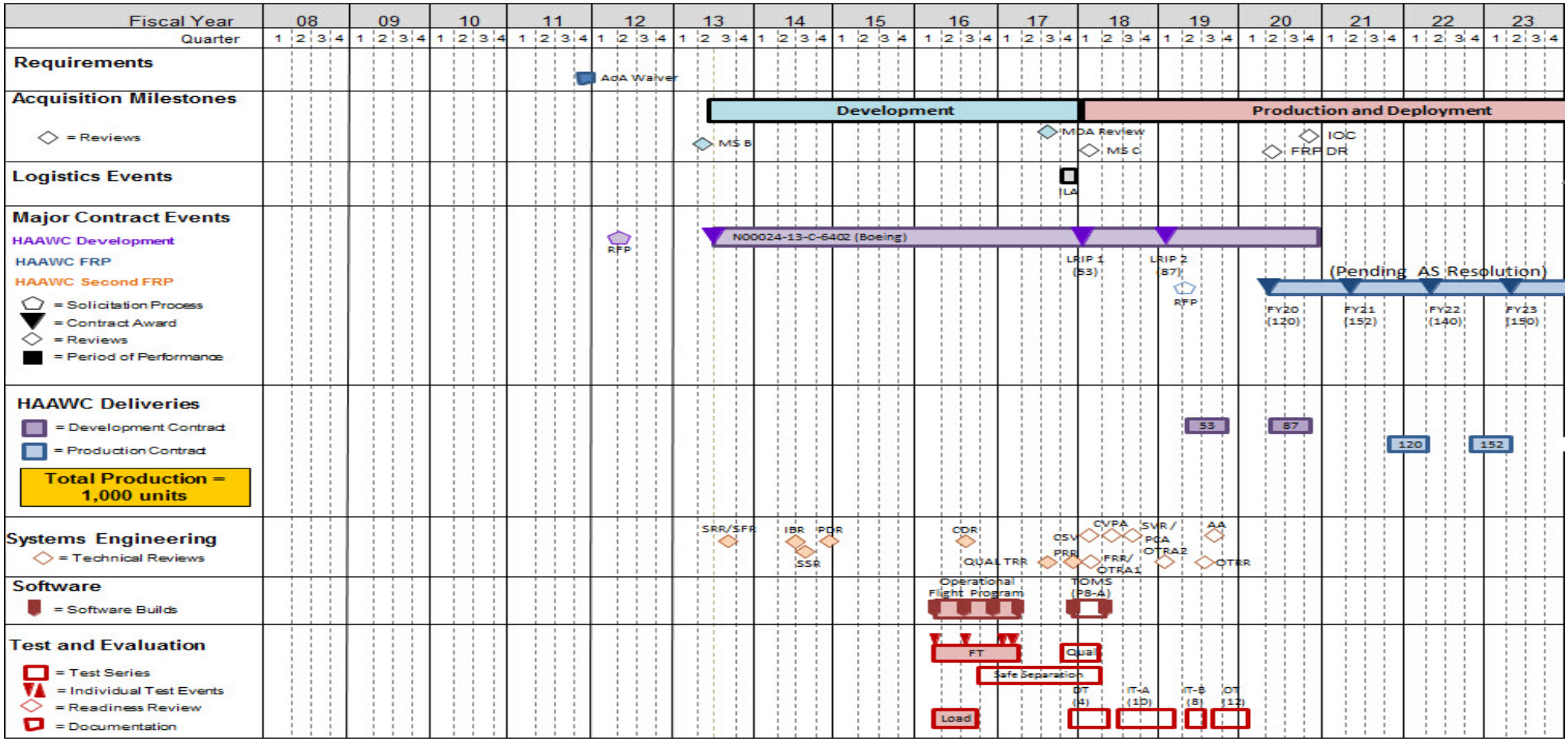


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 1412 / *HAAWC*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1412				
HAAWC Design/Development/Qualification: HAAWC Production Readiness Review	4	2017	4	2017
HAAWC Design/Development/Qualification: HAAWC MS C	1	2018	1	2018
HAAWC Design/Development/Qualification: HAAWC IT / OT	2	2018	2	2020
HAAWC Design/Development/Qualification: HAAWC IOC	4	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 2234 / *Lightweight Hybrid Torpedo*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2234: *Lightweight Hybrid Torpedo*	325.605	19.896	19.560	22.831	-	22.831	18.468	17.204	14.229	14.587	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The program designs, integrates and tests the LWT MK54. The LWT provides performance improvements in shallow water, counter-measure environments. The MK 54 MOD 1 program consists to two increments: 1) Advanced Processor Build (APB) 5/Tech Insertion 1 (TI1) and 2) APB-6 software upgrade.

FY 2021 achievement of MK 54 MOD 1 IOC

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: MK54 Pre-Planned Product Improvement	19.896	19.560	22.831	0.000	22.831
Articles:	-	-	-	-	-
FY 2018 Plans: Complete MK 54 MOD 1 DT Continue MK 54 MOD 1 Software Development Complete MS-B for ALWT					
FY 2019 Base Plans: Complete final MK54 MOD 1 INC 1 software build Conduct MK 54 MOD 1 IT Conduct MK54 MOD 1 Operational Test Readiness Review (OTRR)					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 increase in funding required for additional in-water runs, additional targets, and Fleet assets for Integrated Test (IT) events required to move IOC from FY 2023 to FY 2021.					
Accomplishments/Planned Programs Subtotals	19.896	19.560	22.831	0.000	22.831

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 2234 / *Lightweight Hybrid Torpedo*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• WPN/3215: *MK54 Torpedo Mods*	97.092	104.044	105.946	-	105.946	120.309	136.539	148.498	199.439	0.000	1,905.943

Remarks

D. Acquisition Strategy

Continue procurement until inventory requirements are met and all MK46 torpedoes are replaced with MK54. MK54 MOD 1 contract will leverage Phase III SBIR as a sole source justification. Execute life of type buys to reduce cost of redesign and requalification due to obsolescence. Next competitive contract for MK54 MOD 0 array is planned for FY 2018. Continue to incrementally develop technology to pace the threats.

E. Performance Metrics

Milestone reviews
System engineering technical review

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 2234 / *Lightweight Hybrid Torpedo*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development - PRIOR YEAR	WR	NUWC : Newport/ Keyport	47.640	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Hardware Development - MK 54 MOD 1	WR	NUWC : Newport	1.025	0.360	Oct 2016	2.973	Nov 2017	1.400	Nov 2018	-		1.400	0.000	5.758	-
Hardware Development - MK 54 MOD 1	SS/FP	Progeny Systems : Not Specified	24.394	0.000		0.000		0.000		-		0.000	0.000	24.394	-
Hardware Development - HAAWC	WR	NSWCCD : Carderock, MD	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
Hardware Development - HAAWC	C/CPAF	Boeing : St. Louis, MO	91.703	6.513	Oct 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Hardware Development - HAAWC	WR	NSWCDD : Dahlgren, VA	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
Hardware Development - HAAWC	WR	NSWC : Indian Head	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Hardware Development - INSENSITIVE MUNITIONS	WR	NUWC : Newport	0.210	0.210	Oct 2016	0.000		0.210	Jan 2019	-		0.210	0.000	0.630	-
Hardware Development - INSENSITIVE MUNITIONS	WR	NSWC : Indian Head, MD	0.240	0.240	Oct 2016	0.110	Jan 2018	0.150	Jan 2019	-		0.150	0.000	0.740	-
HHardware Development - INSENSITIVE MUNITIONS	WR	NUWC : Keyport	0.000	0.000		0.199	Nov 2017	0.196	Jan 2019	-		0.196	0.000	0.395	-
Hardware Development - PRIOR YEAR	WR	NSWC : Indian Head, MD	5.030	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development - PRIOR YEAR	WR	NUWC : Newport/ Keyport	20.454	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development - MK 54 MOD 1	WR	NUWC : Newport	0.010	0.000		0.415	Oct 2017	0.075	Nov 2018	-		0.075	0.000	0.500	-
Software Development - MK 54 MOD 1	MIPR	MIT : Boston, MA	1.010	0.348	Jan 2017	0.349	Feb 2018	0.000		-		0.000	0.000	1.707	-
Software Development - MK 54 MOD 1	C/BA	ARL/PSU : Philadephia, PA	0.408	0.213	Jan 2017	0.219	Jan 2018	0.000		-		0.000	0.000	0.840	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 2234 / *Lightweight Hybrid Torpedo*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - VLA	SS/FP	Lockheed Martin: VLA : Akron, OH	7.606	0.000		0.000		0.000		-		0.000	0.000	7.606	-
Systems Engineering - HAAWC	WR	NSWC PMA 290 : Patuxent, MD	8.582	1.000	Oct 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - HAAWC	WR	NAWCWD : China Lake	5.606	1.000	Oct 2016	0.000		0.000		-		0.000	0.000	6.606	-
Systems Enginnering - HAAWC	C/CPFF	John Hopkins University : Baltimore, MD	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
System Test & Evaluation - HAAWC	WR	NUWC : Newport/ Keyport	21.581	0.350	Oct 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Hardware Development - ADV LWT	WR	NUWC : Newport	0.000	0.000		2.040	Oct 2017	0.000		-		0.000	0.000	2.040	-
Hardware Development - ADV LWT	WR	NUWC : Keyport	0.000	0.000		0.213	Oct 2017	0.000		-		0.000	0.000	0.213	-
Hardware Development - ADV LWT	WR	NSWC : Indian Head, MD	0.000	0.000		0.575	Oct 2017	0.000		-		0.000	0.000	0.575	-
Software Development - APB 6	WR	NUWC : Newport	0.000	0.000		0.000		0.395	Dec 2018	-		0.395	0.000	0.395	-
		Subtotal	235.999	10.234		7.093		2.426		-		2.426	Continuing	Continuing	N/A

Remarks

- FY 2019 does not include funding for the Advanced Lightweight Torpedo (ALWT) post AoA requirements documentation and systems engineering development support. Starting in FY 2019, all ALWT tasks will be funded under Project Unit 3418.
- Decrease in required funds in FY 2019 as the program transitions to Operational Testing (OT)

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	WR	NUWC : Newport/ Keyport	4.347	1.000	Oct 2016	0.310	Nov 2017	0.000		-		0.000	0.000	5.657	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 2234 / *Lightweight Hybrid Torpedo*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NUWC : Newport/ Keyport	7.581	1.224	Oct 2016	2.605	Dec 2017	1.672	Nov 2018	-		1.672	0.000	13.082	-
Program Management Support	C/BA	ARL/PSU : Philadephia, PA	0.441	0.000		0.000		0.000		-		0.000	0.000	0.441	-
Program Management Support	Various	NAVSEA : Not Specified	0.168	0.000		0.000		0.000		-		0.000	0.000	0.168	-
Systems Engineering	WR	NUWC : Newport/ Keyport	0.120	0.000		0.000		0.235	Nov 2018	-		0.235	0.000	0.355	-
System Test and Evaluation	WR	NUWC : Newport/ Keyport	28.540	1.753	Oct 2016	2.507	Nov 2017	0.565	Nov 2018	-		0.565	Continuing	Continuing	Continuing
Hardware Development	WR	NSWC : Indian Head, MD	0.000	0.000		0.050	Oct 2017	0.000		-		0.000	0.000	0.050	-
Program Management Support	WR	NSWC : Indian Head, MD	0.000	0.000		0.200	Oct 2017	0.000		-		0.000	0.000	0.200	-
		Subtotal	41.197	3.977		5.672		2.472		-		2.472	Continuing	Continuing	N/A

Remarks

FY 2019 - $3.2M reduction for program management support and System T&E at NUWC Newport and NUWC Keyport.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering - MK 54 MOD 1	WR	NSWC : Carderock	1.259	0.000		0.000		0.000		-		0.000	0.000	1.259	-
System Test and Evaluation - PRIOR YEAR	WR	NUWC : Newport/ Keyport	32.191	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
System Test and Evalution - MK 54 MOD 1	WR	NUWC : Keyport	1.097	1.357	Oct 2016	2.481	Dec 2017	4.242	Jan 2019	-		4.242	0.000	9.177	-
System Test and Evaluation - MK 54 MOD 1	WR	NUWC : Newport	1.561	2.362	Oct 2016	2.889	Dec 2017	12.601	Nov 2018	-		12.601	0.000	19.413	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 2234 / *Lightweight Hybrid Torpedo*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test and Evaluation - MK 54 MOD 1	WR	NSWC : Indian Head, MD	1.343	0.233	Oct 2016	0.000		0.100	Nov 2018	-		0.100	0.000	1.676	-
System Test and Evaluation - MK 54 MOD 1	C/CPIF	ARL/PSU : Philadephia, PA	0.068	0.000		0.000		0.000		-		0.000	0.000	0.068	-
System Test and Evaluation - MK 54 MOD 1	WR	Aberdeen Test Center : Aberdeen, MD	0.731	0.000		0.000		0.000		-		0.000	0.000	0.731	-
System Test and Evaluation - MK 54 MOD 1	WR	OPTEVFOR : Not Specified	0.750	0.250	Oct 2016	0.416	Nov 2017	0.500	Nov 2018	-		0.500	0.000	1.916	-
System Test and Evaluation - PRIOR YEAR	WR	OPTEVFOR : Not Specified	3.490	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
System Test and Evaluation - HAAWC	WR	OPTEVFOR : Not Specified	0.250	0.500	Oct 2016	0.000		0.000		-		0.000	0.000	0.750	-
System Test and Evaluation - HAAWC	WR	NSWC : Dalgren, VA	0.091	0.000		0.000		0.000		-		0.000	0.000	0.091	-
System Test and Evaluation - HAAWC	WR	NUWC : Keyport	0.152	0.466	Oct 2016	0.000		0.000		-		0.000	0.000	0.618	-
System Test and Evaluation - HAAWC	WR	NUWC : Newport	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
System Test and Evaluation - WEAPON TRANSPORT	WR	NUWC : Keyport	0.026	0.027	Oct 2016	0.028	Oct 2017	0.000		-		0.000	0.000	0.081	-
System Test and Evaluation - ADV LWT	WR	NUWC : Newport	0.000	0.000		0.138	Oct 2017	0.000		-		0.000	0.000	0.138	-
System Test and Evalution - ADV LWT	WR	NUWC : Keyport	0.000	0.000		0.038	Oct 2017	0.000		-		0.000	0.000	0.038	-
System Test and Evaluation - ADV LWT	WR	NSWC : Indian Head, MD	0.000	0.000		0.075	Oct 2017	0.000		-		0.000	0.000	0.075	-
		Subtotal	43.009	5.195		6.065		17.443		-		17.443	Continuing	Continuing	N/A

Remarks

FY 2019: An increase of $11.3M is required for additional in-water runs, additional targets, and Fleet assets for Integrated Test (IT) events required to move IOC from FY23 to FY21.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 2234 / *Lightweight Hybrid Torpedo*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA : Washington, DC	0.459	0.028	Oct 2016	0.029	Jan 2018	0.028	Feb 2019	-		0.028	Continuing	Continuing	Continuing
Program Management Support	C/FPIF	EWCSS : Washington, DC	4.034	0.462	Oct 2016	0.701	Mar 2018	0.462	Feb 2019	-		0.462	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	ARL/PSU : Philadephia, PA	0.588	0.000		0.000		0.000		-		0.000	0.000	0.588	-
Program Management Support	Various	NAVSEA : Washington, DC	0.093	0.000		0.000		0.000		-		0.000	0.000	0.093	-
Acquisition Workforce Fund	Various	Not Specified : Not Specified	0.226	0.000		0.000		0.000		-		0.000	0.000	0.226	-
		Subtotal	5.400	0.490		0.730		0.490		-		0.490	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	325.605	19.896		19.560		22.831		-		22.831	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 2234 / *Lightweight Hybrid Torpedo*

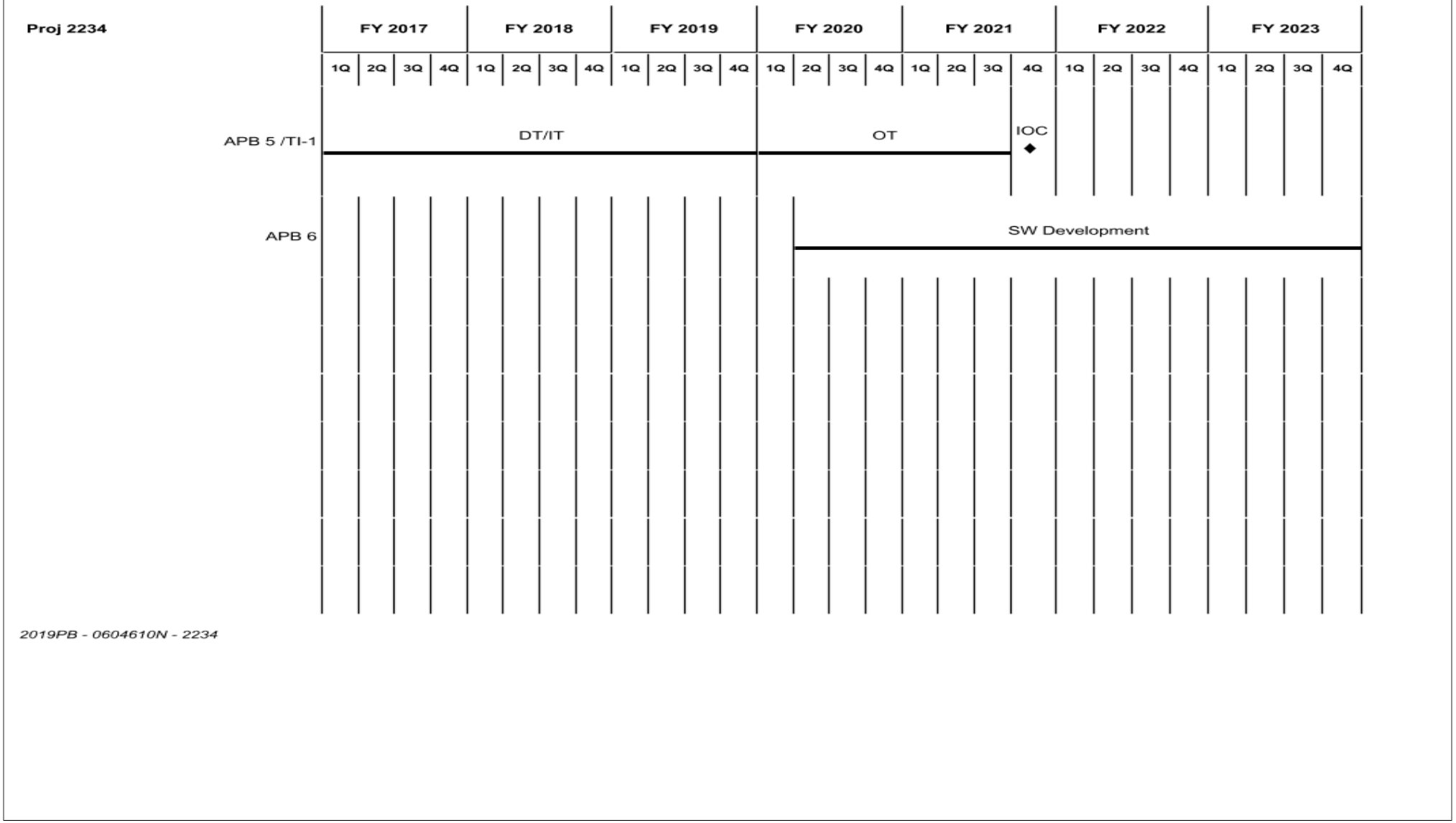


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 2234 / *Lightweight Hybrid Torpedo*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2234				
APB 5 /TI-1: Continue Tech Insertion 1 (TI-1) APB 5 / New Array DT to MK54 MOD 1	1	2017	4	2019
APB 5 /TI-1: Tech Insertion 1 (TI-1) APB 5 / New Array OT to MK54 MOD 1	1	2020	3	2021
APB 5 /TI-1: Tech Insertion 1 (TI-1) APB 5 / IOC	4	2021	4	2021
APB 6: APB 6 Development	2	2020	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 3418 / *Advanced Anti-Submarine Lightweight Torpedo*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3418: *Advanced Anti-Submarine Lightweight Torpedo*	0.000	0.000	0.000	68.400	-	68.400	134.495	128.969	84.403	77.803	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Developing an advanced lightweight torpedo (ALWT) capable of prosecuting challenging adversary submarine targets. The effort has completed Analysis of Alternatives (AoA) and out briefed the selected material solution. Improvements to various hardware subsystems were evaluated for performance improvements along with software and algorithm updates. The AoA completed 4Q FY 2017. In FY 2018, the continuation of acquisition program start and planning work will continue from a MK54 follow on study perspective. This will include specifications and requirements documentation, contract preparation, subsystem development efforts, and testing activities to support program start. FY 2019 will be the first year of funding that will allow for more detailed design and development work (HW/SW) to commence. Program has been re-phased adjusting the amounts over the FYDP.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: ALWT Development	0.000	0.000	68.400	0.000	68.400
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Conduct and closeout System Requirements Review (SRR). Start Software and Hardware prototype design and development. Conduct Engineering Testing Conduct System Functional Review (SFR).					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase funding for award and support for ALWT development and award hardware and software development contracts.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	68.400	0.000	68.400

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 3418 / *Advanced Anti-Submarine Lightweight Torpedo*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• WPN/3215: *MK-54 Torpedo Mods*	97.092	104.044	105.946	-	105.946	120.309	136.539	148.498	199.439	0.000	1,905.943

Remarks

D. Acquisition Strategy

The Acquisition Strategy is to use UARCs, Warfare Centers, and OTAs to develop the new Advanced Lightweight Torpedo. The program will also pursue accelerated acquisition opportunities that may serve as the contract award but still take into account competition.

E. Performance Metrics

Milestone reviews
System engineering technical review

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 3418 / *Advanced Anti-Submarine Lightweight Torpedo*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	WR	NUWC NPT : Newport, RI	0.000	0.000		0.000		13.200	Nov 2018	-		13.200	Continuing	Continuing	Continuing
Hardware Development	WR	NUWC KPT : Keyport, WA	0.000	0.000		0.000		5.550	Nov 2018	-		5.550	0.000	5.550	-
Hardware Development	WR	NSWC, IH : Indian Head, MD	0.000	0.000		0.000		17.050	Nov 2018	-		17.050	0.000	17.050	-
Hardware Development	C/CPIF	OTA : Multiple	0.000	0.000		0.000		14.900	Jun 2019	-		14.900	0.000	14.900	-
Hardware Development	C/CPFF	UARC : Multiple	0.000	0.000		0.000		16.600	Apr 2019	-		16.600	0.000	16.600	-
		Subtotal	0.000	0.000		0.000		67.300		-		67.300	Continuing	Continuing	N/A

Remarks

Funds required to award and support ALWT development and award hardware and software development contracts.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NUWC NPT : Newport, RI	0.000	0.000		0.000		0.400	Nov 2018	-		0.400	0.000	0.400	-
Program Management Support	WR	NUWC KPT : Keyport, WA	0.000	0.000		0.000		0.200	Nov 2018	-		0.200	0.000	0.200	-
		Subtotal	0.000	0.000		0.000		0.600		-		0.600	0.000	0.600	N/A

Test and Evaluation ($ in Millions)

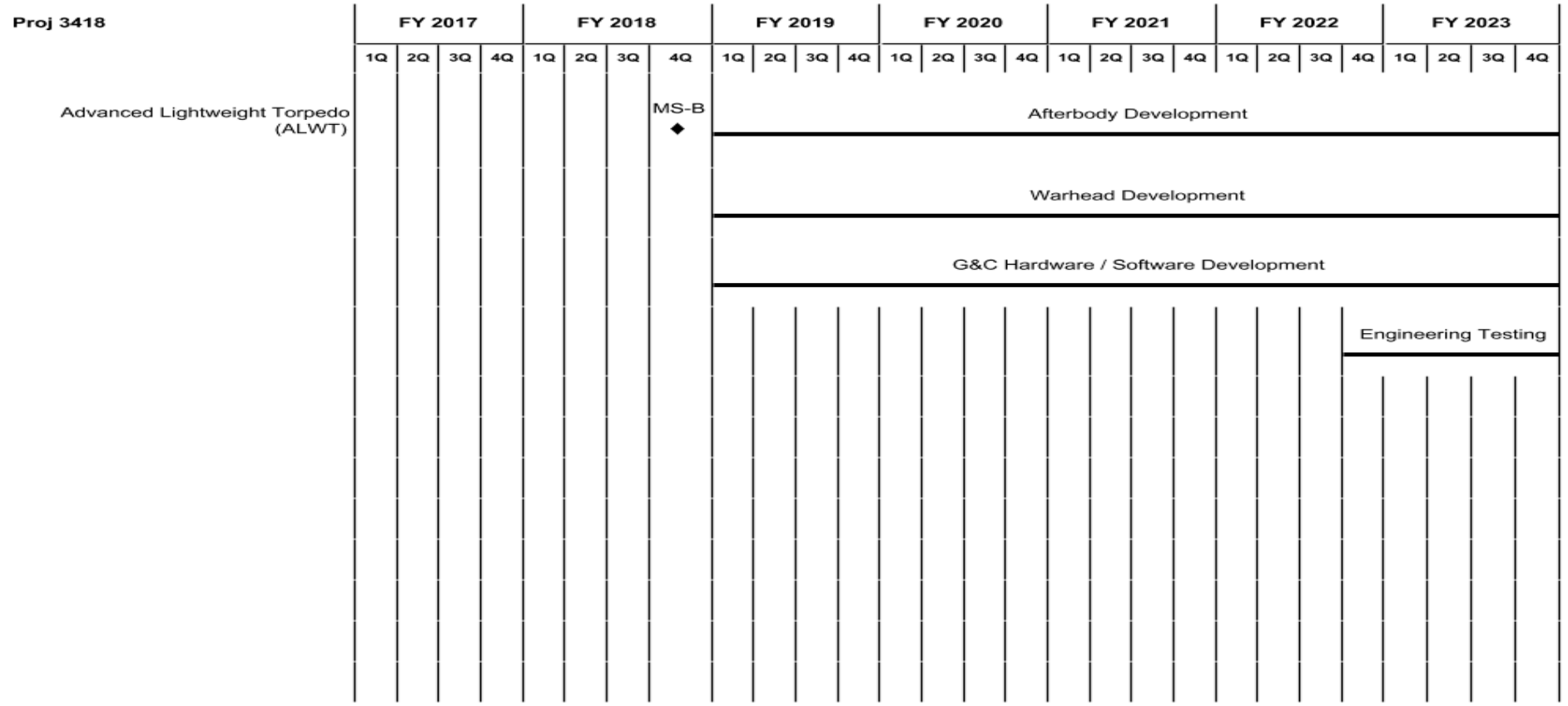
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test and Evaluation	WR	NUWC NPT : Newport, RI	0.000	0.000		0.000		0.500	Mar 2019	-		0.500	0.000	0.500	-
		Subtotal	0.000	0.000		0.000		0.500		-		0.500	0.000	0.500	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 3418 / *Advanced Anti-Submarine Lightweight Torpedo*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		68.400		-		68.400	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 3418 / *Advanced Anti-Submarine Lightweight Torpedo*



2019PB - 0604610N - 3418

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 3418 / *Advanced Anti-Submarine Lightweight Torpedo*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3418				
Advanced Lightweight Torpedo (ALWT): ALWT MS-B	4	2018	4	2018
Advanced Lightweight Torpedo (ALWT): ALWT Afterbody Development	1	2019	4	2023
Advanced Lightweight Torpedo (ALWT): ALWT Warhead Development	1	2019	4	2023
Advanced Lightweight Torpedo (ALWT): ALWT G&C Hardware / Software Development	1	2019	4	2023
Advanced Lightweight Torpedo (ALWT): ALWT Engineering Testing	4	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604610N / *Lightweight Torpedo Development*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	19.325	9.671	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.996
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add for Small Business Technology Insertion. This funding will support MK 54 MOD 1 related tasks to include cost reduction efforts, testing related analysis/development, and evaluation/analysis of processor group hardware.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: LWT SBIR (Cong) ***FY 2017 Accomplishments:*** Development of a second source MK54 MOD 1 array. ***FY 2018 Plans:*** N/A	9.671	0.000
Congressional Adds Subtotals	9.671	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Milestone reviews
System engineering technical review

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	WR	NUWC : Newport	6.855	0.000		0.000		0.000		-		0.000	0.000	6.855	-
Hardware Development	C/CPFF	Progeny : Not Specified	12.470	5.672	Aug 2017	0.000		0.000		-		0.000	0.000	18.142	-
		Subtotal	19.325	5.672		0.000		0.000		-		0.000	0.000	24.997	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Test & Evaluation	WR	NUWC, NPT : Newport, RI	0.000	2.924	Aug 2017	0.000		0.000		-		0.000	0.000	2.924	-
System Test & Evaluation	WR	NUWC, PT : Keyport, WA	0.000	1.000	Aug 2017	0.000		0.000		-		0.000	0.000	1.000	-
System Test & Evaluation	WR	NSWC, IH : Indian Head, MD	0.000	0.075	Aug 2017	0.000		0.000		-		0.000	0.000	0.075	-
		Subtotal	0.000	3.999		0.000		0.000		-		0.000	0.000	3.999	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	19.325	9.671		0.000		0.000		-		0.000	0.000	28.996	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
Producability Improvement, COTS Modernization, Test Equipment Upgrade					[redacted]																							

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604610N / *Lightweight Torpedo Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Producability Improvement, COTS Modernization, Test Equipment Upgrade	4	2017	4	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604654N *I JT Service EOD*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	299.803	7.369	7.561	7.107	-	7.107	7.416	7.537	7.696	7.853	Continuing	Continuing
1829: *Expl Ord Disp Proc*	299.803	7.369	7.561	7.107	-	7.107	7.416	7.537	7.696	7.853	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program provides for the development of key identification features and safety information used by Joint Service EOD personnel when performing their mission of detecting, locating, accessing, identifying, Render-Safe/Neutralize, and disposing or recovery of both foreign and domestic Unexploded Explosive Ordnance (UXO), Improvised Explosive Devices (IED), and Weapons of Mass Destruction (WMD) that pose a threat to military operations, installations, personnel, and materials.

In addition, EOD Render-Safe Procedures (RSP) of foreign ordnance and other explosive hazards must be developed as soon as possible after gaining knowledge of its existence. This effort requires acquisition, exploitation, and analysis of the foreign ordnance prior to the development of EOD procedures.

The program also provides for the development and evaluation of prototypical EOD Tier Two solutions sets for threats identified in the National Response Framework. This effort provides resources essential to the Foreign Threat Mine Acquisition/Exploitation (FTMA/E) program that includes; acquisition, inert certification, intelligence and operational exploitation, analysis, procedure development, and disposition of the highest priority foreign threat naval mines.

As defined in DOD Directive 5160.62, assigns the Secretary of the Navy (SECNAV) the responsibility of Single Manager for Explosive Ordnance Disposal (EOD) Technology and Training (T&T). The Executive Manager for EODT&T is to provide for the preparation, technical development, validation, Joint Service approval, and distribution of all EOD procedures and countermeasures to include; publications, manuals, bulletins, texts, and graphic aids.

This program is a non-acquisition program (without traditional acquisition milestones) with on-going, continuous delivery of urgent and periodic documented procedures and publications for mines, ordnance items, weapons systems, Improvised Explosive Devices, Weapons of Mass Destruction, and related explosive hazards.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604654N *I JT Service EOD*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	7.369	7.561	7.223	-	7.223
Current President's Budget	7.369	7.561	7.107	-	7.107
Total Adjustments	0.000	0.000	-0.116	-	-0.116
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.116	-	-0.116

Change Summary Explanation

Program Adjustments: reduced $116K for Other Rate/Misc Adjustments (MISC).
Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604654N / *JT Service EOD*	Project (Number/Name) 1829 / *Expl Ord Disp Proc*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1829: *Expl Ord Disp Proc*	299.803	7.369	7.561	7.107	-	7.107	7.416	7.537	7.696	7.853	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program provides for the development of key identification features and safety information used by Joint Service EOD personnel when performing their mission of detecting, locating, accessing, identifying, Render-Safe/Neutralize, and disposing or recovery of both foreign and domestic Unexploded Explosive Ordnance (UXO), Improvised Explosive Devices (IED), and Weapons of Mass Destruction (WMD) that pose a threat to military operations, installations, personnel, and materials.

In addition, EOD Render-Safe Procedures (RSP) of foreign ordnance and other explosive hazards must be developed as soon as possible after gaining knowledge of its existence. This effort requires acquisition, exploitation, and analysis of the foreign ordnance prior to the development of EOD procedures.

The program also provides for the development and evaluation of prototypical EOD Tier Two solutions sets for threats identified in the National Response Framework. This effort provides resources essential to the Foreign Threat Mine Acquisition/Exploitation (FTMA/E) program that includes; acquisition, inert certification, intelligence and operational exploitation, analysis, procedure development, and disposition of the highest priority foreign threat naval mines.

As defined in DOD Directive 5160.62, assigns the Secretary of the Navy (SECNAV) the responsibility of Single Manager for Explosive Ordnance Disposal (EOD) Technology and Training (T&T). The Executive Manager for EODT&T is to provide for the preparation, technical development, validation, Joint Service approval, and distribution of all EOD procedures and countermeasures to include; publications, manuals, bulletins, texts, and graphic aids.

This program is a non-acquisition program (without traditional acquisition milestones) with on-going, continuous delivery of urgent and periodic documented procedures and publications for mines, ordnance items, weapons systems, Improvised Explosive Devices, Weapons of Mass Destruction, and related explosive hazards.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Render-Safe Procedures Development	2.988	2.660	2.796	0.000	2.796
Articles:	-	-	-	-	-
FY 2018 Plans: Identify, analyze, exploit, and reverse engineer foreign and domestic conventional ordnance, munitions, weapons systems, and their associated explosive hazards, for the purpose of developing and or updating EOD render-safe and disposal procedures.					
FY 2019 Base Plans: Develop specific Explosive Ordnance Disposal (EOD) Technical Manuals which include the identification features, functionality, hazardous components, safeties and warnings, Render Safe and Disposal procedures, for					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604654N / *JT Service EOD*	**Project (Number/Name)** 1829 / *Expl Ord Disp Proc*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
U.S. and foreign ordnance items. Technical Manual development through the analysis, exploitation, and reverse engineering of these ordnance items. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Improvised Explosive Device (IED), Weapons of Mass Destruction (WM) Countermeasures ***Articles:*** ***FY 2018 Plans:*** Analyze and exploit IEDs and WMDs (to include chemical, biological, radiological, or nuclear weapons) threats for the purpose of developing and or updating EOD countermeasures and procedures to neutralize the threat. ***FY 2019 Base Plans:*** Develop Tactics, Techniques, and Procedures (TTP), and EOD Technical Manuals to counter Improvised Explosive Devices (IED), conventional and homemade explosive materials and their precursors, and Chemical, Biological, Nuclear, and Radiological (CBRN) agents and dispersal devices (both improvised and conventional). Additionally, develop Special Weapons Operation Publications (SWOP) publications as part of the Joint Nuclear Weapons Publication System (JNWPS) process. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY18 to FY19 is in accordance with planned program profile.	1.805 -	2.338 -	1.839 -	0.000 -	1.839 -
Title: Foreign Mine Acquisition ***Articles:*** ***FY 2018 Plans:*** Acquire high priority foreign threat naval mines for analysis and exploitation in support of development of EOD countermeasure procedures. ***FY 2019 Base Plans:***	2.576 -	2.563 -	2.472 -	0.000 -	2.472 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604654N / *JT Service EOD*	**Project (Number/Name)** 1829 / *Expl Ord Disp Proc*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Acquire foreign mines and mine related materials as prioritized by Foreign Mine Planning Group (FMPG) to support development of U.S. Navy countermeasures for these items and development of EOD Technical Manuals. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Accomplishments/Planned Programs Subtotals	7.369	7.561	7.107	0.000	7.107

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-acquisition program.

E. Performance Metrics

Analyzed and exploited foreign and domestic ordnance resulting in the development of 3,850 ordnance and weapons systems publications providing essential identification features, functioning characteristics, safety information and other EOD specific technical information to include 39 validated Render-Safe and Disposal procedures. Additionally, 400 Improvised Explosive Device (IED) and 117 Weapons of Mass Destruction (WMD) publications were developed or updated which included the development and validation of 6 EOD specific Render-Safe/Neutralization procedures.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604654N / *JT Service EOD*	**Project (Number/Name)** 1829 / *Expl Ord Disp Proc*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Foreign Mine Acquisition	WR	NSWCPC : PANAMA CITY, FL	10.201	2.556	Nov 2016	2.164	Nov 2017	1.984	Nov 2018	-		1.984	Continuing	Continuing	Continuing
Special Mission OCO	WR	EODTD : Indian Head, MD	3.500	0.000		0.000		0.000		-		0.000	0.000	3.500	-
Ordnance and Weapons Systems Procedures Development	WR	EODTD : Indian Head, MD	189.474	2.738	Nov 2016	2.660	Nov 2017	2.709	Nov 2018	-		2.709	Continuing	Continuing	Continuing
Improvised Explosive Device {IED}, Weapons of Mass Destruction {WMD} Countermeasures	WR	EODTD : Indian Head, MD	51.669	1.555	Nov 2016	2.131	Nov 2017	1.829	Nov 2018	-		1.829	Continuing	Continuing	Continuing
Foreign Mine Acquisition	WR	ONI : Suitland, MD	23.430	0.020	Nov 2016	0.025	Nov 2017	0.005	Nov 2018	-		0.005	Continuing	Continuing	Continuing
Program Management Personnel	WR	EODTD : Indian Head, MD	4.690	0.250	Nov 2016	0.275	Oct 2017	0.280	Nov 2018	-		0.280	Continuing	Continuing	Continuing
Miscellaneous	WR	EODTD : Indian Head, MD	16.839	0.250	Nov 2016	0.306	Nov 2017	0.300	Nov 2018	-		0.300	Continuing	Continuing	Continuing
		Subtotal	299.803	7.369		7.561		7.107		-		7.107	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	299.803	7.369		7.561		7.107		-		7.107	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604654N / *JT Service EOD*	**Project (Number/Name)** 1829 / *Expl Ord Disp Proc*

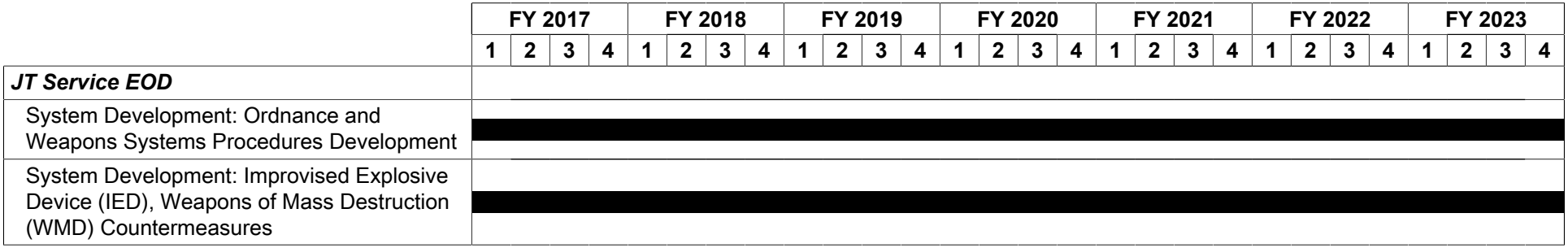


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604654N / *JT Service EOD*	**Project (Number/Name)** 1829 / *Expl Ord Disp Proc*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JT Service EOD				
System Development: Ordnance and Weapons Systems Procedures Development	1	2017	4	2023
System Development: Improvised Explosive Device (IED), Weapons of Mass Destruction (WMD) Countermeasures	1	2017	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604703N *I Personnel, Trng, Sim, & Human Factors*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	31.561	4.805	40.828	6.539	-	6.539	7.660	7.809	7.966	8.128	Continuing	Continuing
1822: *Manpower Pers & Human Fact System*	31.561	4.805	40.828	6.539	-	6.539	7.660	7.809	7.966	8.128	Continuing	Continuing

Note

Research and Development funds for Manpower, Personnel, Training and Education (MPT&E) Transformation under PE 0604703N have been consolidated within PE 0605013N Project Unit 2905 starting in FY19.

A. Mission Description and Budget Item Justification

This program is funded under RDT&E operational systems development because it encompasses engineering and development of new end-items prior to production approval decision and the upgrading and enhancement of existing Manpower, Personnel, Training and Education (MPT&E) decision support systems, tools and models.

This non-acquisition category program provides funds for continued R&D for broader application of advanced technologies to transition successful research proof-of-concept demonstrations into operational use. This Program Element (PE) provides funding to support the transition of models and decision support tools from RDT&E funded to production and into the hands of analysts and program managers throughout the Manpower, Personnel, Training and Education enterprise. The PE also supports the application of proven industry models, tools and methodologies to Navy MPT&E problems where government-off-the-shelf (GOTS) solutions are non-existent. The second goal of the PE is to successfully implement 90% of the industry-standard tools that are attempted to be used in Navy applications. In this case the Naval War College procuring and modifying an integrated, state-of-the-art information management / knowledge-management (IM / KM) system that environment that supports the College's unique educational and research activities. Informed by IM/KM best practices, elements of this environment will enhance the Naval War College (NWC) ability to achieve objectives in its mission areas of education, research, cooperative / international engagement, and combat readiness. This effort will allow NWC to support the Chairman Joint Chiefs of Staff (CJCS) vision for education as a career/lifelong learning endeavors, Navy's education strategy and CNO's Sailor 2025 initiative by dramatically increasing NWC communication of research, gaming and education results to the broader military and Navy communities.

Faced with complex challenges to efficiently and effectively attract, develop, and retain Navy Sailors, the Department has prepared an MPT&E Transformation plan to combat threats to mission readiness. The strategic vision and desired end-state of the endeavor is a holistic modernization of models, processes, and information technology, to dramatically improve the quality of MPT&E service delivery. There are too many Legacy IT Systems, an overly complex data management system, and limited Sailor-Self-Service options with no mobile access. The IT Transformation will focus on two primary strategies: maximizing the utilization of commercial-off-the-shelf (COTS) technologies and the implementation of cloud based technologies. Together these two approaches will improve both the service to Sailors and to Fleet readiness, reduce our technology footprint and increase accountability and audit readiness.

Research and Development funds for MPT&E Transformation under PE 0604703N have been consolidated within PE 0605013N Project Unit 2905 starting in FY19.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604703N *I Personnel, Trng, Sim, & Human Factors*

In accordance with the MPT&E transformation plan, legacy systems will be replaced by modern and robust solutions that better support Navy's ability to execute its mission and efficiently allocate its resources. The Department will provide the access, schematics, and other pertinent information regarding the existing architecture, artifacts, and visualizations to enable this transformation. Migrating the data housed within these disparate systems to centralized, COTS-configured applications will reduce costs, eliminate redundancy, and streamline processes in accordance with the goals set forth in the transformational effort strategy. There are four key activities that set the foundation for holistic MPT&E transformation:

1) Navy Personnel and Pay System (NP2) includes Navy Personnel and Pay (NP2)Standard modernization and the collapse of Legacy Manpower System functionality;

2) Single Point of Entry (SPOE) for Sailor self-service is composed of My Navy Portal (MNP), Identity and Access Management (IdAM), a Customer Relations Management (CRM) solution, and a centralized and standardized customer service center (The My Navy Career Center (MNCC));

3) Learning Stack (LS) improves the accessibility, sophistication, and collaborative nature of educational outreach;

4) Authoritative Data Environment (ADE) will enable the collapse of 9 legacy data warehouses into a single, authoritative source of data truth for Sailors and Navy decision makers. Additionally, ADE will enable modern data analytics and business intelligence capabilities.

All of the technology solutions will leverage hyperscale cloud based services in order to provide secure, accessible and cost effective business IT.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	18.995	40.828	7.012	-	7.012
Current President's Budget	4.805	40.828	6.539	-	6.539
Total Adjustments	-14.190	0.000	-0.473	-	-0.473
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.190	0.000			
• Program Adjustments	-14.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	-0.473	-	-0.473

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604703N *I Personnel, Trng, Sim, & Human Factors*

FY18 funding is required to address Studies and analysis in addition to the MPT&E Transformation plan. Transformation funds support Strategy, Architecture, Design, Requirements Definition, and Business Processes Re-Engineering for Single Point of Entry (SPOE), Authoritative Data Environment (ADE), and MPT&E Core efforts. Continuing to maintain outdated software developed in obsolete programming languages presents an increasing demand on Navy resources that cannot be sustained in perpetuity. Integration and updated technology will enable Sailors to transmit decisions from a mobile environment and unlock data stores for leaders that will provide visibility to enable more effective and efficient management.

FY19 reflect a decrease of $454K for rate and miscellaneous adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	Project (Number/Name) 1822 / *Manpower Pers & Human Fact System*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1822: *Manpower Pers & Human Fact System*	31.561	4.805	40.828	6.539	-	6.539	7.660	7.809	7.966	8.128	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program is under RDT&E operational systems development because it encompasses engineering and development of new end-items prior to production approval decision and the upgrading and enhancement of existing Manpower, Personnel, Training and Education (MPT&E) decision support systems, tools and models.

This non-acquisition category program provides funds for continued R&D for broader application of advanced technologies to transition successful research proof-of-concept demonstrations into operational use. This Program Element (PE) provides funding to support the transition of models and decision support tools from RDT&E funded to production and into the hands of analysts and program managers throughout the Manpower, Personnel, Training and Education enterprise. The PE also supports the application of proven industry models, tools and methodologies to Navy MPT&E problems where government-off-the-shelf (GOTS) solutions are non-existent. The second goal of the PE is to successfully implement 90% of the industry-standard tools that are attempted to be used in Navy applications. In this case the Naval War College procuring and modifying an integrated, state-of-the-art information management / knowledge-management (IM / KM) system that environment that supports the College's unique educational and research activities. Informed by IM/KM best practices, elements of this environment will enhance the Naval War College (NWC) ability to achieve objectives in its mission areas of education, research, cooperative / international engagement, and combat readiness. This effort will allow NWC to support the Chairman Joint Chiefs of Staff (CJCS) vision for education as a career/lifelong learning endeavors, Navy's education strategy and CNO's Sailor 2025 initiative by dramatically increasing NWC communication of research, gaming and education results to the broader military and Navy communities.

Faced with complex challenges to efficiently and effectively attract, develop, and retain Navy Sailors, N1 has prepared an MPT&E Transformation plan to combat threats to mission readiness. The strategic vision and desired end-state of the endeavor is a holistic modernization of models, processes, and information technology, to dramatically improve the quality of MPT&E service delivery. There are too many Legacy IT Systems, an overly complex data management system, and limited Sailor-Self-Service options with no mobile access. The IT Transformation will focus on two primary strategies: maximizing the utilization of commercial-off-the-shelf (COTS) technologies and the implementation of cloud based technologies. Together these two approaches will improve both the service to Sailors and to Fleet readiness, reduce our technology footprint and increase accountability and audit readiness.

Research and Development funds for MPT&E Transformation under PE 0604703N have been consolidated within PE 0605013N Project Unit 2905 starting in FY19.

In accordance with the MPT&E transformation plan, legacy systems will be replaced by modern and robust solutions that better support Navy's ability to execute its mission and efficiently allocate its resources. N1 will provide the access, schematics, and other pertinent information regarding the existing architecture, artifacts, and visualizations to enable this transformation. Migrating the data housed within these disparate systems to centralized, COTS-configured applications will reduce costs, eliminate redundancy, and streamline processes in accordance with the goals set forth in the transformational effort strategy. There are four key activities that set the foundation for holistic MPT&E transformation:

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

1) Navy Personnel and Pay System (NP2) includes Navy Personnel and Pay (NP2)Standard modernization and the collapse of Legacy Manpower System functionality;

2) Single Point of Entry (SPOE) for Sailor self-service is composed of My Navy Portal (MNP), Identity and Access Management (IdAM), a Customer Relations Management (CRM) solution, and a centralized and standardized customer service center (The My Navy Career Center (MNCC));

3) Learning Stack (LS) improves the accessibility, sophistication, and collaborative nature of educational outreach;

4) Authoritative Data Environment (ADE) will enable the collapse of 9 legacy data warehouses into a single, authoritative source of data truth for Sailors and Navy decision makers. Additionally, ADE will enable modern data analytics and business intelligence capabilities.

All of the technology solutions will leverage hyperscale cloud based services in order to provide secure, accessible and cost effective business IT.

FY19 funding ($6.539M).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Manpower Pers & Human Fact System	3.296	5.728	6.539	0.000	6.539
Articles:	7	6	7	-	7
Description: This program is funded under RDT&E operational systems development because it encompasses engineering and development of new end-items prior to production approval decision and the upgrading and enhancement of existing Manpower, Personnel, Training, and Education (MPT&E) decision support systems, tools and models. This non-acquisition category program provides funds for continued R&D for broader application of advanced technologies to transition successful research proof-of-concept demonstrations into operational use. This Program Element (PE) provides funding to support the transition of models and decision support tools from RDT&E funded to production and into the hands of analysts and program managers throughout the MPT&E enterprise. The PE also supports the application of proven industry models, tools and methodologies to Navy MPT&E problems where government-off-the-shelf (GOTS) solutions are non-existent. Faced with complex challenges to efficiently and effectively attract, develop, and retain Navy Sailors, N1 has prepared an MPT&E Transformation plan to combat threats to mission readiness. The strategic vision and desired end-state of the endeavor is a holistic modernization of models, processes, and information technology, to dramatically improve the quality of MPT&E service delivery. There are too many Legacy IT Systems, an overly complex data management system, and limited Sailor-Self-Service options with no mobile access. The IT Transformation will					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
focus on two primary strategies: maximizing the utilization of commercial-off-the-shelf (COTS) technologies and the implementation of cloud based technologies. Together these two approaches will improve both the service to Sailors and to Fleet readiness, reduce our technology footprint and increase accountability and audit readiness. In accordance with the MPT&E transformation plan, legacy systems will be replaced by modern and robust solutions that better support Navy's ability to execute its mission and efficiently allocate its resources. N1 will provide the access, schematics, and other pertinent information regarding the existing architecture, artifacts, and visualizations to enable this transformation. Migrating the data housed within these disparate systems to centralized, COTS-configured applications will reduce costs, eliminate redundancy, and streamline processes in accordance with the goals set forth in the transformational effort strategy. There are four key activities that set the foundation for holistic MPT&E transformation: - Establish a Core Suite of Integrated HR Business Systems (MPT&E Core) - Integrated pay and personnel system to make the navy system accurate, timely and audit ready. - Establish World Class Sailor Self Service and Single Point of Entry (SPOE) - Put the Sailor "on-line" and provide access to their records via their smart phone in a Sailor friendly way. SPOE provides a single Web, Mobile, and Telephonic gateway for Sailors, Fleet leaders, and HR Professionals to access personnel systems and services. SPOE includes the standup and launch of the MyNavy Career Center which replaces 64 legacy Personnel Service Detachments with 2 centralized, modern, Sailor friendly call and service centers. In addition to labor costs, stand-up of the MNCC requires minor upgrades existing Navy Call Center facilities (Telephony) and implementation of modern Customer Relations Management software to allow initiation, tracking, and resolution of personnel action requests. SPOE also includes the creation of a web and mobile enabled portal that provides single sign on access to MPT&E IT applications via identity and access management, ability to generate action and service requests via the underlying Customer Relations Management software, and ability to conduct most needed personnel system actions via self-service. - Conduct Strategy, Architecture, Design, Requirements Definition, and Business Processes Re-engineering (Support / Infrastructure) - Fundamentally automate manual, mundane, "business as usual" processes and procedures to dramatically improve performance and reduce costs. Shift away from Navy data centers to fee for service, cloud based hosting. - Establish an Authoritative Data Environment and Comprehensive Analytics (ADE) - Create a single source of data truth supporting HR systems and provide a full suite of prescriptive, predictive, and descriptive analytics to both leadership and Sailors alike. ADE provides an accelerated path to good data and good analytics enabling good decisions. A modern, scalable cloud-based data environment using an API layer to deliver on "single					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
source of truth" and adv. analytics (subsuming all other MPTE data sources); effort includes establishment of a data lake for analytics. Transformation leverages activities in existing programs of record and reshapes them to achieve a unified strategy and vision for IT and non-IT service delivery. Modernizing, integrating, and consolidating existing programs of record accelerates transformation while making the most of existing Navy resources. Additionally, transitioning legacy systems to COTS-configured applications will reduce costs, eliminate redundancy, and streamline processes in accordance with the goals set forth in the transformational effort strategy. ***FY 2018 Plans:*** - Continue Training and Supply Chain Management Decision Support Systems integration and transition - Continue Development of Training Capacity Tradeoff Model - Continue Enhancements of Products delivered via World Class Modeling - Continue Transition of Simulation Toolset for Analysis of Mission, Personnel, and Systems (STAMPS) Manpower Planning Optimization Tool (MPOT) into Navy Manpower Requirements System (NMRS) Advanced Analytics module. Within the STAMPS project are two sub-projects. One of the Projects was for the Acquisition Community called Platform Design Acquisition Toolset (PDAT) and the other was for MPOT. MPOT was to develop advanced analytic capabilities to enhance and replace the existing 40 year old ones associated with the Fleet Manpower Requirements Determination (FMRD) Process. These advanced analytics are intended to enable the user to tie work back to the work driver as outlined via the Required Operational Capabilities/Projected Operating Environment (ROC/POE) (watch standing, special evolutions, mission area), Own unit support, Preventive/ Corrective Maintenance, and other work categories. This is not possible with the current method It will employ advanced Goal Programming (multiple objective function) approach and solving in determining the statement of manpower and provide the user with a more accurate and higher fidelity solution and tie it to not only manpower costs, but via personnel costs as well through a newly developed 'Total Ownership Cost' model. The S&T portion conducted by ONR produced prototype tools to the Transitional Readiness Level (TRL) 6/7 level, the funds from this line will take the prototypes and fully 'scale' them to production versions suitable for insertion into a server or cloud environment for simultaneous use by multiple users. Current tool set is only available to a single user at a time. - Small Business Innovative Research (SBIR). - Continue Model Integration. Model integration is the Transition Tail for the Manpower, Personnel and Training Strategic Planning Application Science and Technology initiative that begins is FY17 and continue through FY19.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
This S&T initiative will develop a modeling integration architecture enabling the MPT&E Enterprise/domain to fully integrate their suite of models into a single environment. Products from the S&T initiative will be in spiral development and begin to be delivered in FY18. ***FY 2019 Base Plans:*** - Continue Training and Supply Chain Management Decision Support Systems integration and transition. - Continue Development of Training Capacity Tradeoff Model - Continue Enhancements of Products delivered via World Class Modeling - Complete Transition of Simulation Toolset for Analysis of Mission, Personnel, and Systems (STAMPS) Manpower Planning Optimization Tool (MPOT) into NMRS Advanced Analytics module - Small Business Innovative Research (SBIR). - Continue Model Integration (Model integration is the Transition Tail for the Manpower, Personnel and Training Strategic Planning Application Science and Technology initiative that begins is FY17 and continues through FY19. This S&T initiative will develop an modeling integration architecture enabling the MPT&E Enterprise/ domain to fully integrate their suite of models into a single environment. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $.811K is a result of additional studies and continued Training, Development and Product Enhancement that support MPT&E initiatives.					
Title: Transformation (MPTE Core)	1.509	15.100	0.000	0.000	0.000
Articles:	1	1	-	-	-
Description: MPT&E Core: Core technology includes Navy Standard Integrated Personnel System (NSIPS) and Learning Management System Distance Learning (LMS-DL). Most other legacy HR business systems will collapse into MPT&E Core. Supports an incremental roll-out of MPT&E enterprise solution (field test); Navy's consolidation efforts to migrate systems into the cloud; also includes contract support for a detailed plan and implementation efforts for the 55-1 rationalization plan, data integration, cloud adoption, technical architecture and system engineering support. Included in this is legacy decomposition that will include functional assessments, reviews of business processes and technical architecture. ***FY 2018 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
MPT&E Core - Accelerated Development Support for Transformation Pilot (Field Testing) - Continue Field Testing Phase 1 until completion and transition into Field Test Phase 2 in the series of incremental field tests. Completes Phase 1 Ensures target COTS software can provide accurate, auditable pay and personnel transactions for test group of 1500 Sailors. Live data run in parallel tests covering 22 of 81 rates. 60% of Pers & Pay Transactions covering Accession to 1st Fleet unit being tested. Validating data for output files. Evaluation of Phase 1 Required for risk reduction and requirements development. Transition to Field Test Phase 2 which includes all Officer and Enlisted, Active and Reserve actual records with live data run in parallel while testing 100% pay impacting personnel transactions. Phase 2 Field Test Targeted commercial-off-the-shelf (COTS) PeopleSoft (PS 9.2) + GlobalPay & Global Ledger, Commercial Cloud Environment. Validate external interfaces I/O and legacy NSIPS to Cloud for better integration to pay systems. Establish Treasury Direct interface. Integrate payroll into Financial Management Systems. ***FY 2019 Base Plans:*** Transformation funding will be executed under BSO39 beginning in FY19 and out. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in funding in the amount of $15.1K is a result of all Transformation funding will be executed under BSO39 beginning in FY19 and out.					
Title: Transformation Single Point of Entry (SPOE)	0.000	15.000	0.000	0.000	0.000
Articles:	-	2	-	-	-
FY 2018 Plans: Single Point of Entry (SPOE) provides a single Web, Mobile, and Telephonic gateway for Sailors, fleet leaders, and HR Professionals to access personnel systems and services. SPOE includes the following: -Standup and launch of the My Navy Career Center (MNCC) which replaces 64 legacy Personnel Service Detachments with 2 centralized, modern, Sailor friendly call and service centers. In addition to labor costs, stand-up of the MNCC requires minor upgrades to existing Navy Call Center facilities (Telephony) and implementation of modern Customer Relations Management (CRM) software to allow initiation, tracking, and resolution of personnel action requests.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Creation of a web and mobile enables portal that provides single sign on access to MPT&E IT applications via the underlying Customer Relations Management (CRM) Software, and ability to conduct most needed personnel system actions via self service. ***FY 2019 Base Plans:*** Transformation funding will be executed under BSO39 beginning in FY19 and out. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** All Transformation funding will be executed under BSO39 beginning in FY19 and out.					
Title: Transformation Authoritative Data Environment (ADE) ***Articles:*** ***FY 2018 Plans:*** ADE (Authoritative Data Environment) 2.0 Phase 1 Planning - Provides accelerated path to good data and good analytics enabling good decisions. Transformation Data and Analytics. ADE provides an accelerated path to good data and good analytics enabling good decisions. A modern, scalable cloud-based data environment using an API layer to deliver on "single source of truth" and advanced analytics (subsuming all other MPT&E data sources); effort includes establishment of a data lake for analytics. ***FY 2019 Base Plans:*** Transformation funding will be executed under BSO39 beginning in FY19 and out. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** All Transformation funding will be executed under BSO39 beginning in FY19 and out.	0.000 -	5.000 1	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	4.805	40.828	6.539	0.000	6.539

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

D. Acquisition Strategy

N/A

E. Performance Metrics

This Program Element (PE) provides funding to support the transition of models and decision support tools from RDT&E funded research, Science and Technology (6.2-6.3), to production and into the hands of analysts and program managers throughout the Manpower, Personnel, Training and Education enterprise. The PE also supports the application of proven industry models, tools and methodologies to Navy MPTE problems where GOTS solutions are non-existent. One goal of this PE is to transition 90% of successful S&T products to production while distributing 80% of successful educational and research products from the Naval War College (NWC) to a broader Navy audience to be used by USN Sailors and civilians. The second goal of the PE is to successfully implement 90% of the industry-standard tools that are attempted to be used in Navy applications and the existing NWC web based applications and products into the new information Management/knowledge Management (IM/KM) system for broader dissemination. This PE includes Transformation Strategy, Architecture, Design, Requirements Definition, and Business Processes Re-Engineering occurring primarily in BSO 22.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	Project (Number/Name) 1822 / *Manpower Pers & Human Fact System*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Allot	NPRST : Millington, TN	9.140	0.000	Oct 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development Support	Allot	CNP : Washington, DC	10.349	1.551	Jan 2017	2.028	Jan 2018	2.908	Jan 2019	-		2.908	Continuing	Continuing	Continuing
Development Support	Allot	NPC PMW-240 : Millington, TN	2.630	0.000		0.000		0.000		-		0.000	0.000	2.630	-
Development Support	Allot	NAWC-TSD : Orlando, FL	1.300	0.745	Jan 2017	1.900	Jan 2018	1.831	Jan 2019	-		1.831	Continuing	Continuing	Continuing
Development Support	Allot	SPAWAR : New Orleans, LA	2.300	1.000	Jan 2017	1.800	Jan 2018	1.800	Jan 2019	-		1.800	3.600	10.500	-
Development Support	Allot	NPC, HP Texas : Millington, TN	1.450	0.000		0.000		0.000		-		0.000	0.000	1.450	-
Development Support	Allot	CNRC PMW 240 : Millington, TN	3.700	0.000		0.000		0.000		-		0.000	0.000	3.700	-
Development Support	Allot	NWC : Newport, RI	0.692	0.000		0.000		0.000		-		0.000	0.000	0.692	-
Transformation SPOE Proof of Concept	Allot	PMW-240 : Various Locations	0.000	0.000		14.000	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Transformation ADE Data and Analytics	Allot	PMW-240 : Various Locations	0.000	0.000		5.000	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Transformation MPTE Core Pilot Launch	Allot	PMW-240 : Various Locations	0.000	1.509	Jul 2017	15.100	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Transformation SPOE PaaS Integration	Allot	PMW-240 : Millington, TN	0.000	0.000		1.000	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	31.561	4.805		40.828		6.539		-		6.539	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

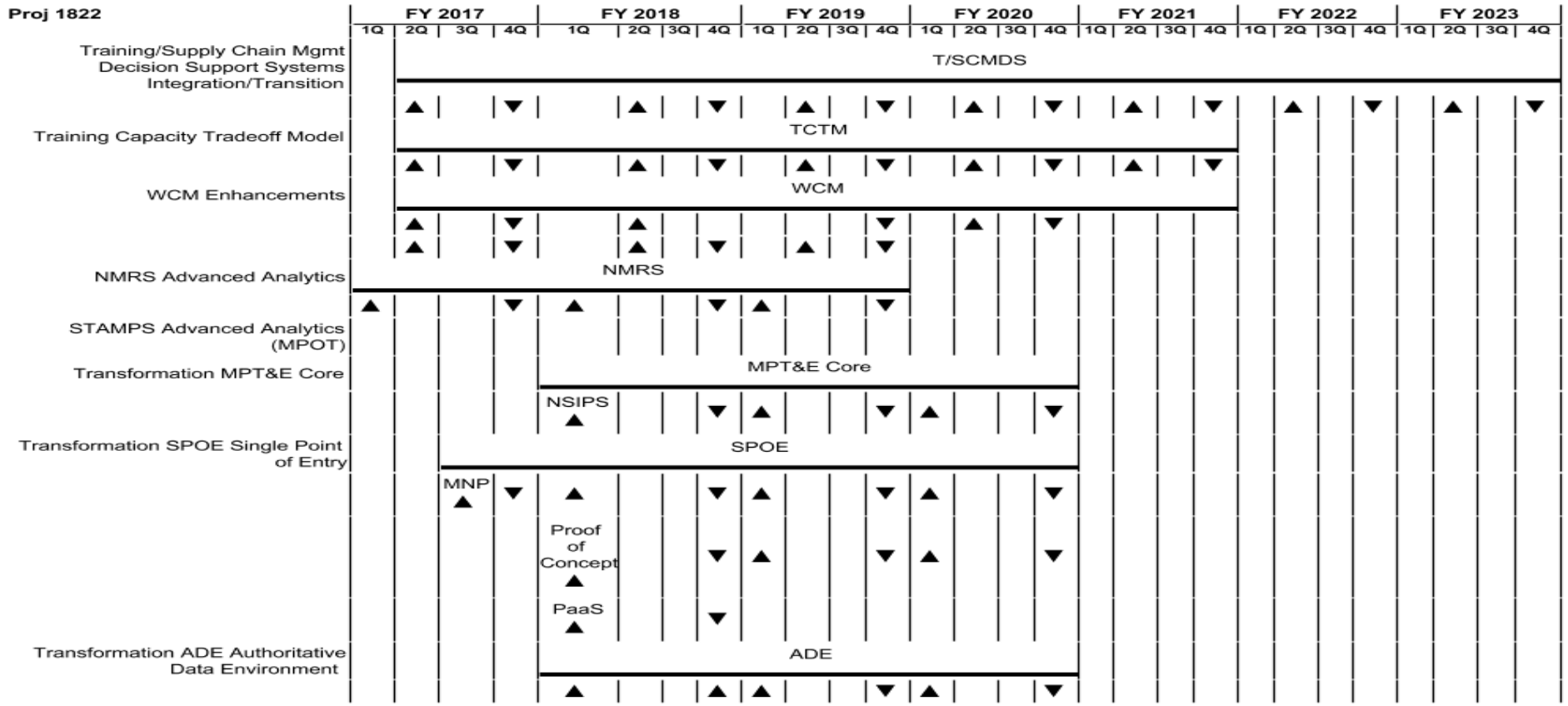
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	31.561	4.805		40.828		6.539		-		6.539	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*



2019DON - 0604703N - 1822

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1822				
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: Training/Supply Chain Mgmt Decision Support Systems Integration/Transition	2	2017	4	2023
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS 7	2	2017	2	2017
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS 8	4	2017	4	2017
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS 9	2	2018	2	2018
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS I0	4	2018	4	2018
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS I1	2	2019	2	2019
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS I2	4	2019	4	2019
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS I3	2	2020	2	2020
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS I4	4	2020	4	2020
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS 15	2	2021	2	2021
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS 16	4	2021	4	2021
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/SCMDS 17	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/ SCMDS 18	4	2022	4	2022
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/ SCMDS 19	2	2023	2	2023
Training/Supply Chain Mgmt Decision Support Systems Integration/Transition: T/ SCMDS 20	4	2023	4	2023
Training Capacity Tradeoff Model: Training Capacity Tradeoff Model	2	2017	4	2021
Training Capacity Tradeoff Model: TCTM 7	2	2017	2	2017
Training Capacity Tradeoff Model: TCTM 8	4	2017	4	2017
Training Capacity Tradeoff Model: TCTM 9	2	2018	2	2018
Training Capacity Tradeoff Model: TCTM 10	4	2018	4	2018
Training Capacity Tradeoff Model: TCTM 11	2	2019	2	2019
Training Capacity Tradeoff Model: TCTM 12	4	2019	4	2019
Training Capacity Tradeoff Model: TCTM 13	2	2020	2	2020
Training Capacity Tradeoff Model: TCTM 14	4	2020	4	2020
Training Capacity Tradeoff Model: TCTM 15	2	2021	2	2021
Training Capacity Tradeoff Model: TCTM 16	4	2021	4	2021
WCM Enhancements: WCM Enhancements	2	2017	4	2021
WCM Enhancements: WCM 3	2	2017	2	2017
WCM Enhancements: WCM 4	4	2017	4	2017
WCM Enhancements: WCM 5	2	2018	2	2018
WCM Enhancements: WCM 6	4	2019	4	2019
WCM Enhancements: WCM 7	2	2020	2	2020
WCM Enhancements: WCM 8	4	2020	4	2020
WCM Enhancements: WCM 9	2	2017	2	2017
WCM Enhancements: WCM 10	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
WCM Enhancements: WCM 11	2	2018	2	2018
WCM Enhancements: WCM 12	4	2018	4	2018
WCM Enhancements: WCM 13	2	2019	2	2019
WCM Enhancements: WCM 14	4	2019	4	2019
NMRS Advanced Analytics: NMRS Advanced Analytics	1	2017	4	2019
NMRS Advanced Analytics: NMRS 5	1	2017	1	2017
NMRS Advanced Analytics: NMRS 6	4	2017	4	2017
NMRS Advanced Analytics: NMRS 7	1	2018	1	2018
NMRS Advanced Analytics: NMRS 8	4	2018	4	2018
NMRS Advanced Analytics: NMRS 9	1	2019	1	2019
NMRS Advanced Analytics: NMRS 10	4	2019	4	2019
STAMPS Advanced Analytics (MPOT): STAMPS	1	2017	3	2018
Transformation MPT&E Core: Transformation MPT&E Core	1	2018	4	2020
Transformation MPT&E Core: Navy Standard Integrated Personnel System (NSIPS) 1	1	2018	1	2018
Transformation MPT&E Core: NSIPS 2	4	2018	4	2018
Transformation MPT&E Core: NSIPS 3	1	2019	1	2019
Transformation MPT&E Core: NSIPS 4	4	2019	4	2019
Transformation MPT&E Core: NSIPS 5	1	2020	1	2020
Transformation MPT&E Core: NSIPS 6	4	2020	4	2020
Transformation SPOE Single Point of Entry: Transformation SPOE	3	2017	4	2020
Transformation SPOE Single Point of Entry: My Navy Portal (MNP) 1	3	2017	3	2017
Transformation SPOE Single Point of Entry: MNP 2	4	2017	4	2017
Transformation SPOE Single Point of Entry: MNP 3	1	2018	1	2018
Transformation SPOE Single Point of Entry: MNP 4	4	2018	4	2018
Transformation SPOE Single Point of Entry: MNP 5	1	2019	1	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604703N / *Personnel, Trng, Sim, & Human Factors*	**Project (Number/Name)** 1822 / *Manpower Pers & Human Fact System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Transformation SPOE Single Point of Entry: MNP 6	4	2019	4	2019
Transformation SPOE Single Point of Entry: MNP 7	1	2020	1	2020
Transformation SPOE Single Point of Entry: MNP 8	4	2020	4	2020
Transformation SPOE Single Point of Entry: Peoplesoft 9,2 Proof of Concept 1	1	2018	1	2018
Transformation SPOE Single Point of Entry: Proof of Concept 2	4	2018	4	2018
Transformation SPOE Single Point of Entry: Proof of Concept 3	1	2019	1	2019
Transformation SPOE Single Point of Entry: Proof of Concept 4	4	2019	4	2019
Transformation SPOE Single Point of Entry: Proof of Concept 5	1	2020	1	2020
Transformation SPOE Single Point of Entry: Proof of Concept 6	4	2020	4	2020
Transformation SPOE Single Point of Entry: Transformation Platform as a Service (PaaS) 1	1	2018	1	2018
Transformation SPOE Single Point of Entry: PaaS 2	4	2018	4	2018
Transformation ADE Authoritative Data Environment: Transformation ADE Authoritative Data Environment	1	2018	4	2020
Transformation ADE Authoritative Data Environment: ADE 1	1	2018	1	2018
Transformation ADE Authoritative Data Environment: ADE 2	4	2018	4	2018
Transformation ADE Authoritative Data Environment: ADE 3	1	2019	1	2019
Transformation ADE Authoritative Data Environment: ADE 4	4	2019	4	2019
Transformation ADE Authoritative Data Environment: ADE 5	1	2020	1	2020
Transformation ADE Authoritative Data Environment: ADE 6	4	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604727N *I Joint Standoff Weapon Systems*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	898.325	0.396	0.435	0.441	-	0.441	0.439	0.448	0.457	0.465	3.005	904.411
2068: *Joint Standoff Weapon (JSOW)*	898.325	0.396	0.435	0.441	-	0.441	0.439	0.448	0.457	0.465	3.005	904.411

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 766

A. Mission Description and Budget Item Justification

The Joint Standoff Weapon (JSOW) is an air-to-ground weapon designed to attack a variety of targets during day, night, and adverse weather conditions. JSOW will enhance aircraft survivability as compared to current interdiction weapon systems by providing the capability for launch aircraft to standoff outside the range of most target area surface-to-air threat systems. The JSOW launch-and-leave capability will allow several target kills per aircraft sortie. The JSOW program first developed a baseline weapon for use against fixed area targets. JSOW is a Navy led joint Navy/Air Force program. JSOW utilizes a "common truck" for both AGM-154A and AGM-154C variants. Through adherence to international standards for weapons interfaces, weight, and dimension considerations, JSOW is compatible with Air Force and North Atlantic Treaty Organization aircraft.

The JSOW Baseline (AGM-154A) variant includes a kinematically efficient airframe, an integrated Inertial/Global Positioning System navigation capability, and a BLU-97/B payload. This weapon was designed up front for pre-planned product improvements. The JSOW BLU-108 (AGM-154B) variant incorporates the sensor fuze weapon submunition (BLU-108) into the baseline vehicle. The JSOW Unitary (AGM-154C) variant has a terminal seeker, autonomous target acquisition capability, and a broach lethal package to enable the attack of blast/fragmentation and penetration type targets. The JSOW Unitary provides increased accuracy and lethality and the capability for aimpoint selection. Operational Testing of the JSOW-C was successfully completed in December 2004. Approval for Milestone-III/Full Rate Production was granted on 20 December 2004. JSOW-C Initial Operational Capability was achieved in February 2005.

The JSOW Unitary (AGM-154C-1) variant includes a Network Enabled Weapon moving maritime target capability. The AGM-154C-1 capability enables the weapon to be integrated with the network and attack sea moving maritime targets via real-time pre-and post-launch targeting updates. JSOW will continue to conduct analysis and development of solutions to system integration challenges, and continual enhancement of warfighter effectiveness in the employment of the JSOW weapon system. JSOW funding will provide enhancements to include the analysis of extended range and future improvements to the JSOW-C configuration to improve capability. The FY 2019 funding includes the integration of new functionality into the joint mission planning systems and precision guided munitions planning system. JSOW C-1 Initial Operational Capability was achieved in June 2016. JSOW C-1 Full Operational Capability was achieved in August 2017.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604727N *I Joint Standoff Weapon Systems*

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.412	0.435	0.445	-	0.445
Current President's Budget	0.396	0.435	0.441	-	0.441
Total Adjustments	-0.016	0.000	-0.004	-	-0.004
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.016	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.004	-	-0.004

Change Summary Explanation

The FY 2019 funding request was reduced by $0.001 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Schedule:
Production shutdown costs removed due to line remaining open for FMS requirements.

Technical: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604727N / *Joint Standoff Weapon Systems*	Project (Number/Name) 2068 / *Joint Standoff Weapon (JSOW)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2068: *Joint Standoff Weapon (JSOW)*	898.325	0.396	0.435	0.441	-	0.441	0.439	0.448	0.457	0.465	3.005	904.411
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 766

A. Mission Description and Budget Item Justification

Provides funds for the development of a weapon to be employed by aircraft to attack targets during day, night, and adverse weather conditions. The JSOW design will capitalize on aircraft sensor capabilities and minimize individual weapon sophistication, reducing unit cost and provides a significant increase in strike warfare capability. Excludes civilian and military manpower and their related costs and military construction costs which are included in appropriate management and support elements in this program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JSOW Mission Planning Systems	0.396	0.435	0.441	0.000	0.441
Articles:	-	-	-	-	-
Description: Incorporates mission planning into the JSOW and develops new software releases. Address new mission planning functionality related to the incorporation of the NEW moving target capability into the JSOW-C-1 weapons. ***FY 2018 Plans:*** Continue interoperability efforts for JSOW C-1. ***FY 2019 Base Plans:*** Continue interoperability efforts for JSOW C-1. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to inflation of 2%.					
Accomplishments/Planned Programs Subtotals	0.396	0.435	0.441	0.000	0.441

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604727N / *Joint Standoff Weapon Systems*	**Project (Number/Name)** 2068 / *Joint Standoff Weapon (JSOW)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• USN WP,N BLI 223000: *JSOW*	2.232	5.487	1.330	-	1.330	0.000	0.000	0.000	0.000	0.000	2,276.578

Remarks

FY19 funding is required for Telemetry Instrumentation Kit (TIK) efforts.

D. Acquisition Strategy

The contracting strategy for JSOW is planned to be sole source for the life of the program. Cost type contracts are utilized for the Engineering and Manufacturing Development and follow-on modification program (i.e., Block II (AGM-154C), AGM-154C-1) efforts. Component breakout is used, when possible, to promote full and open competition.

Fixed price type contracts are utilized for production.

E. Performance Metrics

The JSOW C-1 program is meeting the cost, schedule, performance, funding and life cycle sustainment in accordance with the Acquisition Program Baseline.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604727N / *Joint Standoff Weapon Systems*	Project (Number/Name) 2068 / *Joint Standoff Weapon (JSOW)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	MIPR	National Security Agency : Fort Meade, MD	1.259	0.000		0.000		0.000		-		0.000	0.000	1.259	-
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	802.617	0.000		0.000		0.000		-		0.000	0.000	802.617	-
		Subtotal	803.876	0.000		0.000		0.000		-		0.000	0.000	803.876	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	SS/CPFF	Various : Various	6.018	0.396	Apr 2017	0.435	Feb 2018	0.441	Mar 2019	-		0.441	4.814	12.104	12.165
Prior year Support no longer funded in the FYDP	Various	Various : Various	8.007	0.000		0.000		0.000		-		0.000	0.000	8.007	-
		Subtotal	14.025	0.396		0.435		0.441		-		0.441	4.814	20.111	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Oper Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	20.886	0.000		0.000		0.000		-		0.000	0.000	20.886	-
Prior year T&E no longer funded in the FYDP	WR	NAWCWD : China Lake, CA	34.034	0.000		0.000		0.000		-		0.000	0.000	34.034	-
		Subtotal	54.920	0.000		0.000		0.000		-		0.000	0.000	54.920	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604727N / *Joint Standoff Weapon Systems*	Project (Number/Name) 2068 / *Joint Standoff Weapon (JSOW)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Mgmt no longer funded in the FYDP	Various	Various : Various	25.504	0.000		0.000		0.000		-		0.000	0.000	25.504	-
		Subtotal	25.504	0.000		0.000		0.000		-		0.000	0.000	25.504	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	898.325	0.396		0.435		0.441		-		0.441	4.814	904.411	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604727N / *Joint Standoff Weapon Systems*	**Project (Number/Name)** 2068 / *Joint Standoff Weapon (JSOW)*

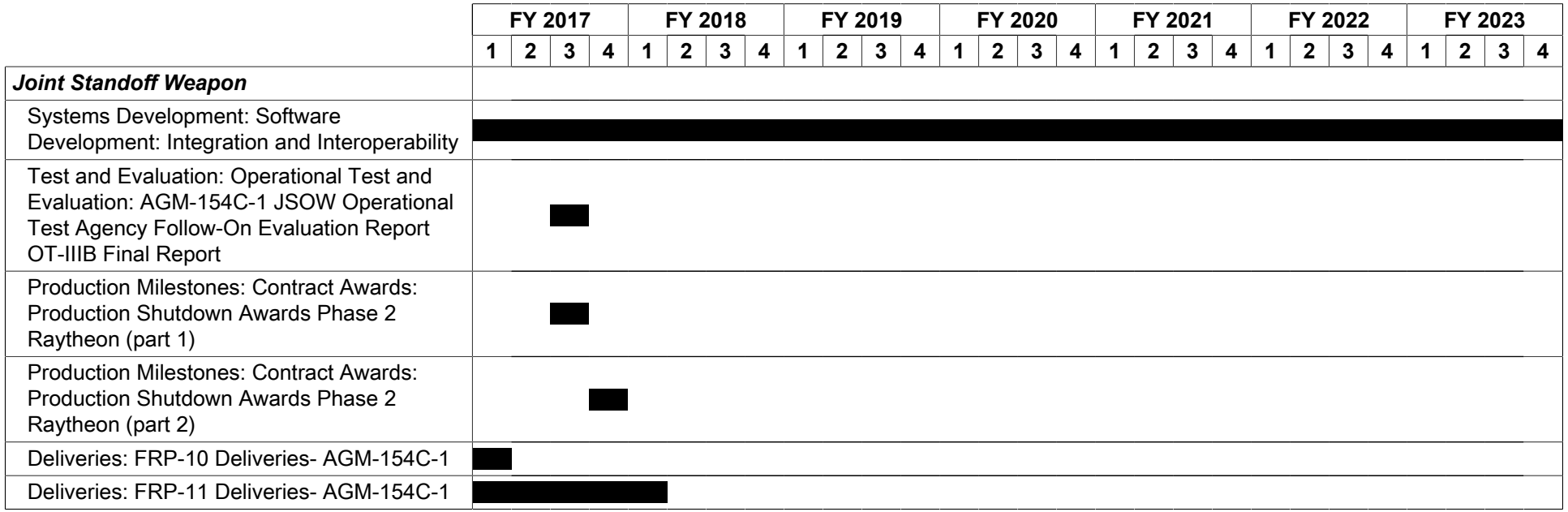


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604727N / *Joint Standoff Weapon Systems*	**Project (Number/Name)** 2068 / *Joint Standoff Weapon (JSOW)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Joint Standoff Weapon				
Systems Development: Software Development: Integration and Interoperability	1	2017	4	2023
Test and Evaluation: Operational Test and Evaluation: AGM-154C-1 JSOW Operational Test Agency Follow-On Evaluation Report OT-IIIB Final Report	3	2017	3	2017
Production Milestones: Contract Awards: Production Shutdown Awards Phase 2 Raytheon (part 1)	3	2017	3	2017
Production Milestones: Contract Awards: Production Shutdown Awards Phase 2 Raytheon (part 2)	4	2017	4	2017
Deliveries: FRP-10 Deliveries- AGM-154C-1	1	2017	1	2017
Deliveries: FRP-11 Deliveries- AGM-154C-1	1	2017	1	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604755N *I Ship Self Def (Detect & Cntrl)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,104.294	133.452	161.713	180.391	1.100	181.491	199.685	146.910	153.714	152.312	Continuing	Continuing
2178: *QRCC*	1,054.889	126.468	148.982	169.668	-	169.668	188.110	133.905	140.913	140.000	Continuing	Continuing
3172: *Joint Non-Lethal Weapons*	40.427	4.177	5.177	2.892	1.100	3.992	3.018	3.085	3.142	3.213	Continuing	Continuing
3358: *SSDS Training Improvement Program*	8.978	2.807	7.554	7.831	-	7.831	8.557	9.920	9.659	9.099	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.997 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

This program element consolidates efforts related to the integrated control of Ship Self Defense (SSD) and multi-warfare Combat Direction for Aircraft Carriers and Amphibious Class ships. Analysis and demonstration have established that surface SSD based on single-sensor detection point-to-point control architecture is inadequate against current and projected Anti-Ship Cruise Missile (ASCM) threats. The supersonic sea-skimming ASCM reduces the effective battle space to the horizon and the available reaction time-line to less than 30 seconds from first opportunity to detect until the ASCM impacts its target ship. Against such a threat, multi-sensor integration is required for effective detection, and parallel processing is essential to reduce reaction time to acceptable levels and to provide vital coordination/ integration of hard-kill and soft-kill assets. The program element also includes integrated Combat System embedded shipboard training, and Non-Lethal weapons in support of anti-terrorism/force protection missions.

Quick Reaction Combat Capability (QRCC, PU2178): This project provides for the evolutionary acquisition of the Ship Self Defense System (SSDS), the core combat system control element for the Quick Reaction Combat Capability (QRCC) in aircraft carriers and amphibious class ships. In addition, the project provides for Combat System Integration (CSI) with the central system engineering and software for the integration of advanced sensor, weapon and C4I upgrades, and for the test and evaluation and certification of the Integrated Combat System (ICS).

SSDS MK 2 integrates a diverse set of fire control loop sensors and weapons, and C4I systems for each ship class (CVN68/78, LHA6, LHD1, LPD17, and LSD41/49). SSDS MK2 provides the capabilities for integrated air and missile defense, multi-warfare situational awareness and combat direction, and joint interoperability via the Cooperative Engagement Capability (CEC) and Tactical Digital Information Link (TADL)-J. SSDS MK2 is being fielded with the new construction carriers (CVN78 class) and amphibious ships (LHA6, LPD17 classes). SSDS MK2 is replacing the Advanced Combat Direction System (ACDS) in the LHD1 class and SSDS MK1 in the LSD 41/49 class as fleet modernization initiatives. In addition, with the decision to replace the Dual Band Radar (DBR) for CVN 79/80 and Amphibious Class Ships (LHA 8) with an Enterprise Radar Suite (ERS), consisting of a new radar (Enterprise Air Search Radar)(EASR), and an X-Band Illuminator, SSDS will require development of system and software changes for ERS CSI.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604755N *I Ship Self Def (Detect & Cntrl)*

In order to meet the Navy's war fighting capabilities and modernization concepts described in SEA POWER 21, Navy Open Architecture (OA) is being introduced in conjunction with SSDS Commercial off the Shelf (COTS) Technology Refresh initiatives. This is the first step in unifying a set of war fighting functions into a common architecture shared among many ship classes. This principle of commonality is a major mechanism for cost control and avoidances in the Navy's future war fighting systems. Starting in 2008, SSDS MK 2 re-hosted existing tactical computer program applications into the Open Architecture Computing Environment (OACE) specifications with equipment suites concurrent with COTS Technology Insertion (TI) cycles, prior to migration and integration with other Navy OA applications for implementation on future new construction ships or during future ship modernization.

SSDS MK2 implements new combat system war-fighting capabilities and improvements on phased basis via Advanced Capability Builds (ACB) and Technology Insertion (TI). PU 2178 efforts are divided into three major functional areas: SSDS Product Development, Combat Systems Integration, and Test and Evaluation/ Certification.

The SSDS Product Development under PU 2178 encompasses systems engineering efforts, technology insertion and cyber-security, including the development and integration of ACB-12 with an Open Architecture Computing Environment (OACE), product line System Track Manager, and phased technology insertion configurations. CVN78 is the lead ship for ACB-12. For the CVN 78, FY 18-FY19 requires collaborative Combat System efforts to support CSSQT and DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group interoperability through extensive, Integrated Combat System (ICS) testing and software updates.

For Cyber-Security, the Boundary Defense Capability (BDC) initiative under PU 2178, will provide SSDS MK2 and Combat Systems-level cyber-security protection based on system of systems risk assessment. Cyber Security BDC is a phased multi-year development to define, develop, and integrate enterprise Combat System cyber-security solutions. These solutions will provide a set of boundary defense capabilities for the SSDS MK2 ICS, a set of centralized Combat Systems-level cyber-security capabilities, and a set of element-level cyber-security protections.

Combat System Integration under PU 2178 encompasses CS modeling and simulation, system analysis/engineering, and system/software development for integration of sensors, weapons and C4I systems with SSDS MK2 in the CVN and Amphibious Class Ships for integrated air and missile defense, ship self-defense, multi-warfare combat direction and strike group interoperability. Combat System Integration includes Fire Control Loop Improvement Project (FCLIP), Far-Term Interoperability Improvement Project (FTIIP), and ACB-20 war-fighting improvements, including the integration of EASR/ERS and integration of the Joint Strike Fighter (JFS) F35 variance B&C (Link 16 integration.
PU 2178 also includes the SSDS MK 2 Developmental Test/Operational Test (DT/OT) efforts and Combat System certification efforts.

Non-Lethal Weapons (PU 3172) - This project provides a long range laser warning and dazzle system, maritime vessel stopper system, and combined effects (light, laser, and sound) system for use in the maritime environment. Optical warning and distraction has been identified by the services as a possible technology solution to mitigate and/or address several known joint non-lethal capability gaps.

SSDS Training Improvement Program (PU 3358) - 3358 - SSDS Training Improvement Program provides enhancements and upgrades to the SSDS Total Ship Training Capability (TSTC) components within the combat system, combat system elements, Battle-Force Tactical Training (BFTT), and Advanced Training Domain (ATD) to

address needs for increased training capability and functionality in conjunction with SSDS MK2 Advanced Capability Builds (ACB)/Fire Control Loop Improvement Project (FCLIP), Far-Term Interoperability Improvement Project (FTIIP), Task Force Cyber Awakening (TFCA) Boundary Defense Capability (BDC), and Technical Insertion efforts under PU 2178 (QRCC). These enhancements will address current and future training requirements by implementing new functionality to enable the individual warfighter through distributed battle group events to engage in more complex training requirements to support fleet required training certification events. Capability Development and integration are related to Self Defense, Underwater, Surface, and other warfare areas. Capability enhancements and upgrades include development of re-useable common components that can be leveraged by SSDS MK2 combat systems, and/or integration of re-usable common components developed by the TSTC/BFTT Program and AEGIS Advanced Training Domain (ATD)/TSTC Total Ship Training Capability (TSTC) projects to meet AEGIS combat system training requirements. TSTC continues to integrate and update, as new tactical capabilities are being introduced, to enable crew operator proficiency training for basic and sustainment level training events, through distributed strike group certification fleet synthetic training (FST) events and including COMPTUEX FST at Sea integration into Live, Virtual and Constructive (LVC) environment. Continued Development is required to integrate new capabilities and interfaces to provide training for AEGIS and SSDS combat system capability upgrades, and to address the Fleet's Live, Virtual and Constructive (LVC) Fleet Training Wholeness initiative. Additionally, modernization is needed to support the DoD Training Transformation Plan, the Chief of Naval Operations Fleet Response Plan and Commander United States Fleet Forces Command Fleet Readiness Training Plan.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	134.619	161.713	135.374	-	135.374
Current President's Budget	133.452	161.713	180.391	1.100	181.491
Total Adjustments	-1.167	0.000	45.017	1.100	46.117
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.026	0.000			
• SBIR/STTR Transfer	-3.193	0.000			
• Program Adjustments	0.000	0.000	47.844	1.100	48.944
• Rate/Misc Adjustments	0.000	0.000	-2.827	-	-2.827

Change Summary Explanation

The FY 2019 budget request increased due to the initiation of the system engineering analysis for Joint Strike Fighter (JSF) F35B integration onboard LHA and LHD Class Ships, the F35B/C ICS Link 16 Integration, Cybersecurity Resiliency and Boundary Defense Capability (BDC) initiative to provide SSDS MK2 and Combat Systems-level cybersecurity protection based on system of systems risk assessment, and support to the CVN78 Wholeness - SSDS/Combat System Integration.

Added FY 2017 funding to support SSDS development, integration, test and certification in support of accelerated fielding of Identification Friend or Foe (IFF) Mode 5 on Carriers and L-Class ships. The SSDS effort required for IFF Mode 5 acceleration varies by platform so requires accelerated funding.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2178: *QRCC*	1,054.889	126.468	148.982	169.668	-	169.668	188.110	133.905	140.913	140.000	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The QRCC project (PU 2178) implements an evolutionary acquisition of improved ship self-defense capabilities against Anti-Ship Cruise Missiles (ASCMs), and improved multi-warfare capabilities, for Aircraft carriers and Amphibious Class ships. The SSDS is the integrating element of QRCC. The design integrates CS elements that do not individually provide the complete detection, control, and engagement capabilities needed against low flying, high speed ASCMs with low radar cross sections. The SSDS integration concept fulfills the need for an automated detection, quick reaction and multi-target engagement capability, emphasizing performance in the littoral environment. System design emphasizes use of non-developmental items, commercial standards, commercial processors, computer program reuse and open system architecture. SSDS is a physically distributed, open system architecture computer network consisting of commercially available or previously developed hardware. It includes the Navy's standard computers (Common Processor System) and displays (AN/UYQ-70 and Common Display System) and command table for human system interface, commercially based network switching and interface units, and commercially available fiber optic cabling.

SSDS MK1, the first generation of SSDS, integrates the SPS-49A(V)1 radar, SPS-67(V)1 radar, AN/SLQ-32A/B electronic warfare system, Combat Identification Friend or Foe-Self Defense (CIFF-SD), Rolling Airframe Missile (RAM) and Phalanx Close-In Weapon System (CIWS) and is installed on LSD41/49 class ships. SSDS MK1 successfully completed Operational Evaluation in June 1997. SSDS received Milestone III Approval for Full Rate Production (Mar 98) and authority to integrate with ACDS and Cooperative Engagement Capability (CEC) on CVN, LPD-17, LHD and LHA ship classes (as SSDS MK 2).
SSDS MK2 integrates other CS elements, such as AN/SPQ-9B radar, NATO Sea-sparrow system, CEC and TADIL-J for joint interoperability. SSDS MK2 provides enhanced capabilities for Self-Defense against air and surface threats using both own-ship and remote data to address AAW Capstone requirements. SSDS MK2 is the integrated, coherent real time Command and Control System for Aircraft Carriers and Amphibious Class ships.

SSDS MK 2 integrates a diverse set of fire control loop sensors and weapons, and C4I systems for each ship class (CVN68/78, LHA6, LHD1, LPD17, and LSD41/49). SSDS MK2 provides the capabilities for integrated air and missile defense, multi-warfare situational awareness and combat direction, and joint interoperability via the Cooperative Engagement Capability (CEC) and TADIL-J. SSDS MK2 is being fielded with the new construction carriers (CVN78 class) and amphibious ships (LHA6, LPD17 classes). SSDS MK2 is replacing the Advanced Combat Direction System (ACDS) in the LHD1 class and SSDS MK1 in the LSD 41/49 class as fleet modernization initiatives. In addition, with the decision to replace the Dual Band Radar (DBR) for CVN 79/80 and L-Class Ships (LHA 8) with an Enterprise Radar Suite (ERS), consisting of a new radar (Enterprise Air Search Radar (EASR), and an X-Band Illuminator, SSDS will require development of system and software changes for ERS Combat System Integration. The overall scope of the multi-year development for EASR/ERS integration will include systems engineering/analysis, M&S, hardware and software development, cyber-security implementation, Factory System Integration Test (FSIT) and Wrap Around Simulation, and Wallops Island integration and engineering Test for Fire Control Loop Elements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

SSDS MK2 implements new combat system war-fighting capabilities and improvements on phased basis via Advanced Capability Builds (ACB) and Technology Insertion (TI). PU 2178 efforts are divided into three major functional areas: SSDS Product Development, Combat Systems Integration, and Test and Evaluation/ Certification.

The SSDS Product Development encompasses systems engineering efforts, technology insertion and cyber-security, including the development and integration of ACB -12 with an Open Architecture Computing Environment (OACE), product line System Track Manager, and multiple technology insertion configurations. CVN78 is the lead ship for ACB-12. SSDS Product Improvement includes system engineering, critical experiments, software development, hardware development, operating environment, cyber-security software, hardware/software integration, factory qualification testing, land-based engineering testing, system/software Test Analyze and Fix (TAAF) effort in support of CS testing (CS integration, engineering, certification and at-sea testing), logistics products and ashore training course development.

Obsolescence of SSDS hardware impacts system production, maintainability and limits the ability of incorporating new capabilities. To combat obsolescence, new hardware TI baselines must be developed every four years, while each ship is planned for hardware modernization every eight to ten years. Due to prior year budget shortfalls, development of the TI-16 baseline was delayed. Obsolescence required a new hardware baseline be developed prior to the completion of TI-16 development. To address the obsolescence, the TI-12 hardware baseline was modernized with updated equipment. This new configuration was designated as TI-12 Hybrid (TI-12H). The TI-12H hardware also supports the Dual Band Radar (DBR) on CVN 78. The FY17 and beyond plans were adjusted to support the ACB-12 migration to the TI-12H configuration, to be completed in FY18, in addition to the migration to the TI-16 configuration, which will be completed in FY19. FY18-FY19 includes the system engineering analysis and hardware engineering for the next TI configurations, TI-16 Tech Refresh and TI-22, to define the architecture for the SSDS MK2 CS ship class variants, initial development of ACB 20, and the hardware requirements for common infrastructure for computing, display, network and cyber-security. FY19 includes initiation of the system engineering analysis for Joint Strike Fighter (JSF) F35B integration onboard LHA and LHD Class ships. FY19 will initiate the systems engineering and analysis for the integration of JSF F35B&C with Link 16.

For Cyber-Security, the Boundary Defense Capability (BDC) initiative under PU 2178, will provide SSDS MK2 and Combat Systems-level cyber-security protection based on system of systems risk assessment. Cyber Security BDC is a phased multi-year development to define, develop, and integrate enterprise Combat System cyber-security solutions. These solutions will provide a set of boundary defense capabilities for the SSDS MK2 ICS, a set of centralized Combat Systems-level cyber-security capabilities, and a set of element-level cyber-security protections. The boundary defense capabilities will protect and detect threats entering and leaving the Combat System. The centralized Combat System-level cyber-security capabilities will provide cyber situational awareness and management of various (e.g. malware detection, file integrity verification, etc.) cyber-security protection and detection capabilities. Element-level cyber-security protections will provide additional measures to ensure system integrity. Development of enterprise Combat System risk management processes will occur, to include a system of systems risk assessment methodology to support Combat System execution of the Risk Management Framework.

Combat System Integration under PU 2178 encompasses CS modeling and simulation, system analysis/engineering, and system/software development for integration of sensors, weapons and C4I systems with SSDS MK2 in CVN and Amphibious Class Ships for integrated air and missile defense, ship self-defense, multi-warfare combat direction and strike group interoperability. Combat System Integration includes Fire Control Loop Improvement Project (FCLIP), Far-Term Interoperability Improvement Project (FTIIP), and ACB-20 war-fighting improvements, including the integration of EASR/ERS.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

FCLIP is planned as a phased corrective action plan for system-of-systems deficiencies in SSDS MK2 ships, identified during live-fire testing with stressing anti-ship missile targets.

FCLIP Phase 2 is a phased multi-year development effort (FY16-FY19) that includes: CIWS integration with CEC/SSDS MK2, ESSM 2T Uplink, RAM Block2 Multi-Target processing in the missile, SoS integration of RAM Block 2 Multi-Target Processing, NSSMS MK9 Multi-Target Discrimination & Reporting, and modeling and analysis to ensure optimization and alignment of capabilities into the CS end-to-end fire control loop. CEC/SSDS MK2 Engage on Remote capability will be analyzed to determine performance improvements for potential implementation as part of FCLIP Phase 2. The overall scope of the multi-year development effort will include systems engineering/analysis, M&S, hardware and software development, cyber-security implementation, Factory Systems Integration Test (FSIT) with Wrap Around Simulation, and Wallops Island System integration and engineering testing for Fire Control Loop Elements.

FTIIP is the second phase of the corrective action plan for the resolution of the strike group interoperability issues. FTIIP includes implementation of Tactical Data Link (TDL) IFF Mode 5 identification capabilities, F/A-18 Digital Air Control (Phase 1) in support of F/A-18 and F-35 Joint Strike Fighter initial deployment, integration of the Shipboard Gridlock System/Automatic Correlation (SGS/AC) system into the SSDS MK2 TI-16 configuration, and implementation of other high priority software.

In FY09, system development was initiated for SSDS MK1 technology refresh for the LSD 41/49 class ships. The effort will transition these ships to an SSDS MK OACE and SSDS MK 2 single source library. The new system designation is SSDS MK2 Mod 5C. The system development effort encompasses TI of new OA computing and display equipment (Common Processor System (CPS) and Common Display System (CDS)), modifications and additions to the SSDS MK 2 software for an upgraded interface with the Phalanx Closed-In-Weapon System (CIWS) Block 1B Baseline 2 and Battle Force Tactical Trainer (BFTT), and other unique LSD SSDS interfaces and functionality. The first LSD SSDS MK 2 Mod 5C was installed in LSD-50 in FY14 after land-based Combat System Integration and Certification Testing with an IOC in FY16.

In FY10, SSDS MK 2 system development commenced for the first phase of migration to the Navy OA objective functional architecture designated as SSDS MK 2 ACB-12/TI-12. For the CVN78, the lead ship for ACB-12/TI-12, the baseline encompasses: implementation of common product line software components for System Track Management; integration of the product line System Track Management components and associated data model with other SSDS software components; integration of CPS and CDS; and expansion of SSDS MK 2 Local Area Network (LAN) to Combat System LAN; integration of new CS Combat System/C4I elements (Dual Band Radar(DBR), ESSM Block 1 with JUWL, SLQ-(V)6 SEWIP Block 2, MH-60R and CANES); implementation of cyber-security boundary defense capabilities and Total Ship Training Capability (TSTC). ACB-12/TI-12 has been fielded on the CVN 78, CVN 72 and LHD 2 in FY17. For the CVN 78, FY18-FY19 requires collaborative Combat System efforts to support DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group interoperability through extensive, Integrated Combat System (ICS) testing and software updates. For the CVN 78, FY19 will require collaborative Combat System efforts for support of Combat System Qualification Test (CSSQT) initiatives.

Funds were added in FY13 for the integration and test of SSDS MK2 Tactical Data Link (TDL) 16 interoperability improvements to address critical Strike Group interoperability issues under the AEGIS Wholeness Initiative, designated AMIIP. In FY13, software defect corrections were implemented as Phase 1 of the Fire Control Loop Improvement Project (FCLIP) to correct specific anti-ship missile defense deficiencies identified during live-fire testing. In FY16, FCLIP Phase 2 and FTIIP were initiated as follow on efforts for fire control loop and strike group interoperability improvements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

In PB15, SSDS MK 2 Advance Capability Build (ACB)-16 was delayed 2 years due to the need to prioritize critical SSDS system improvements. ACB-16 was the designation for the next major SSDS baseline for the integration of new sensor, weapon, and C4I capabilities for anti-ship missile defense and strike group interoperability. As a result of the delay, ACB-16 has been re-designated to ACB-20. The SSDS MK 2 ACB-12 capability baseline development, test, and fielding will continue as planned. However, with the delay in development and fielding of ACB-16, an increased number of SSDS MK2 ships will receive the ACB-12 capability baseline and specific fire control loop, interoperability and cyber-security improvements, in lieu of ACB-16.

Funds were requested in PB18 for integration of the Enterprise Radar Suite (EASR and X-Band TI), SSDS MK2/CS cyber-security enhancements, and integration of TSTC enhancements for ACB-20, ACB-20 SSDS MK 2 Combat System Integration development includes fire control loop improvements beyond FCLIP Phase 2 for tracking, weapon scheduling and engagement control with ESSM Block 2 missile; SEWIP Block 2 soft kill coordinator, SEWIP Block 3 Electronic Attack, and SEWIP Block 2/3 integration with SSDS MK2 TI-16 configuration.

SSDS MK2 Development Test and Evaluation (DT&E) provides for comprehensive testing of the integrated CS for the CVN 68, CVN 78, LPD 17, LHD1, LHA 6 and LSD41/49 ship classes. This includes Land-Based testing at Wallops Island and At-Sea testing for the lead ships for the new CS configurations, and Live Fire testing on the SDTS. The DT&E encompasses test planning, preparation, test conduct, data collection and analysis, and resolution and verification of deficiency corrections. The SSDS MK 2 T&E/Certification supports Integrated Combat System certification, the SSDS Test and Evaluation Master Plan (TEMP) and the Air Warfare Ship Self Defense CAPSTONE Enterprise TEMP.
The initial DT&E and Follow on Operational Test and Evaluation (FOT&E) for SSDS MK 2 was conducted with the CVN 76 SSDS MK 2 Mod 1 configuration in FY05. In FY07, the SSDS MK 2 FOT&E requirements were linked with the Air Warfare Ship Self Defense Enterprise T&E initiative to combine At-Sea Combat System element DT&E and OT&E requirements to synergize the resources required for testing in the SSDS MK 2 ships and the SDTS. The LPD-17 class SSDS MK 2 Mod 2 FOT&E was conducted in FY07/FY08 as part of the Enterprise T&E initiative. Live fire, Combat System end-to-end testing was conducted against Anti-Ship Cruise Missile (ASCM) targets on the SDTS in FY07/08/09 with the CVN/LHD/LPD configurations. FOT&E of ESSM integration with SSDS MK 2 was initiated on the CVN 68 class in FY08 and extended through FY16. FOT&E for the CVN class SSDS MK 2 Mod 1B OACE COTS TI was conducted in FY09. FY16/FY17 FOT&E includes the LHA 6 SSDS MK 2 Mod 4B configuration with the RAM Block 2 missile, ESSM, AMIIP and FCLIP. FY16-FY18 FOT&E includes the LSD SSDS MK 2 Mod 5C configuration with the Phalanx CIWS 1B Baseline 2 system and RAM Block2. FY16-FY19 DT/ FOT&E includes CVN 78 SSDS MK 2 Mod 6C configuration with the DBR, SEWIP Block 2 ES, ESSM Block 1 with JUWL up-link, and RAM Block 2.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SSDS MK2 Product Development/Combat Systems Integration	99.528	121.503	139.654	0.000	139.654
Articles:	-	-	-	-	-
FY 2018 Plans: For LSD SSDS MK 2 Mod 5C - Complete the development of software Build 10 for the TI-12H configuration. Conduct FSIT/FQT for this baseline.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
For CVN78 SSDS MK2 MOD 6C - For the CVN 78, FY 18-FY19 requires collaborative CS efforts to support CSSQT and DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group interoperability through extensive integrated testing and software updates. - Provide TAAF support for LBET at Wallops Island, shipboard post delivery test and trials, and implement software changes/correction for CST for CSSQT. For LHD6/CVN73 SSDS MK2 MOD 3C/1E ACB-12/TI-12H/TI-16 - Complete the ACB-12 software migration to TI-16 and TI-12H and conduct FSIT/FQT for these ship baselines - Provide support for integrated CS land-based integration and engineering test at WI. This includes test data analysis and system / software trouble report resolution. For FCLIP Phase 2 / FTIIP / TFCA BDC baselines - Continued the software development for CIWS integration with CEC/SSDS MK2, ESSM 2T Up-Link, and NSSMS MK9 Multi-Target Discrimination & Reporting. - Initiate engineering and certification testing of FCLIP Phase 2 improved fire control loop improvements. For SSDS MK2 ACB-20/EASR/ERS/TI-16 -Continue systems engineering / analysis to establish the Concept of Integration and initiate the definition and functional allocation of the Combat System requirements to support the full scale development of system and software changes to the Ship Self Defense System (SSDS) ICS for CVN 79/80 and L-Class ships ICS variants in order to integrate the SEWIP Block 2/Block 3 Softkill Coordinator, Airborne Off-board Electronic Warfare (AOEW), SEWIP Blk 3EA, ESSM BLK 2, Cyber-security improvements and interoperability standard enhancements, to close critical fire control loop and interoperability gaps. The overall scope of the multi-year development will include Systems Engineering/Analysis, M&S, Hardware and Software development, Cyber-Security Capabilities, Factory System Integration Test (FSIT) and Wrap Around Simulation, and Wallops Island System Integration Test for Fire Control Loop elements. - Conduct source selection for planned FY19 Q2 award of the competitive CSEA/SDA contract for the SSDS MK2 ICS development including the SSDS MK2 ACB-20 baseline development with the integration of EASR/ ERS/TI-16. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
For FCLIP Phase 2/FTIIP/TFCA BDC baselines - Complete Mode 5 IFF development for Baseline 9. - Complete the software development for CIWS integration with CEC/SSDS MK2, ESSM 2T Up-Link, and NSSMS MK9 Multi-Target Discrimination and Reporting. - Continue engineering and certification testing of FCLIP Phase 2 improved fire control loop improvements. - Complete software development for IFF Mode 5 integration with SSDS MK2 Builds 9, 10 & 11. - Initiate Test, Analyze and Fix period for FCLIP Ph 2 and FTIIP capabilities. - Continue designing and developing TFCA Cyber-Security improvements to secure the combat system enclave. For Build 10 (ACB-12/TI-12 and ACB-12/TI-12H) - Provide TAAF and complete certifications to support ship installations and deployments. For Build 11 (ACB-12/TI-16) - Complete testing and certification (integration and combat system level), providing required TAAF, to support ship installations and deployments. For SSDS MK2 ACB-20/EASR/ERS/TI-16 - Award new CSEA/SDA contract for the SSDS MK2 ICS development - Transition from government engineering to design and development. For Joint Strike Fighter F35B - Initiate systems engineering analysis for LHA and LHD Class ships - Initiate systems engineering analysis for the integration of JSF F35BG&C with Link 16. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $18.151M increase from FY 2018 to FY 2019 is due to CVN78 Wholeness SSDS/Combat System Integration (OSD IRT).					
Title: SSDS MK2 Development Test & Evaluation	26.940	27.479	30.014	0.000	30.014
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
For LSD SSDS MK 2 Mod 5C - Complete CSSQT on LSD49 - Conduct DTIII Phase 1 at ICSTF - Conduct OTIII Phase 2 ET12 SDTS - Conduct OTIII Phase 3 ET14 Lead Ship Event For CVN78 SSDS MK2 Mod6C - Continue Land-Based integration and engineering testing at WI and aboard ship for ICS software changes/ corrections for CVN78 DT/OT/ OPEVAL and deployment software deliveries. For the CVN 78, FY 17-FY19 requires collaborative Combat System efforts to support CSSQT and DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group interoperability through extensive, Integrated Combat System (ICS) testing and software updates. - Conduct Fire Control Loop risk reduction TRKEX/MSLEX on SDTS with DBR (MFR), CEC, SSDS MK2, SEWIP Block 2, ESSM and RAM Block2. - Initiate DT/OT-III J Phase 3/ET-09 MSLEX on SDTS. - Conduct CST at WI for authorization OQE for ICS software package for CSSQT Phase 2. For LHD6/CVN73 SSDS MK2 MOD 3C/1E ACB-12/TI-12H/TI-16 - Conduct CST at WI for authorization OQE for ICS software package for LHD6 SSDS Mod 3C ACB-12/TI-12H for CSLO. For FCLIP Phase 2/FTIIP/TFCA BDC - Initiate land-based integration and engineering testing at WI.					
FY 2019 Base Plans: For LSD SSDS MK2 Mod 5C - OTIII Phase 2 ET12 SDTS For CVN 78 SSDS MK2 Mod 6C - Conduct CST at WI for authorization OQE for ICS software package for CSSQT Phase 2. - Conduct CSSQT for CVN 78. - Complete DT/OT-III J Phase 3/ET-09 MSLEX on SDTS - Commence DTIII-J-Phase 3 on CVN 78					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
For FCLIP Phase 2/FTIIP/TFCA BDC - Initiate Sea-Based DT on SDTS - Conduct CST at WI for authorization OQE for ICS software package for Baseline 9. For LHD6/CVN73 SSDS MK2 Mod 3C/1E ACB-12/TI-12H/TI-16 - Conduct CST at WI for authorization OQE for ICS software package for LHD6 SSDS Mod 3C ACB-12/TI-12H for CSLO. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $2.535M increase from FY 2018 to FY 2019 is due to CVN78 Wholeness SSDS/Combat System Integration (OSD IRT).					
Accomplishments/Planned Programs Subtotals	126.468	148.982	169.668	0.000	169.668

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/ BLI 5231 (SSDS): *SSDS*	54.919	73.086	90.336	-	90.336	91.336	97.030	93.470	98.257	Continuing	Continuing
• RDTEN/0607658N: *Cooperative Engagement Capability*	75.099	92.571	130.515	-	130.515	141.373	147.710	125.458	121.220	Continuing	Continuing

Remarks

D. Acquisition Strategy

D. Acquisition Strategy

The first SSDS MK 2 system procurements took place under a Cost Plus Award Fee (CPAF) contract in FY99 for the CVN 76, LPD 17, LPD 18 and CVN 69. Follow-on equipment procurements for additional ships of the CVN, LPD and LHD classes were awarded on Firm Fixed Price (FFP) contracts. For those ships that will be receive P3I OACE COTS tech Refresh hardware suites, the initial system Tech Refresh Development occurred under a CPAF type contract, with ship COTS conversion equipment/kits procured on FFP contracts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

A system engineering/design agent and Life Cycle Maintenance Cost Plus Fixed Fee (CPFF) contract was awarded in FY05 and a follow-on CPFF/CPAF contract, N00024-08-C-5122, was awarded on 30 Sept 2008, to support SSDS MK 2 system/software maintenance and system upgrades through FY13 including the TI-12 COTS Tech Insertion.

A sole source follow-on Cost Plus Incentive Fee (CPIF) Level of Effort (LOE) contract, N00024-14-C-5128, was awarded 18 December 2013 with a Period of Performance (PoP) from FY14-FY17 for the development, test, certification of SSDS MK2 (ACB 12/TI-12) for CVN78, CVN72, LHD2, and the software migration of ACB 12 to TI-12H/TI-16 for CVN 68, LHD 1, LPD 17 ship classes. This contract was extended to December 2018 and an additional extension through FY20 is planned to provide continued support of the SSDS MK 2 to execute and complete development of the existing contract scope requirements for CVN and Amphibious Modernization ACB 12 on TI-12 and TI-12 Hybrid (TI-12H) (SSDS Software Build 10), and TI-16 (SSDS Software Build 11).

For SSDS MK2 TI-12H/TI-16 equipment, the SSDS program will use competitive build to specification production contracts, and leverage common enterprise COTS Open Architecture Computing Environment (OACE) products for computing, storage, display, network, conversion, and cyber security.

A new competitive contract for a SSDS Combat System Engineering Agent (CSEA)/Software Design Agent (SDA) is planned to be awarded in FY19 with a ten (10)-year PoP from FY19-FY29. This contract will provide support for the CVN and Amphibious Ship Class SSDS Combat System (CS) element and any future surface combatant based on evolution of the SSDS MK 2 Combat Systems Post-Advanced Capability Build (ACB) 12/TI-12/TI-12H/TI-16/TI-16 Tech Refresh and for ACB 20 and follow-on SW and HW technology upgrades. The current anticipated requirements to be provided include systems and software engineering support, development of engineering products to support combat system integration, configuration control, developmental test/operational test (DT/OT) support, training and logistics support, and field technical support for the SSDS ICS.

A CPAF/CPIF delivery order, N00178-04-D-4112-EH04, was awarded in FY05 to acquire a Systems Engineering & Integration (SE&I) agent to support SSDS MK2 (ACB 12) development, integration and testing for the CVN 78 Class Warfare System. A five (5)-year competitive CPIF contract with a PoP from FY17-FY22, was awarded on 02 March 2017 to provide ICS Systems Engineering, Integration and Test (SEI&T) support for the development, and/or alignment of existing and future emerging technical plans and engineering products across ship classes to provide support and resources for the integration, installation, checkout, and performance acceptance of the SSDS ICS on large deck class ships.

E. Performance Metrics

Requirement Documents
- Capability Development Document (CDD) for Ship Self Defense System (SSDS) MK2 approved 19 December 2013.
- Test and Evaluation Master Plan (TEMP No. 1400) For Ship Self Defense System (SSDS) Revision B, 5 Mar 2008. Revision C is in routing for approval and is anticipated to be signed out in FY18. During the approval cycle, DOT&E requested a major update to Rev. C to include cyber security T&E requirements.

Background
- SSDS MK1 OPEVAL was successfully completed June 1997 with a Milestone III approval in March 1998
- SSDS MK2 MOD 1 FOT&E was conducted on CVN 76 in 2005. All KPP thresholds were met. However, the system was assessed as not suitable and not effective by COMOPTEVFOR based on the identification of SSDS MK2 and Combat Systems deficiencies (24major, 37 minor deficiencies).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

- SSDS MK 2 Mod 2 FOT&E was conducted in LPD 17-19 in 2007/2008. All KPPs thresholds were met and the system was assessed OPERATIONALLY EFFECTIVE and OPERATIONALLY SUITABLE by COMOPTEVFOR in the 12 Feb 2010 report. 10 major and minor deficiencies were identified against SSDS MK 2. (Also, major Warfare effects deficiencies were identified against the LPD 17 class Combat System).
- SSDS MK 2 Mod 3A FOT&E was conducted in LHD 8 in Feb 2010. All KPPs thresholds were met and the system was assessed OPERATIONALLY EFFECTIVE and OPERATIONALLY SUITABLE by COMOPTEVFOR in the 13 Dec 2010 report. 10 major deficiencies were identified against SSDS MK 2. (Also, major Warfare effects deficiencies were identified against the LHD 8 Combat System).
- SSDS MK2 FOT&E with ESSM and RAM Block 1 was conducted in the SDTS Oct-Dec 2011 as part of Enterprise Test - 03. Combat System (system-of-system) deficiencies identified during MSLEX with stressing targets has resulted in a phased corrective action plan, designated as Fire Control Loop Improvement Project (FCLIP).
- SSDS MK2 FOT&E with RAM Block 2 DT&E was conducted in the SDTS Dec 2014 as part of Enterprise Test - O5 Phase 2. Low altitude, supersonic, maneuvering targets were successfully engaged with RAM Block 2 missiles.
- Conducted Enterprise Test (ET) Event 5 and Event 6 against a wide array of subsonic and supersonic targets during live fire testing conducted against the Self Defense Test Ship (SDTS) and the USS America (LHA 6) to assess performance of the Integrated Combat System (ICS).
- April 2016, at the Navy's test facility at Point Mugu, CA, the SDTS LHA6-configured SSDS MK 2 integrated CS utilizing the Rolling Airframe Missile (RAM) Guided Missile Weapons System (comprised of the MK 49 Launcher and the Block 2 missile) successfully completed a live fire test by engaging and killing a pair of supersonic, maneuvering, sea-skimming targets designed to represent current anti-ship missile threats. The test event validated that significant progress has been made FCLIP program which was designed to improve coordination across all elements of the overall SSDS integrated CS. This test was the second successful integrated combat systems firing event against this surrogate threat accomplished by the shipboard air search radars and surface to air missiles found on U.S. Navy Amphibious Class ships. The integrated CS is comprised of the SSDS Mk 2 Mod 4B, SPS-48, SPS-49, SPQ-9B, SLQ-32, Evolved Sea Sparrow Missile and RAM Block 2 missile.

Status

- The Director, Operational Test and Evaluation (DOT&E) Annual Reports have identified ship self-defense mission deficiencies based on operational testing. The report is a compilation of multiple reports from Commander,

Operational Test Force (COTF) including shipboard testing on the CVN 76, CVN 70, LPD 17, LPD 18, LPD 19, LHD 8; and enterprise testing on the SDTS and in the Probability of Raid Annihilation (PRA) test-bed.

- SSDS was assessed Operationally Effective and Operationally Suitable for the LPD 17 Class and LHD 8. The Combat Systems (CVN, LPD, LHD) were assessed Not Operationally Effective against several Anti-Ship Cruise Missiles (ASCM). There are system of systems performance issues and design limitations. The issues are divided into four categories: detect, engage, test resources, and threat representation.
- All of the major training deficiencies have been addressed and are pending Verification of Correction of Deficiency (VCD) by COTF. Revised SSDS NTSP was signed 30 Jul 2012.
- OPNAV N96 is working with PEO IWS, DASN, and COTF to address the shortfalls in performance testing with the following initiatives:

a. Develop, test and field combat system improvements through the Fire Control Loop Improvement Project (FCLIP) Phase 1 with SSDS MK2 integration of: High Diver improvements to SPS-48E and CEC; SPQ-9B tracking improvements; North Atlantic Treaty Organization (NATO) Seasparrow Surface Missile System (NSSMS) MK 9 Target Illuminator improvements.

b. Integrate, test, and field SEWIP Block 2, and NULKA improvements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

c. Expand the use of Modeling and Simulation.
d. Develop FCLIP Phase 2 capabilities for RAM Block 2 Multi-Target processing, NSSMS MK9 TI Multi-Target discrimination and reporting, ESSM 2T Up-link and CIWS integration with CEC / SSDS MK2.
e. Consider follow on high return self-defense improvements with FCLIP and Advanced Capability Builds (ACB).
- Additional T&E and certification initiatives include:
a. Conduct element and platform level cyber-security testing using land based test site (LBTS) facilities.
b. Move away from platform centric certification testing towards baseline configuration centric testing for combat systems certification testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - ACB12/TI12 / LSD - PSEA / SW Dev't	SS/CPIF	RSC IDS (5128) : San Diego, CA	96.740	25.068	Dec 2016	8.006	Dec 2017	20.340	Dec 2018	-		20.340	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD / AMIIP - PSEA / SW Dev't	SS/CPAF	RSC IDS (5122) : San Diego, CA	38.416	0.000		0.000		0.000		-		0.000	0.000	38.416	-
PD - ACB12/TI12 / LSD - SE	SS/CPFF	JHU/APL : Laurel, MD	71.032	2.112	Dec 2016	1.250	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD - SW Dev/PL-STM	SS/CPAF	Gen. Dyn. (5100) : Fairfax, VA	3.628	0.000		0.000		0.000		-		0.000	0.000	3.628	-
PD - ACB12/TI12 / LSD - SE	WR	NSWC DD : Dalhgren, VA	75.750	6.169	Nov 2016	1.150	Dec 2017	1.993	Dec 2018	-		1.993	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD - SE / ILS	WR	CDSA DN : Dam Neck, VA	22.927	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD - SE&I/Force Pt	C/CPIF	RSC (IIS) : Suffolk, VA	0.976	0.000		0.000		0.000		-		0.000	0.000	0.976	-
PD - ACB12/TI12 / LSD - LBET/TrainingI	WR	NSWC PHD : Pt Hueneme, CA	30.023	1.751	Nov 2016	0.975	Dec 2017	1.792	Nov 2018	-		1.792	Continuing	Continuing	Continuing
PD - ACB12/TI12 / LSD - CVN78 LBET/Metrics/On-site Support	WR	NSWC Corona : Corona, CA	0.412	0.736	Nov 2016	0.125	Nov 2017	0.200	Nov 2018	-		0.200	0.000	1.473	-
PD - ACB12/TI12 / LSD -Navy Link Cert/Cross-Domain Sprt	WR	SPAWAR : San Diego, CA	0.225	0.210	Nov 2016	0.000		0.000		-		0.000	0.000	0.435	-
PD - ACB12/TI12 / LSD - Moriah Integration	WR	NAVAIR : Lakehurst, NJ	0.309	0.000		0.000		0.000		-		0.000	0.000	0.309	-
PD - ACB12/ CVN78 LBET w/DBR/RES	SS/CPIF	RSC IDS : Sudbury, MA	0.000	5.080	Jan 2017	0.000		0.000		-		0.000	0.000	5.080	-
PD - ACB12/ CVN78 LBET w/CEC	SS/CPIF	RSC IDS : St. Petersburg, FL	0.000	1.275	Jan 2017	0.000		0.000		-		0.000	0.000	1.275	-
PD - ACB12/ CVN78 LBET w/TPX-42	WR	NAVAIR : St. Inigoes, MD	0.000	0.111	Mar 2017	0.000		0.000		-		0.000	0.000	0.111	-
PD - ACB12/TI-16/TI12H - HW Dev / ILS / EDM Proc (DN)	WR	CDSA DN : Dam Neck, VA	11.451	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - ACB12/TI-16/TI12H - HW Engr	WR	NSWC DD : Dalhgren, VA	2.418	7.765	Nov 2016	2.480	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI-16/TI12H - SW Migration PSEA	SS/CPIF	RSC IDS (5128) : San Diego, CA	11.799	11.572	Dec 2016	27.566	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI-16/TI12H - SE	SS/CPFF	JHU/APL : Laurel, MD	0.461	1.025	Dec 2016	2.000	Dec 2017	0.000		-		0.000	0.000	3.486	-
PD - ACB12/TI-16/TI12H - LBET/Training Course Development	WR	NSWC-PHD : Pt Hueneme, CA	0.000	0.575	Nov 2016	2.000	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - ACB12/TI-16/TI12H - Metrics/On-Site Sprt	WR	NSWC Corona : Corona, CA	0.251	0.418	Nov 2016	0.418	Nov 2017	0.000		-		0.000	0.000	1.087	-
PD - ACB12/TI-16/TI12H - CPS Engnr	C/IDIQ	GTS : Virginia Beach, VA	0.042	0.000		0.000		0.000		-		0.000	0.000	0.042	-
PD - ACB12/TI-16/TI12H - Navy Link Cert/Cross-Domain Sprt	WR	SPAWAR : San Diego, CA	0.000	0.000		0.326	Nov 2017	0.000		-		0.000	0.000	0.326	-
PD - Cyber Resiliency / BDC PSEA SW DEV'T	SS/CPIF	RSC IDS (5128) : San Diego, CA	1.785	4.346	Dec 2016	5.223	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	SS/CPFF	JHU/APL : Laurel, MD	0.462	0.775	Dec 2016	0.791	Dec 2017	1.000	Dec 2018	-		1.000	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	NSWC-DD : Dalhgren, VA	0.708	2.016	Nov 2016	1.610	Nov 2017	0.931	Nov 2018	-		0.931	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	CDSA DN : Dam Neck, VA	0.864	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	C/CPIF	Progeny Systems Corp : Manasas, Va	0.181	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	G2OPS : Washington DC	0.000	0.207	Apr 2017	0.211	Nov 2017	0.500	Nov 2018	-		0.500	0.000	0.918	-
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	NSWC PHD : Port Hueneme, CA	0.000	0.657	Nov 2016	0.670	Nov 2017	0.650	Nov 2018	-		0.650	0.000	1.977	-
PD - Cyber Resiliency / BDC PSEA SW DEV'T	WR	NSWCPD : Philadelphia, PA	0.000	0.000		0.000		0.100	Nov 2018	-		0.100	0.000	0.100	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PD - Cyber Resiliency / BDC PSEA SW DEV'T	C/CPIF	Gryphon/DELTA : Washington DC	0.000	0.000		0.000		0.829	Dec 2018	-		0.829	0.000	0.829	-
PD - Cyber Resiliency / BDC PSEA SW DEV'T	C/CPAF	CSEA Contract : TBD	0.000	0.000		0.000		3.990	Dec 2018	-		3.990	0.000	3.990	-
PD - TI-16TR/TI22 - HW Engineering	WR	CDSA DN : Dam Neck, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
PD - TI-16TR/TI22 -HW Engineering	WR	NSWC-DD : Dalhgren, VA	0.000	0.100	Nov 2016	0.920	Nov 2017	5.383	Nov 2018	-		5.383	0.000	6.403	-
PD - HQ Travel	Various	PEO IWS : Washington DC	0.250	0.120	Dec 2016	0.150	Nov 2017	0.150	Nov 2018	-		0.150	Continuing	Continuing	Continuing
PD - SE/Dev/Integrate	SS/CPAF	Rayth(5412) (RIDS) : Portsmouth, RI	83.451	0.000		0.000		0.000		-		0.000	0.000	83.451	-
PD - F35B Integration / LHA / LHD	C/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		8.462	Dec 2018	-		8.462	0.000	8.462	-
PD - F35B Integration / LHA / LHD	WR	NSWC DD : Dalhgren, VA	0.000	0.000		0.000		7.692	Nov 2018	-		7.692	0.000	7.692	-
PD - F35B Integration / LHA / LHD	C/CPIF	SEI&T : Washington DC	0.000	0.000		0.000		3.846	Dec 2018	-		3.846	0.000	3.846	-
PD - F35B/C - ICS Link 16 Integration	C/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		1.100	Dec 2018	-		1.100	0.000	1.100	-
PD - F35B/C - ICS Link 16 Integration	WR	NSWC DD : Dalhgren, VA	0.000	0.000		0.000		1.000	Nov 2018	-		1.000	0.000	1.000	-
PD - F35B/C - ICS Link 16 Integration	C/CPIF	SEI&T : Washington DC	0.000	0.000		0.000		0.500	Dec 2018	-		0.500	0.000	0.500	-
PD - Misc - Prior Year Cum Cost	C/BA	Misc : Washington DC	278.994	0.000		0.000		0.000		-		0.000	0.000	278.994	-
PD - PM Prod Development	C/CPIF	various : various	30.983	2.603	Dec 2016	2.943	Dec 2017	3.000	Dec 2018	-		3.000	0.000	39.529	-
CSI - ACB20 (Less EASR) - SE	WR	NSWC COR : Corona, CA	0.000	0.000		0.000		0.450	Nov 2018	-		0.450	0.000	0.450	-
CSI - ACB20 (Less EASR) - SE	WR	NSWC DD : Dalhgren, VA	0.000	0.000		5.520	Nov 2017	6.399	Nov 2018	-		6.399	0.000	11.919	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - ACB20 (Less EASR) - SE	WR	NSWC PHD : Port Huneme, CA	0.000	0.000		0.323	Nov 2017	1.250	Nov 2018	-		1.250	0.000	1.573	-
CSI - ACB20 (Less EASR) - SE	WR	NUWC KP : Keyport, WA	0.000	0.000		0.161	Nov 2017	0.175	Nov 2018	-		0.175	0.000	0.336	-
CSI - ACB20 (Less EASR) - SE	SS/CPAF	Rayth (RIDS) : Portsmouth, RI	0.000	0.000		1.075	Dec 2017	0.000		-		0.000	0.000	1.075	-
CSI - ACB20 (Less EASR) - SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.000	0.000		4.375	Dec 2017	2.233	Dec 2018	-		2.233	0.000	6.608	-
CSI - ACB20 (Less EASR) - SE	SS/CPFF	JHU/APL : Laurel, MD	0.000	0.000		5.458	Dec 2017	5.906	Dec 2018	-		5.906	0.000	11.364	-
CSI - ACB20 (Less EASR) - SE	C/CPAF	CSEA Contract : TBD	0.000	0.000		0.000		11.935	Dec 2018	-		11.935	0.000	11.935	-
CSI - FCLIP Phase 2 - PSEA	SS/CPIF	RSC IDS (5128) : San Diego, CA	7.167	5.030	Dec 2016	7.527	Dec 2017	5.370	Dec 2018	-		5.370	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	SS/CPFF	JHU/APL : Laurel, MD	7.110	2.350	Dec 2016	2.258	Dec 2017	1.598	Nov 2018	-		1.598	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	WR	NSWC-DD : Dahlgren, VA	1.418	0.279	Nov 2016	0.724	Nov 2017	1.016	Nov 2018	-		1.016	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	WR	CDSA DN : Dam Neck, VA	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
CSI - FCLIP Phase 2 - SE	WR	NSWC PHD : Pt Hueneme, CA	0.406	0.000		0.452	Nov 2017	1.308	Nov 2018	-		1.308	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE / Planning	C/CPIF	Delta Resources : Alexandria, VA	0.339	0.000		0.000		0.000		-		0.000	0.000	0.339	-
CSI - FCLIP Phase 2 - SE & I	C/CPIF	RSC IIS (4112) : Suffolk, VA	2.136	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.000	0.527	Dec 2016	1.151	Dec 2017	2.019	Dec 2018	-		2.019	0.000	3.697	-
CSI - FCLIP Phase 2 - SE Multi-Link Antenna	TBD	IWS 5 : TBD	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
CSI - FCLIP Phase 2 - SE RAM/ESSM	WR	NAWC : China Lake	1.340	0.557	Nov 2016	0.591	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - FCLIP Phase 2 - SE RAM/CIWS	SS/CPFF	RSC(5432/5410) : Tuscon, AZ	1.080	0.000		1.882	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	WR	NSWC : Crane, IN	0.250	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FCLIP Phase 2 - SE	WR	NSWC COR : Corona, CA	0.000	0.000		0.000		0.252	Nov 2018	-		0.252	0.000	0.252	-
CSI - FCLIP Phase 2 - SE / SW Dev't	SS/CPAF	Rayth (RIDS) : Portsmouth, RI	2.792	4.760	Dec 2016	2.903	Dec 2017	0.000		-		0.000	0.000	10.455	-
CSI - FCLIP Phase 2 - SE	WR	NUWC KP : Keyport, WA	0.200	0.000		0.269	Nov 2017	0.000		-		0.000	0.000	0.469	-
CSI - FTIIP - PSEA - SW Dev't	SS/CPIF	RSC IDS (5128) : San Diego, CA	1.413	1.631	Dec 2016	7.429	Dec 2017	6.461	Dec 2018	-		6.461	Continuing	Continuing	Continuing
CSI - FTIIP - SE	C/BA	JHU/APL : Laurel, MD	0.151	0.000		0.300	Nov 2017	0.580	Nov 2018	-		0.580	0.000	1.031	-
CSI - FTIIP - SE	WR	NSWC-DD : Dahlgren, VA	0.425	0.652	Nov 2016	3.602	Nov 2017	1.489	Nov 2018	-		1.489	Continuing	Continuing	Continuing
CSI - FTIIP - SE	WR	CDSA DN : Dam Neck, VA	0.616	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FTIIP - SE&I	C/CPIF	RSC IIS (4112) : Suffolk, VA	0.495	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - FTIIP - SE	WR	NSWC PHD : Port Hueneme, CA	0.000	0.000		0.215	Nov 2017	0.000		-		0.000	0.000	0.215	-
CSI - FTIIP - SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.000	0.731	Nov 2016	1.034	Dec 2017	1.830	Dec 2018	-		1.830	0.000	3.595	-
CSI - FTIIP - SE	WR	NUWC KP : Keyport, WA	0.000	0.186	Nov 2016	0.000		0.200	Nov 2018	-		0.200	0.000	0.386	-
CSI - ICS SE - PSEA SE	SS/CPIF	RSC IDS (5128) : San Diego, CA	0.808	0.331	Dec 2016	0.215	Dec 2017	0.000		-		0.000	0.000	1.354	-
CSI - ICS SE - SE&I	C/CPIF	RSC (IIS) : Suffolk, VA	2.404	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - ICS SE - SEA 05C	C/BA	SEA 05C : Washington DC	0.237	0.165	Dec 2016	0.215	Nov 2017	0.000		-		0.000	0.000	0.617	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CSI - ICS SE - SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.000	1.427	Dec 2016	1.622	Nov 2017	2.817	Nov 2018	-		2.817	0.000	5.866	-
CSI - ICS SE	SS/CPFF	JHU/APL : Laurel, MD	2.455	1.819	Dec 2016	1.450	Dec 2017	1.448	Dec 2018	-		1.448	Continuing	Continuing	Continuing
CSI - ICS SE	WR	NSWC DD : Dalhgren, VA	3.068	0.839	Nov 2016	1.669	Nov 2017	1.635	Nov 2018	-		1.635	Continuing	Continuing	Continuing
CSI - ICS SE	WR	CDSA DN : Dam Neck, VA	0.515	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CSI - ICS SE	WR	NUWC KP : Keyport, WA	0.300	0.103	Nov 2016	0.269	Nov 2017	0.225	Nov 2018	-		0.225	0.000	0.897	-
CSI - ICS SE	C/CPIF	Delta Resources : Virginia Beach, VA	0.205	0.000		0.000		0.000		-		0.000	0.000	0.205	-
CSI - ICS SE	FFRDC	MITRE : McClean, VA	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
CSI - ICS SE	C/CPAF	CSEA Contract : TBD	0.000	0.000		0.000		0.500	Dec 2018	-		0.500	0.000	0.500	-
CSI - EASR / ESS SE	SS/CPFF	JHU/APL : Laurel, MD	1.067	0.750	Dec 2016	3.575	Dec 2017	1.648	Dec 2018	-		1.648	Continuing	Continuing	Continuing
CSI - EASR / ESS SE	WR	NSWC DD : Dalhgren, VA	0.274	1.444	Nov 2016	2.970	Nov 2017	4.371	Nov 2018	-		4.371	Continuing	Continuing	Continuing
CSI - EASR / ESS / SEI&T	C/CPIF	Gryphon/Delta : Washington DC	0.640	1.256	Dec 2016	2.344	Nov 2017	3.296	Nov 2018	-		3.296	0.000	7.536	-
CSI - EASR / ESS SE	WR	CDSA DN : Dam Neck, VA	0.273	0.000		0.000		0.000		-		0.000	0.000	0.273	-
CSI - EASR / ESS SE	C/CPAF	RSC (5202) : St. Pete, FL	0.246	0.000		0.788	Nov 2017	0.000		-		0.000	0.000	1.034	-
CSI - EASR / ERS SE	WR	NSWC PHD : Port Huneme, CA	0.000	0.000		0.323	Nov 2017	0.685	Nov 2018	-		0.685	0.000	1.008	-
CSI - EASR / ERS SE	C/CPAF	CSEA Contract : TBD	0.000	0.000		0.000		9.100	Dec 2018	-		9.100	0.000	9.100	-
		Subtotal	805.043	99.528		121.503		139.654		-		139.654	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

- For the CVN 78, FY18-FY19 includes major, collaborative CS efforts to support DT/OT/OPEVAL and achieve requisite deployment capabilities for Ship Self Defense and Strike Group Interoperability though extensive integrated testing and software updates.
- In FY17-FY19, new contracts have been/will be awarded on a competitive basis in support of SSDS for Systems Engineering Integration & Test (SEI&T)(awarded to Gryphon Technologies, Inc. in FY17) and a Combat system Engineering Agent/Software Design Agent (CSEA/SDA) contract (planned for award in early FY19).

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT&E (PHD)	WR	NSWC PHD : Port Hueneme, CA	98.329	6.671	Nov 2016	5.286	Nov 2017	6.690	Nov 2018	-		6.690	Continuing	Continuing	Continuing
DT&E (SCSC-WI)	WR	SCSC-WI : Wallops Is, VA	68.310	5.200	Nov 2016	6.954	Nov 2017	8.112	Nov 2018	-		8.112	Continuing	Continuing	Continuing
DT&E (JHU/APL)	SS/CPFF	JHU/APL : Laurel, MD	22.122	3.165	Dec 2016	2.929	Dec 2017	3.356	Dec 2018	-		3.356	Continuing	Continuing	Continuing
DT&E (Corona)	WR	NSWC Corona : Corona, CA	11.618	2.870	Nov 2016	2.959	Nov 2017	2.603	Nov 2018	-		2.603	Continuing	Continuing	Continuing
DT&E (RAM/CIWS// ESSM) (RSC)	SS/CPFF	RSC(5432/5410) : Tucson, AZ	3.688	0.412	Nov 2016	0.424	Nov 2017	0.404	Nov 2018	-		0.404	Continuing	Continuing	Continuing
DT&E/CST (DD - CST)	WR	NSWC DD : Dahlgren, VA	20.104	6.211	Nov 2016	6.404	Nov 2017	6.014	Nov 2018	-		6.014	Continuing	Continuing	Continuing
DT&E (COTF)	WR	OPTEVFOR : Norfolk, VA	4.640	1.194	Nov 2016	1.231	Nov 2017	1.243	Nov 2018	-		1.243	Continuing	Continuing	Continuing
DT&E (CDSA-DN)	WR	CDSA DN : Dam Neck, VA	4.656	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DT&E (engility)	C/CPIF	Engility : Virginia Beach, VA	1.820	1.217	Dec 2016	1.292	Dec 2017	1.592	Dec 2018	-		1.592	0.000	5.921	-
DT&E (SPAWAR-SD)	WR	SPAWAR : San Diego, CA	5.780	0.000		0.000		0.000		-		0.000	0.000	5.780	-
DT&E (Raytheon - St. Pete)	SS/CPAF	RSC (5202) : St. Pete, FL	4.708	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 2178 / *QRCC*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT&E (RAM/ESSM) (China Lake)	WR	NAWC : China Lake, CA	1.150	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
DT&E (Raytheon - SE&I)	C/CPIF	Rayth - IIS : Sofolk, Va.	0.571	0.000		0.000		0.000		-		0.000	0.000	0.571	-
DT&E Raytheon - PSEA	SS/CPIF	RSC (5128) : San Diego, CA	0.182	0.000		0.000		0.000		-		0.000	0.000	0.182	-
DT&E (GD/AIS - IWS 1.0)	SS/CPAF	GD/AIS : Fairfax Va.	0.266	0.000		0.000		0.000		-		0.000	0.000	0.266	-
DT&E (Raytheon - RIDS)	SS/CPAF	RSC (5412) : Portsmouth, RI	1.902	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	249.846	26.940		27.479		30.014		-		30.014	Continuing	Continuing	N/A

Remarks

- Accomplishment of SSDS MK2 CS integration and certification testing for ship system installation and deployment;
- Accomplishment of the CVN78 CSSQT and SSDS MK2 ACB-12/TI-12 integrated CS test and evaluation (At-Sea aboard CVN78 and aboard the Self Defense Test Ship (SDTS).

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,054.889	126.468		148.982		169.668		-		169.668	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

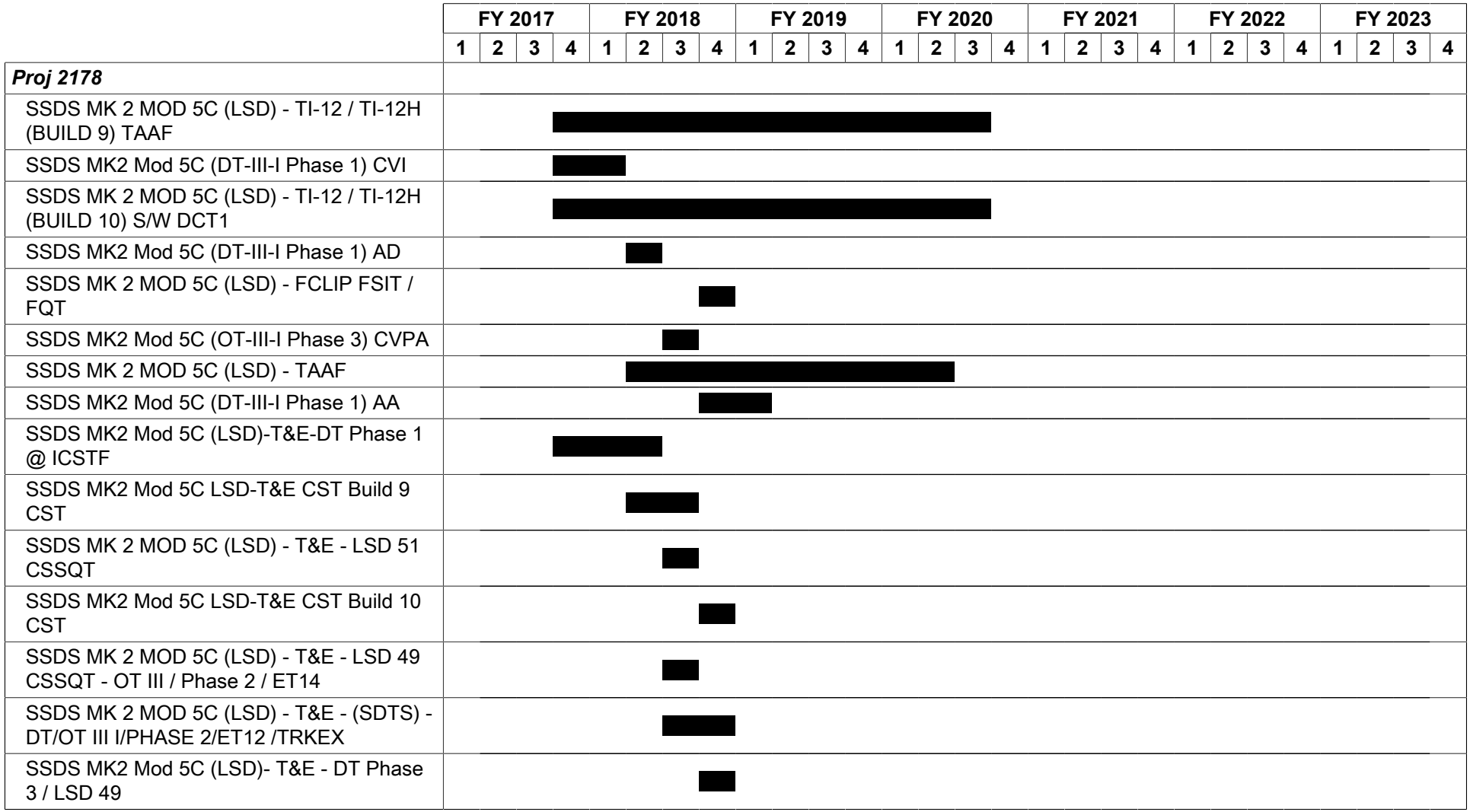


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

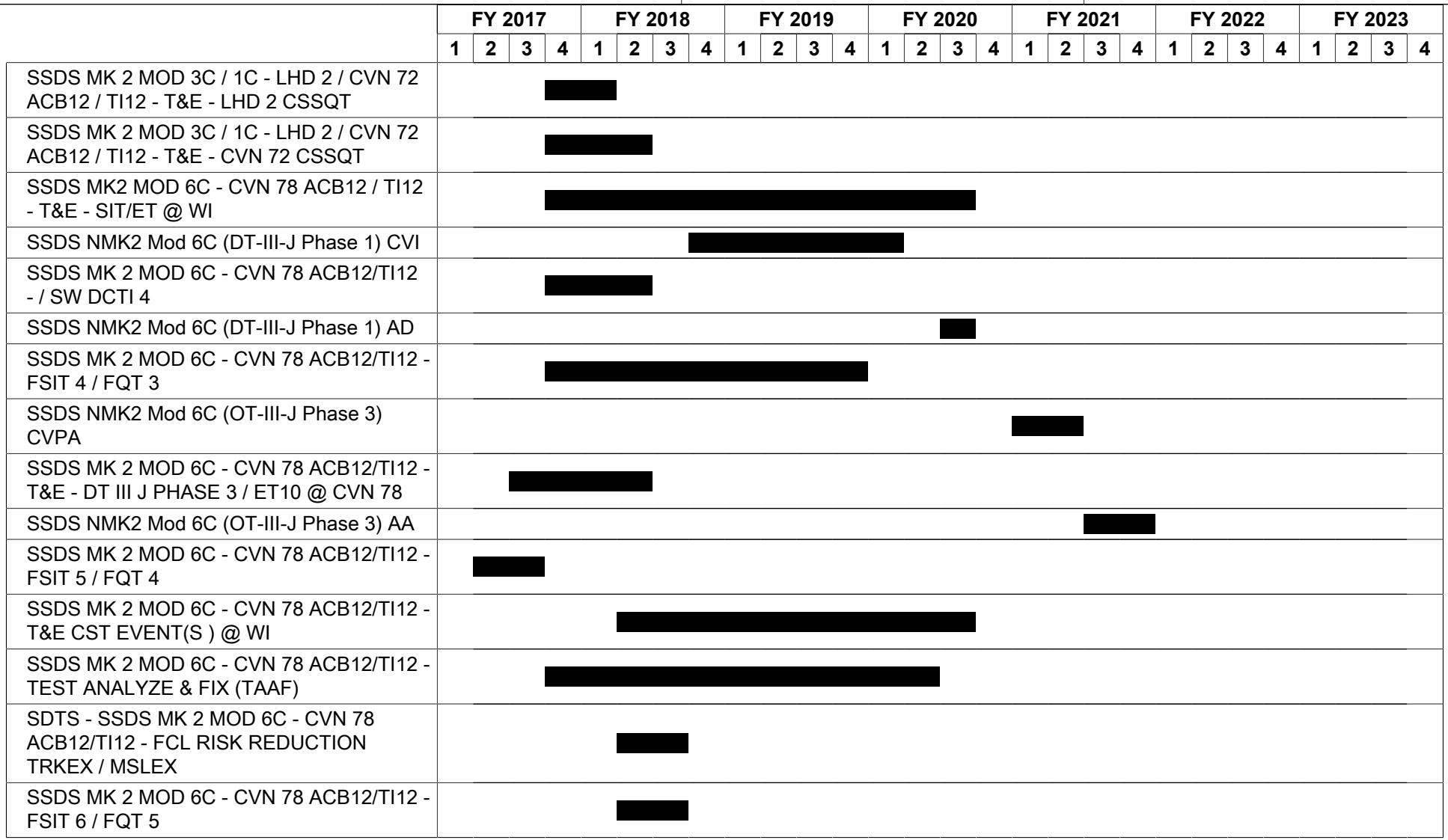


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

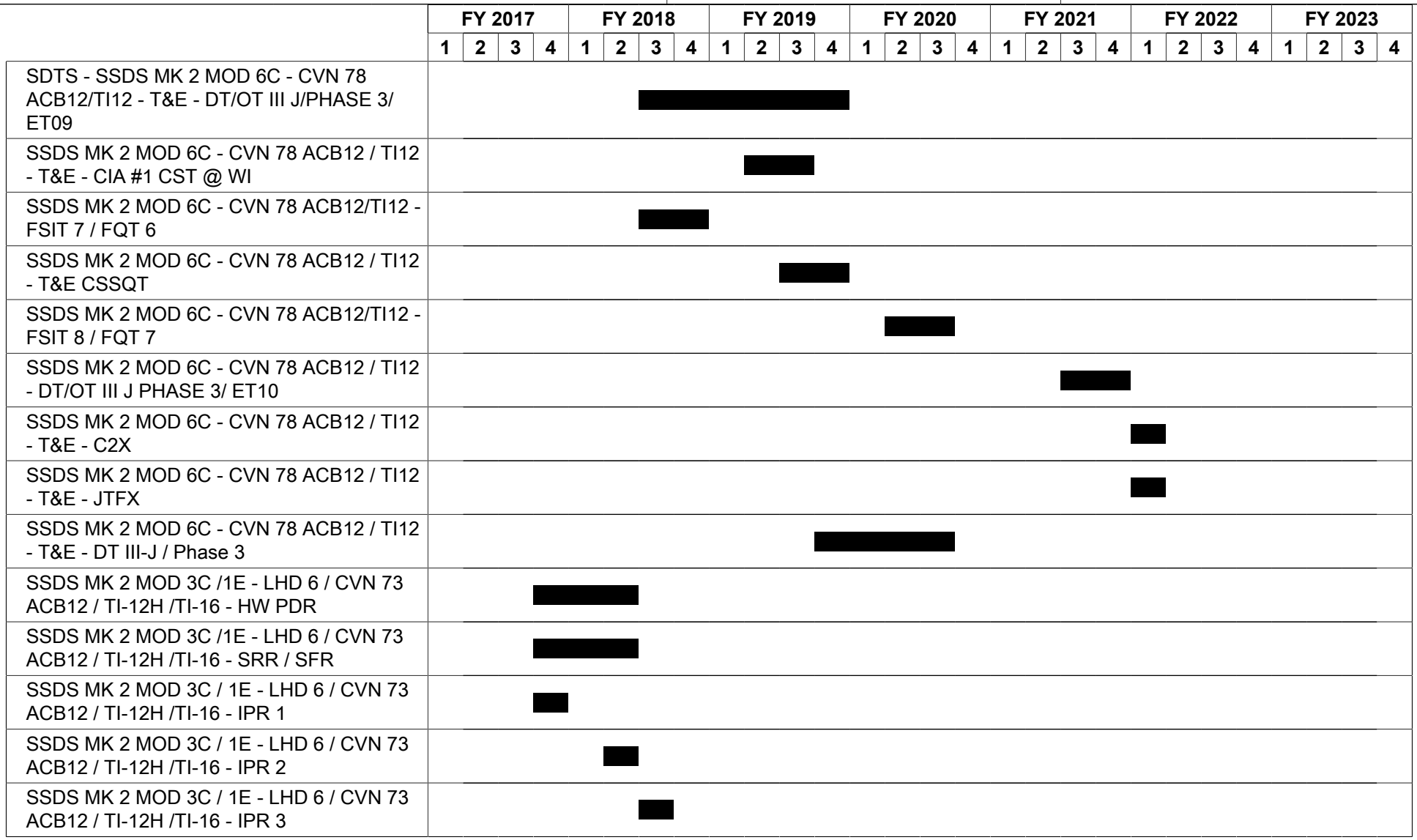


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

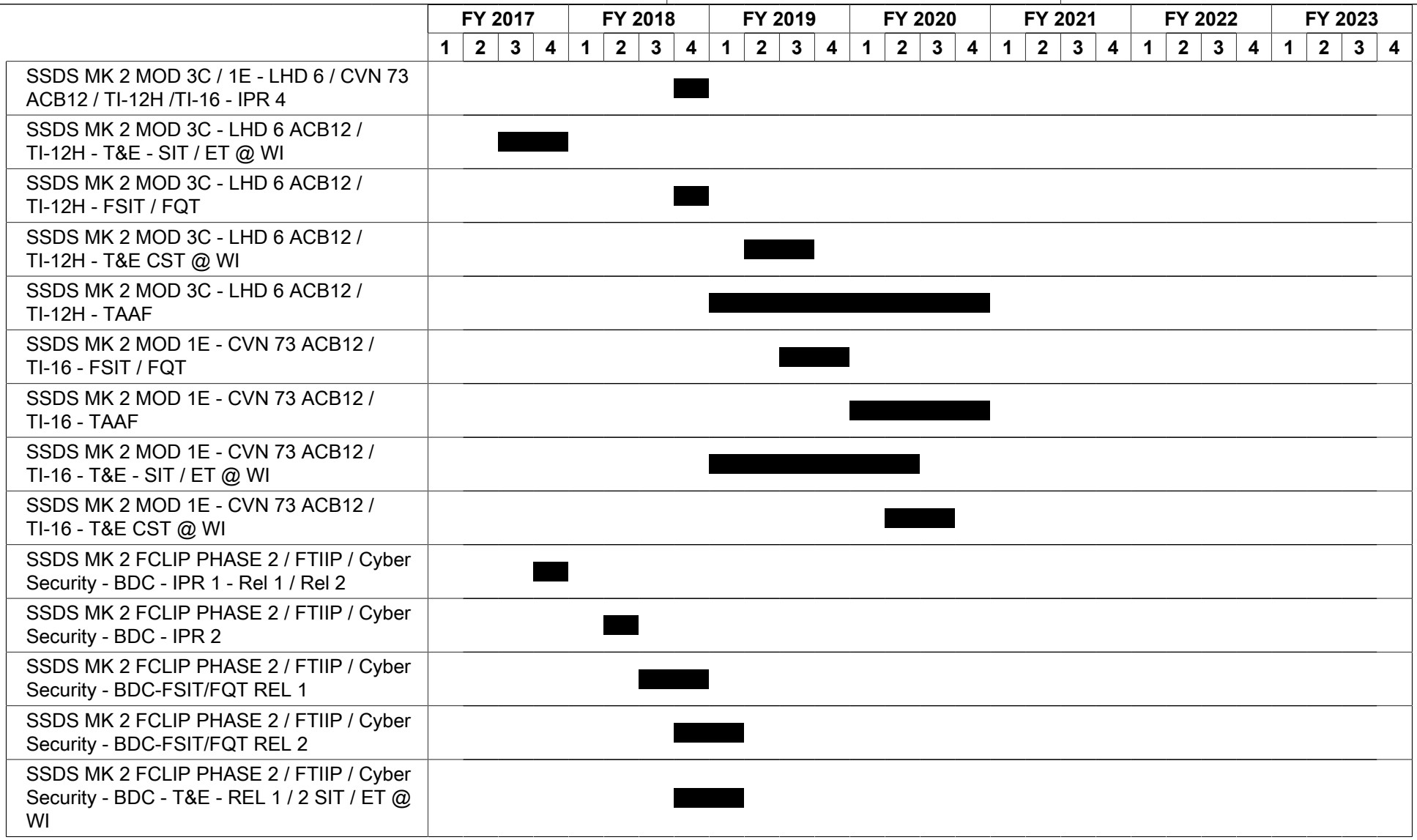


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

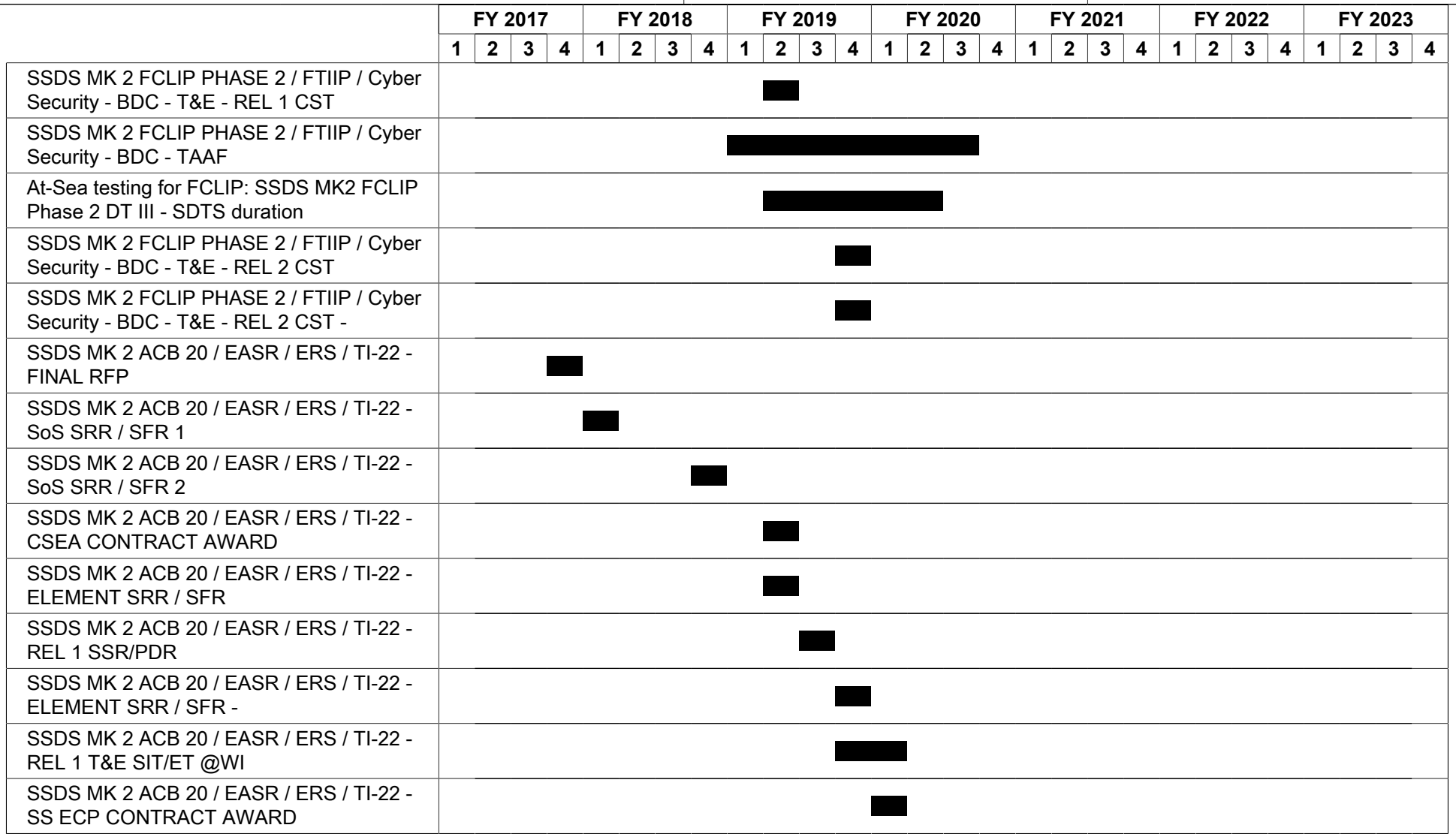


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

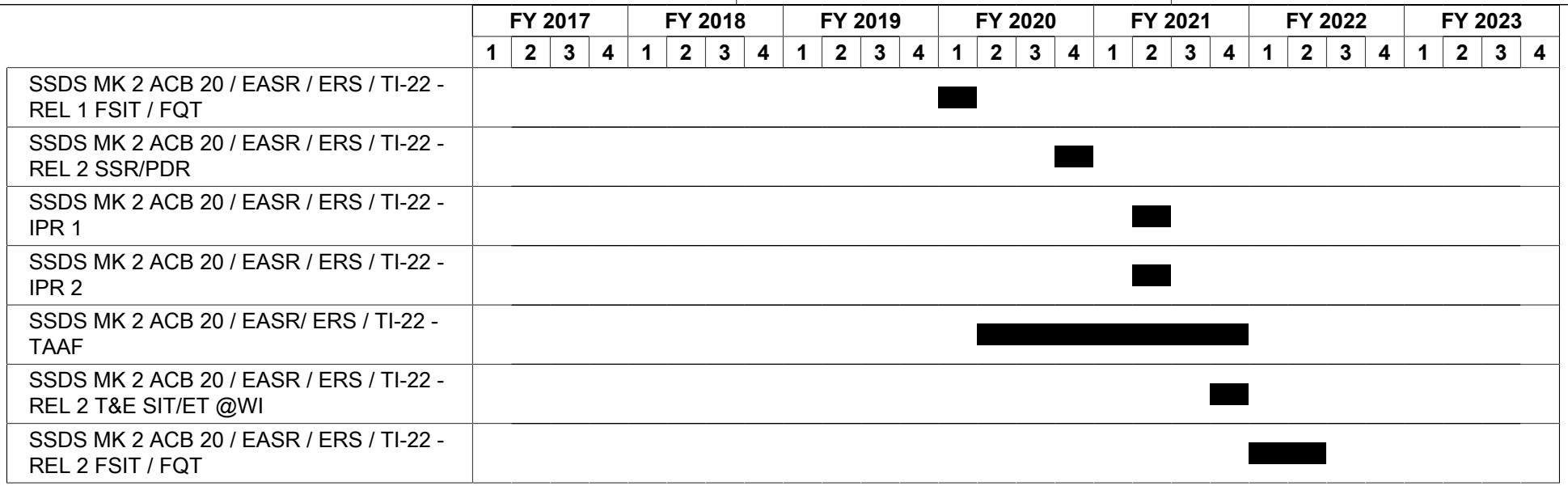


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2178				
SSDS MK 2 MOD 5C (LSD) - TI-12 / TI-12H (BUILD 9) TAAF	4	2017	3	2020
SSDS MK2 Mod 5C (DT-III-I Phase 1) CVI	4	2017	1	2018
SSDS MK 2 MOD 5C (LSD) - TI-12 / TI-12H (BUILD 10) S/W DCT1	4	2017	3	2020
SSDS MK2 Mod 5C (DT-III-I Phase 1) AD	2	2018	2	2018
SSDS MK 2 MOD 5C (LSD) - FCLIP FSIT / FQT	4	2018	4	2018
SSDS MK2 Mod 5C (OT-III-I Phase 3) CVPA	3	2018	3	2018
SSDS MK 2 MOD 5C (LSD) - TAAF	2	2018	2	2020
SSDS MK2 Mod 5C (DT-III-I Phase 1) AA	4	2018	1	2019
SSDS MK2 Mod 5C (LSD)-T&E-DT Phase 1 @ ICSTF	4	2017	2	2018
SSDS MK2 Mod 5C LSD-T&E CST Build 9 CST	2	2018	3	2018
SSDS MK 2 MOD 5C (LSD) - T&E - LSD 51 CSSQT	3	2018	3	2018
SSDS MK2 Mod 5C LSD-T&E CST Build 10 CST	4	2018	4	2018
SSDS MK 2 MOD 5C (LSD) - T&E - LSD 49 CSSQT - OT III / Phase 2 / ET14	3	2018	3	2018
SSDS MK 2 MOD 5C (LSD) - T&E - (SDTS) - DT/OT III I/PHASE 2/ET12 /TRKEX	3	2018	4	2018
SSDS MK2 Mod 5C (LSD)- T&E - DT Phase 3 / LSD 49	4	2018	4	2018
SSDS MK 2 MOD 3C / 1C - LHD 2 / CVN 72 ACB12 / TI12 - T&E - LHD 2 CSSQT	4	2017	1	2018
SSDS MK 2 MOD 3C / 1C - LHD 2 / CVN 72 ACB12 / TI12 - T&E - CVN 72 CSSQT	4	2017	2	2018
SSDS MK2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - SIT/ET @ WI	4	2017	3	2020
SSDS NMK2 Mod 6C (DT-III-J Phase 1) CVI	4	2018	1	2020
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - / SW DCTI 4	4	2017	2	2018
SSDS NMK2 Mod 6C (DT-III-J Phase 1) AD	3	2020	3	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 4 / FQT 3	4	2017	4	2019
SSDS NMK2 Mod 6C (OT-III-J Phase 3) CVPA	1	2021	2	2021
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 -T&E - DT III J PHASE 3 / ET10 @ CVN 78	3	2017	2	2018
SSDS NMK2 Mod 6C (OT-III-J Phase 3) AA	3	2021	4	2021
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 5 / FQT 4	2	2017	3	2017
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 -T&E CST EVENT(S) @ WI	2	2018	3	2020
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - TEST ANALYZE & FIX (TAAF)	4	2017	2	2020
SDTS - SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FCL RISK REDUCTION TRKEX / MSLEX	2	2018	3	2018
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 6 / FQT 5	2	2018	3	2018
SDTS - SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - T&E - DT/OT III J/PHASE 3/ ET09	3	2018	4	2019
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - CIA #1 CST @ WI	2	2019	3	2019
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 7 / FQT 6	3	2018	4	2018
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E CSSQT	3	2019	4	2019
SSDS MK 2 MOD 6C - CVN 78 ACB12/TI12 - FSIT 8 / FQT 7	2	2020	3	2020
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - DT/OT III J PHASE 3/ ET10	3	2021	4	2021
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - C2X	1	2022	1	2022
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - JTFX	1	2022	1	2022
SSDS MK 2 MOD 6C - CVN 78 ACB12 / TI12 - T&E - DT III-J / Phase 3	4	2019	3	2020
SSDS MK 2 MOD 3C /1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - HW PDR	4	2017	2	2018
SSDS MK 2 MOD 3C /1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - SRR / SFR	4	2017	2	2018
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 1	4	2017	4	2017
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 2	2	2018	2	2018
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 3	3	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 4	4	2018	4	2018
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - T&E - SIT / ET @ WI	3	2017	4	2017
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - FSIT / FQT	4	2018	4	2018
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - T&E CST @ WI	2	2019	3	2019
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - TAAF	1	2019	4	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - FSIT / FQT	3	2019	4	2019
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - TAAF	1	2020	4	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - T&E - SIT / ET @ WI	1	2019	2	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - T&E CST @ WI	2	2020	3	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - IPR 1 - Rel 1 / Rel 2	4	2017	4	2017
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - IPR 2	2	2018	2	2018
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC-FSIT/FQT REL 1	3	2018	4	2018
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC-FSIT/FQT REL 2	4	2018	1	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 1 / 2 SIT / ET @ WI	4	2018	1	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 1 CST	2	2019	2	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - TAAF	1	2019	3	2020
At-Sea testing for FCLIP: SSDS MK2 FCLIP Phase 2 DT III - SDTS duration	2	2019	2	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 2 CST	4	2019	4	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 2 CST -	4	2019	4	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - FINAL RFP	4	2017	4	2017
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SoS SRR / SFR 1	1	2018	1	2018
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SoS SRR / SFR 2	4	2018	4	2018
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - CSEA CONTRACT AWARD	2	2019	2	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - ELEMENT SRR / SFR	2	2019	2	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 SSR/PDR	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 2178 / *QRCC*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - ELEMENT SRR / SFR -	4	2019	4	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 T&E SIT/ET @WI	4	2019	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SS ECP CONTRACT AWARD	1	2020	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 FSIT / FQT	1	2020	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 SSR/PDR	4	2020	4	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - IPR 1	2	2021	2	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - IPR 2	2	2021	2	2021
SSDS MK 2 ACB 20 / EASR/ ERS / TI-22 - TAAF	2	2020	4	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 T&E SIT/ET @WI	4	2021	4	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 FSIT / FQT	1	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 3172 / *Joint Non-Lethal Weapons*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3172: *Joint Non-Lethal Weapons*	40.427	4.177	5.177	2.892	1.100	3.992	3.018	3.085	3.142	3.213	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Develop non-lethal weapon systems in support of anti-terrorism/force protection missions. Technologies include, but are not limited to: ocular interrupters, propulsion occlusion systems, and acoustic hailing devices. Current efforts are focused on the Long-Range Ocular Interrupter (LROI), Hailing Acoustic Laser and Light Tactical System (HALLTS), and Maritime Vessel Stopper (MVS) technologies. The LROI is intended to provide the U.S. Navy with the capability to deliver a bright light producing a dazzling or glare effect on a closing target to warn and/or suppress potential threats through increasing levels of visual degradation. The planned LROI will generate controlled, high-intensity output, providing warning and suppression effects. The extended range capability of LROI will effectively increase tactical decision-making time in support of escalation of force (EoF) tactics, techniques and procedures (TTP) across a broad range of military operations (ROMO). Further, the LROI will enhance Joint Force operations in determining the intent of a potential threat as early as possible.

HALLTS is a single-operator, personnel-portable, hailing and warning system developed to enhance the ability of security forces to effectively execute escalation of force and intent determination procedures. HALLTS integrates three commercial off-the-shelf (COTS) Navy-fielded non-lethal devices consisting of an acoustic hailing device, a high intensity white light and a dazzling LA-9/P green beam laser. HALLTS utilizes a common system controller interface and common mounting options while reducing the manpower requirements for operation of multiple non-lethal devices to more efficiently implement escalation of force procedures.

MVS technologies are systems designed to temporarily disable, slow, or stop waterborne vessels of varying degrees of size and different propulsion types in order to effectively execute escalation of force and intent determination procedures. The MVS technologies will provide the US Navy with lightweight, compact, biodegradable materials, which will stop or slow marine platforms by occlusion of any type of marine propeller or propulsor.

Develop Visual Augmentation Systems (VAS) in support of expeditionary / anti-terrorism / force protection missions. Technologies include, but are not limited to: image intensification devices, thermal imaging systems, and laser systems. Current efforts are focused on the M2HB/M2A1 Weapon Sight (M2WS), VAS Integration within the Advanced Bomb Suit Helmet, Visual Augmentation Module Portable Imager Recorder (VAMPIR), and AN/PVS-31B (White Phosphor) Wide Field of View Goggle. The purpose of the M2WS program is to provide an advanced day/night crew-served weapon sight capability to surface and expeditionary Navy personnel. The M2WS will provide for increased target detection ranges as well as provide for improved firing accuracy to minimize the number of rounds required to successfully hit the target. Integration of VAS within the bomb suit helmet will allow EOD technicians freedom of movement to operate in low light level conditions with a modular sensor/display and will provide increased capability to clearly detect, locate, and identify explosive ordnance. The VAMPIR is a hand-held multi-spectral imaging system that provides situational awareness, allowing the user to detect and recognize potential threat craft at the maximum possible range so that Navy forces can assess nearby craft and engage appropriately. The VAMPIR contains an integrated recording (video/audio) capability which is used to document the incident. The AN/PVS-31B (White Phosphor) Wide Field of View Goggle (WFOV) provides the user with a lightweight/white phosphor goggle with an increased field of view (FOV) from 40 degrees to 80

degrees. The increase in FOV provides the user with an additional 30% tactical advantage and improved situational awareness. The AN/PVS-31B WFOV enhances the user's capability during Close Quarters Combat (CQC) and Counter-IED threat identification/defeat missions.

OCO funding will be used to conduct necessary research and development to satisfy current Visual Augmentation Systems (VAS) capability gap defined for expeditionary warfighters. Expeditionary force must maintain situational awareness by using VAS equipment in operational conditions during low-light and no-light environments to obtain and maintain battlefield dominance during missions to Find, Fix, Track, Target, Engage and Assess (F2T2EA) enemy combatants. References: COMNECC ltr Ser N43/695 dated 2 Oct 14 (Visual Augmentation System Capability Requirements and Associated Capability Gaps); endorsed by USFFC ltr Ser N8/ N9/014 dated 17 Dec 14; approved by OPNAV N957 ltr Ser 17U140063 dated 23 May 17.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Joint Non-Lethal Weapons Development	4.177	5.177	2.892	1.100	3.992
Articles:	-	-	-	1	1
FY 2018 Plans: Complete Long Range Ocular Interrupter (LROI) program of record transition. Develop next generation solution that meets or exceeds LROI Letter of Requirement and issue RFP. Continue performing HALLTS engineering updates previously identified and continue to solicit Fleet user feedback. Continue development of dual-mount solution and required documentation, and conduct test and evaluation. Effort will include all acquisition documents leading up to RFP to fully meet the fielding requirements of units to NECC. Continue to pursue technologies that satisfy the occlusion requirements of the Maritime Vessel Stopping (MVS) Capability Development Document (CDD), refining both requirements and requirements documentation.					
FY 2019 Base Plans: Ensure HALLTS units are fielded to NECC to meet their unit requirements. Continue development of next generation LROI Letter of Requirement solution and implement any additional engineering updates as needed. Continue developing the MVS occlusion technologies and all acquisition documents leading up to RFP.					
FY 2019 OCO Plans: Will conduct necessary research and prototype development to determine a material solution to satisfy current Visual Augmentation Systems (VAS) capability gaps encountered during missions in combat zones while in theater. The warfighter lacks the ability to detect and recognize potential threat craft at the maximum possible range and at the earliest time in all weather environments during day and night. In addition, the warfighter needs the ability to record both audio/video encounters and incidents for after action reporting. Visual Augmentation					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Systems are necessary to avoid accidental engagement of non-combatants while maintaining the greatest possible distance from threats. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY18 to FY19 due to research and development phase for the LROI nearing completion; procurement of the system will begin in FY19.					
Accomplishments/Planned Programs Subtotals	4.177	5.177	2.892	1.100	3.992

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/8128: *NCW Forces Active*	5.744	6.235	7.805	-	7.805	7.805	7.961	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

The initial Long Range Ocular Interrupter (LROI) systems were designed, developed, and deployed as a Rapid Acquisition. Following an FY16 Military Utility Assessment (MUA), the LROI was recommended to
be a Program of Record (PoR), with engineering changes being made in the next generation to meet issues identified in the MUA. Once the PoR is established, a final developmental Technical Data Package (TDP) will be developed with user input incorporated. The developmental TDP will be included in the Request for Proposal (RFP) to industry to be further refined for a production-level TDP to be used for PoR. The RFP will be provided to industry to solicit offers for LRIP production after refining the TDP; subsequently, it will be provided to industry for full rate production.

The initial Hailing Acoustic Laser and Light Tactical System (HALLTS) systems were designed and developed using Physical Security Enterprise & Analysis Group (PSEAG) RDT&E funding. HALLTS units were included in the MUA in order to receive Fleet feedback and identify any needed engineering changes, including the development of a dual-mount to support HALLTS use by Navy Expeditionary Combat Command (NECC). A developmental Technical Data Package (TDP) will include user input. The RFP, including the TDP, will be provided to industry to solicit offers for LRIP and subsequently Full Rate Production.

The development of the M2WS will occur through two separately funded phases. Phase I was funded in FY 2016/2017 and consists of developing Production Demonstration Models (PDM) that are in accordance with all Performance Specification (PSPEC) requirements. Phase II will provide low rate initial production representative units which comply with all system requirements and subsequently for full rate production for a total of 825 systems to be fielded to NECC.
Initial VAMPIR systems will be developed and tested based on KPPs identified. These units will go through user assessment for their feedback. ECP will be performed to incorporate user inputs. The RFP, including the developmental TDP, will be provided to the industry to solicit offers for the LRIP production after refining the TDP and subsequently for full rate production for a total of 200 VAMPIR systems to be fielded to NECC.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

E. Performance Metrics

Transition to Program of Record (PoR) and development of next generation Long Range Ocular Interrupter (LROI), which will meet identified Fleet requirements. Develop Technical Data Package (TDP) that informs the related acquisition documents found in the RFP package. Develop Hailing Acoustic Laser and Light Tactical System (HALLTS) TDP and dual-mount design that satisfy the requirements of Navy Expeditionary Combat Command (NECC).

Successfully produce M2WS and VAMPIR systems to support NECC mission requirements and transition to FRP within the VAS PoR. Successfully conduct testing and fielding to fleet users.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering	WR	NSWC Panama City : Panama City, FL	0.000	0.000		0.000		0.487	Jan 2019	-		0.487	Continuing	Continuing	Continuing
System Engineering	WR	NSWC Carderock : Carderock, MD	0.000	0.000		2.000	Apr 2018	0.000		-		0.000	Continuing	Continuing	Continuing
System Engineering	WR	NSWC Dahlgren : Dahlgren VA	14.855	2.202	Nov 2016	1.452	Jan 2018	1.123	Jan 2019	-		1.123	Continuing	Continuing	Continuing
System Engineering	WR	NSWC Port Hueneme : Port Hueneme CA	0.628	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
System Engineering	WR	NSWC Crane : Crane IN	0.580	0.000		0.353	Jan 2018	0.333	Jan 2019	1.100	Jan 2019	1.433	Continuing	Continuing	Continuing
		Subtotal	16.063	2.202		3.805		1.943		1.100		3.043	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Services (NSWC)	WR	NSWC Dahlgren : Dahlgren, VA	4.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management	WR	NUWC Newport : Newport, RI	2.857	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Engineering Services (NSWC)	WR	NSWC Panama City : Panama City, FL	1.200	0.875	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	8.057	0.875		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NSWC Dahlgren : Dahlgren VA	2.800	0.500	Nov 2016	0.309	Jan 2018	0.309	Jan 2019	-		0.309	Continuing	Continuing	Continuing
Test and Evaluation	MIPR	Military Sealift Command : Washington DC	2.200	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test and Evaluation	WR	NSWC Carderock : Carderock MD	0.000	0.000		0.193	Apr 2018	0.074	Jan 2019	-		0.074	Continuing	Continuing	Continuing
Test and Evaluation	WR	COMOPTEVFOR : Norfolk VA	4.925	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	9.925	0.500		0.502		0.383		-		0.383	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	WR	NSWC Carderock : Carderock MD	0.000	0.000		0.635	Jan 2018	0.328	Jan 2019	-		0.328	Continuing	Continuing	Continuing
Program Management	WR	NSWC Dahlgren : Dahlgren VA	6.364	0.600	Nov 2016	0.235	Jan 2018	0.238	Jan 2019	-		0.238	Continuing	Continuing	Continuing
DAWDF	Various	Not Specified : Not Specified	0.018	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	6.382	0.600		0.870		0.566		-		0.566	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	40.427	4.177		5.177		2.892		1.100		3.992	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

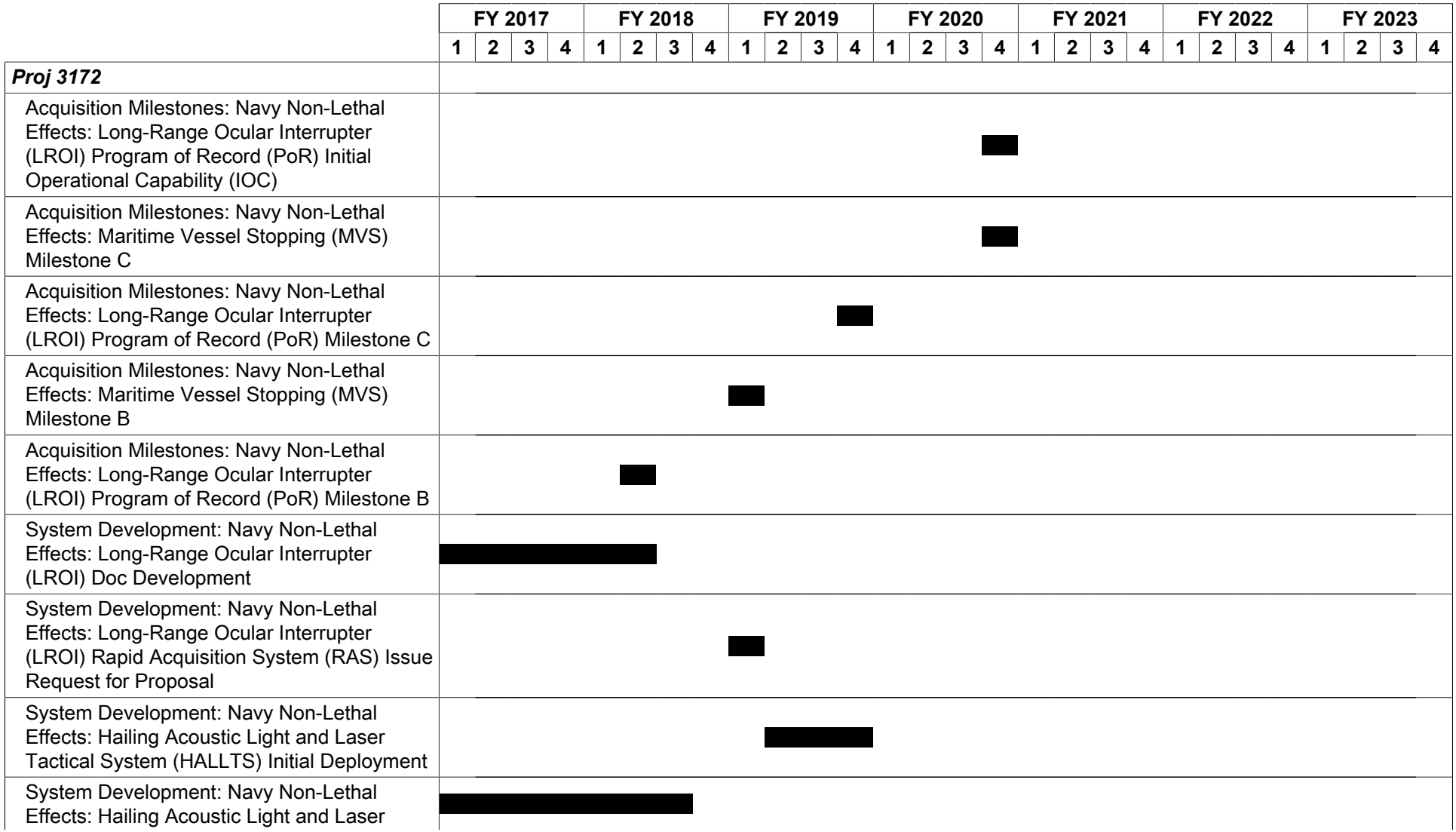


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

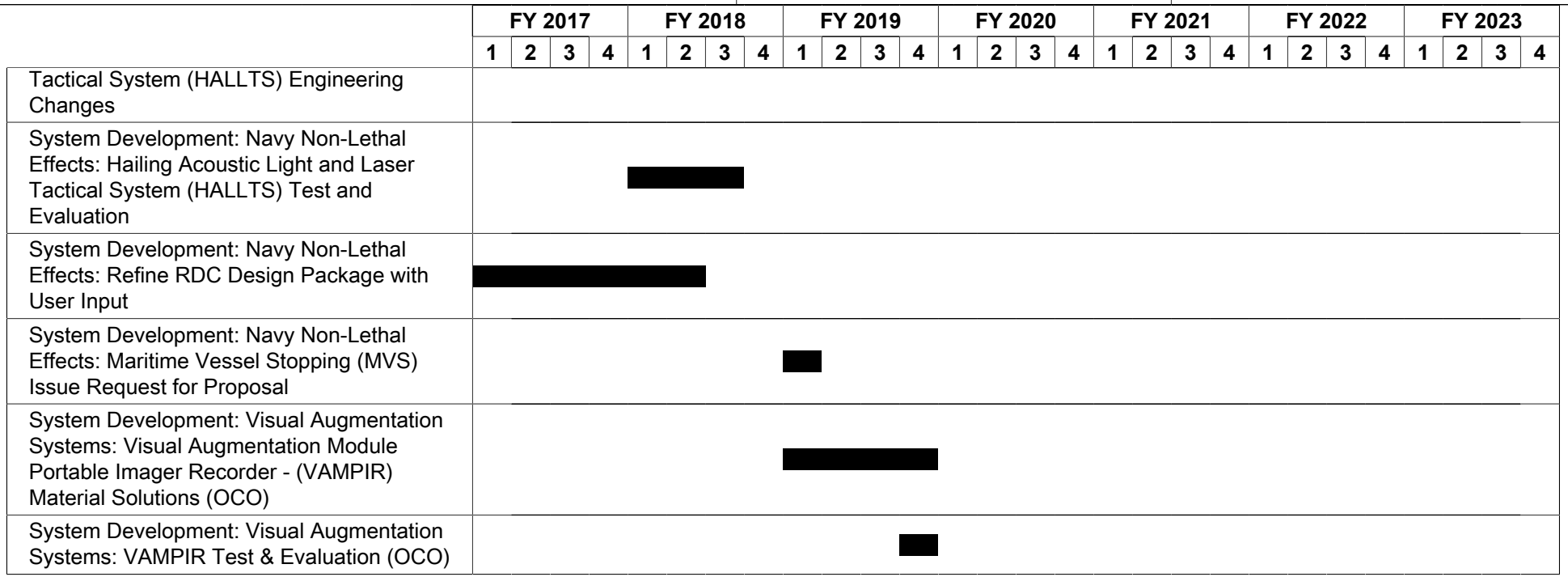


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3172				
Acquisition Milestones: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Program of Record (PoR) Initial Operational Capability (IOC)	4	2020	4	2020
Acquisition Milestones: Navy Non-Lethal Effects: Maritime Vessel Stopping (MVS) Milestone C	4	2020	4	2020
Acquisition Milestones: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Program of Record (PoR) Milestone C	4	2019	4	2019
Acquisition Milestones: Navy Non-Lethal Effects: Maritime Vessel Stopping (MVS) Milestone B	1	2019	1	2019
Acquisition Milestones: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Program of Record (PoR) Milestone B	2	2018	2	2018
System Development: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Doc Development	1	2017	2	2018
System Development: Navy Non-Lethal Effects: Long-Range Ocular Interrupter (LROI) Rapid Acquisition System (RAS) Issue Request for Proposal	1	2019	1	2019
System Development: Navy Non-Lethal Effects: Hailing Acoustic Light and Laser Tactical System (HALLTS) Initial Deployment	2	2019	4	2019
System Development: Navy Non-Lethal Effects: Hailing Acoustic Light and Laser Tactical System (HALLTS) Engineering Changes	1	2017	3	2018
System Development: Navy Non-Lethal Effects: Hailing Acoustic Light and Laser Tactical System (HALLTS) Test and Evaluation	1	2018	3	2018
System Development: Navy Non-Lethal Effects: Refine RDC Design Package with User Input	1	2017	2	2018
System Development: Navy Non-Lethal Effects: Maritime Vessel Stopping (MVS) Issue Request for Proposal	1	2019	1	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3172 / *Joint Non-Lethal Weapons*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: Visual Augmentation Systems: Visual Augmentation Module Portable Imager Recorder - (VAMPIR) Material Solutions (OCO)	1	2019	4	2019
System Development: Visual Augmentation Systems: VAMPIR Test & Evaluation (OCO)	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 3358 / *SSDS Training Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3358: *SSDS Training Improvement Program*	8.978	2.807	7.554	7.831	-	7.831	8.557	9.920	9.659	9.099	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

SSDS Training Improvement Program provides enhancements and upgrades to the SSDS Total Ship Training Capability (TSTC) components within the combat system, combat system elements, Battle-Force Tactical Training (BFTT), and Advanced Training Domain (ATD) to address needs for increased training capability and functionality in conjunction with SSDS MK2 Advanced Capability Builds (ACB)/Fire Control Loop Improvement Project (FCLIP), Far-Term Interoperability Improvement Project (FTIIP), Task Force Cyber Awakening (TFCA) Boundary Defense Capability (BDC), and Technical Insertion efforts under PU 2178 (QRCC). These enhancements will address current and future training requirements by implementing new functionality to enable the individual warfighter through distributed battle group events to engage in more complex training requirements to support fleet required training certification events. Capability Development and integration are related to Self Defense, Underwater, Surface, and other warfare areas. Capability enhancements and upgrades include development of re-useable common components that can be leveraged by SSDS MK2 combat systems, and/or integration of re-usable common components developed by the TSTC/BFTT Program and AEGIS Advanced Training Domain (ATD)/TSTC Total Ship Training Capability (TSTC) projects to meet AEGIS combat system training requirements. TSTC continues to integrate and update, as new tactical capabilities are being introduced, to enable crew operator proficiency training for basic and sustainment level training events, through distributed strike group certification fleet synthetic training (FST) events and including COMPTUEX FST at Sea integration into Live, Virtual and Constructive (LVC) environment. Continued Development is required to integrate new capabilities and interfaces to provide training for AEGIS and SSDS combat system capability upgrades, and to address the Fleet's Live, Virtual and Constructive (LVC) Fleet Training Wholeness initiative. Additionally, modernization is needed to support the DoD Training Transformation Plan, the Chief of Naval Operations Fleet Response Plan and Commander United States Fleet Forces Command Fleet Readiness Training Plan.

The Advanced Training Domain (ATD) is being developed to combine BFTT and the AEGIS Combat Training System (ACTS) into a common system that integrates with AEGIS BL 9.2.2AF, and SSDS BL 11.xAF. ATD is being hosted along with the AEGIS and SSDS combat system on TI-16 common processing and display hardware. ATD is being designed to be the core of the Total Ship Training Capability, and is projected to be more reliable, simpler to use, and architected to be extensible to meet interoperability and capability enhancement challenges in the future.

The BFTT is being updated to maintain integration and capability enhancements developed for the Cooperative Engagement Capability (CEC), Surface Electronic Warfare Improvement Program (SEWIP), and the Carrier Tactical Support Center (CV-TSC), and SSDS Fire Control Loop Improvement Program.

TSTC provides realistic joint warfare training across the spectrum of armed conflict, realistic unit level team training in all warfare areas (e.g. NIFC-CA and BMD missions to support IAMD). TSTC provides ships' Commanding Officers and Battle Group/Battle Force Commanders with the ability to conduct coordinated realistic, high stress, combat system level team training as an integral part of the Afloat Training Organization, the Tactical Training Groups and C2F/C3F FST/LVC events.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

Develop and integrate MH-60R simulator to enable embedded shipboard training in support of basic and sustainment training, as well as establishes the pathway to support pier-side Fleet Synthetic Training (FST) events.

Develop and Integrate Cooperative Engagement Capability (CEC) Enhanced Training (CET) to support basic and sustainment level training, as well as provide ability to distribute and establish CEC data link during pier-side fleet synthetic training exercises. CET will also provide enable proficiency training of NIFC-CA capability.

Develop and integrate CEC Interim Training (CIT) capability to support pier-side fleet synthetic training events. This is an interim capability support the distributed portion of the CET capability, until CET is fully deployed. This supports training of strike groups of new tactical capabilities that were integrated into the AEGIS BL9 ships, and provides the necessary functionality to allow ships to train as a strike group.

Develop and integrate upgrades to Battle-Force Electronic Warfare Trainer (BEWT) to support soft kill training with NULKA.

Develop Identification Friend or Foe (IFF) simulator to enable training of Modes 1, 2, 3A, 4, C, 5 and S on both AEGIS and SSDS ships. Capability will support AEGIS and SSDS IFF MODE 4/5 Integration program will address training Mode 4 Inoculation, and allow training of Modes 5 and S IFF.

Develop and integrate commensurate training improvements to SSDS ACB 20 for Enhanced Sea Sparrow Missile (ESSM) and Electronic Warfare (EW) tactical improvements.

Integrate Navy Continuous Training Environment (NCTE) networking and cyber security upgrades maintain authorization to participate in distributed shipboard training events.

TSTC integrated on SSDS provides the capability to complete system and operational level testing of the combat system.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SSDS Total Ship Training Capability	2.807	7.554	7.831	0.000	7.831
Articles:	-	-	-	-	-
FY 2018 Plans: - For the SSDS MK2 ACB-20 Baseline, initiate the development of the requirements to support ESSM Block 2 simulation increased capability against closely spaced objects, and stream raids. Provide 2T uplink simulation that provided continuous targeting data to synthetic ESSM missile through intercept. - For the SSDS MK2 ACB-20 Baseline, initiate the development of the requirements to provide training for integrated and optimized employment of decoys, Electronic Attack (EA), and hard kill and soft kill weapons					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
effects against emerging threats. Provide the capability to support training with Soft Kill Coordination, EW Battle Management, and AOEW. - Continue development of re-hosting Battle Force Tactical Training (BFTT) / Advanced Training Domain (ATD) capability into SSDS MK2 TI-16 Hardware. Develop final design and begin implementation in support of installation on CVN-73 and future baselines. - Continue supporting the development of Cooperative Engagement Capability (CEC) integrated training in support of Fleet Synthetic Training (FST). Support phase 3 (CEC Tactical Software Full Training Support) CEC Interim Training Capability (CIT). - Continue requirements to support simulating real world environments within SSDS MK2 shipboard sensors for Anti-Access / Area Denial (A2AD) training. ***FY 2019 Base Plans:*** - Initiate requirements for the SSDS Integrated Combat System (ICS) that will provide SSDS ships the ability to train using Live-Virtual-Constructive (LVC). LVC will improve the Navy's competitive advantage via high end training and enable contested environment strike group training in accordance with strategic documents. - For the SSDS MK2 ACB-20 Baseline, continue the development of the requirements to support ESSM Block 2 simulation increased capability against closely spaced objects, and stream raids. Provide 2T uplink simulation that provided continuous targeting data to synthetic ESSM missile through intercept. - For the SSDS MK2 ACB-20 Baseline, continue the design and development for integrated and optimized employment of decoys, Electronic Attack (EA), and hard kill and soft kill weapons effects against emerging threats. Provide the capability to support training with Soft Kill Coordination, EW Battle Management, and AOEW. - Continue development of re-hosting Battle Force Tactical Training (BFTT) / Advanced Training Domain (ATD) capability into SSDS MK2 TI-16 Hardware. Continue development and integration of this capability in support of installation on CVN-73 and future SSDS baselines.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue supporting the development of Cooperative Engagement Capability (CEC) integrated training in support of Fleet Synthetic Training. Continue systems engineering of CEC Tactical Software Full Training Support. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Accomplishments/Planned Programs Subtotals	2.807	7.554	7.831	0.000	7.831

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTEN/0204571N/1427: *Surface Tactical Team Trainer (PU 1427)*	12.145	15.274	32.433	-	32.433	43.236	34.644	24.140	17.717	Continuing	Continuing
• RDTEN/0604307N/3357: *AEGIS Training Improv. Prog. (PU 3357)*	10.355	7.856	6.946	-	6.946	7.863	7.766	6.404	5.474	Continuing	Continuing

Remarks

D. Acquisition Strategy

For the SSDS MK2 software development, including the integration of TSTC software improvements and the TI-16 Open Architecture Computing Environment, the acquisition strategy identified for SSDS MK2 for QRCC Project (PU 2178) (R-2A exhibit) applies.

E. Performance Metrics

Performance metrics for SSDS MK2 for QRCC Project (PU 2178) apply (R-2A exhibit). The milestones identified in the R-4A exhibit for PU2178 apply for the CVN78 SSDS MK2 ACB-12 / TI-12 baseline development and the integration of the DBR simulation software to provide CVN78 in-port and underway fire control loop training capabilities. The milestones for implementation of TSTC improvements into future SSDS MK2 ICS baselines for the SSDS MK2 FCLIP Phase 2 / FTIIP / Cyber Security BDC, and ACB-20 / EASR / ERS baselines in QRCC Project (PU 2178) apply and are listed in the R-4A exhibits for PU 3358.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604755N / *Ship Self Def (Detect & Cntrl)*	Project (Number/Name) 3358 / *SSDS Training Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSTC Sys Eng / Safety	WR	DD : Dahlgren, VA	0.288	0.135	Nov 2016	0.350	Nov 2017	0.350	Nov 2018	-		0.350	Continuing	Continuing	Continuing
TSTC Sys Eng / ILS	WR	DN : Dam Neck, VA	1.370	0.916	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
TSTC Sys Eng / Integration	C/CPIF	RSC IIS (4112) : Suffolk, VA	1.076	0.000		0.079	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
TSTC TDL Gateway	WR	SPAWAR PMW 150 : San Diego, CA	0.206	0.215	Dec 2016	0.000		0.220	Nov 2018	-		0.220	0.000	0.641	-
TSTC Sys Eng / PSEA	SS/CPIF	RSC (5128) : San Diego, CA	1.688	1.407	Dec 2016	1.665	Nov 2017	1.701	Nov 2018	-		1.701	Continuing	Continuing	Continuing
TSTC Sys Eng / MH-60R Training Capability	WR	Keyport (NUWC) : Keyport, RI	0.275	0.134	Nov 2016	0.750	Nov 2017	0.500	Nov 2018	-		0.500	Continuing	Continuing	Continuing
TSTC Planning Support	C/CPIF	TMB : Washington, DC	0.025	0.000		0.000		0.000		-		0.000	0.000	0.025	-
TSTC ATD	TBD	IWS 1.0 : Washington, DC	0.000	0.000		3.038	Dec 2017	3.390	Dec 2018	-		3.390	0.000	6.428	-
TSTC ESSM BLK2/EW Upgrades	TBD	Various : Various	4.050	0.000		0.000		0.000		-		0.000	0.000	4.050	-
TSTC EW	TBD	IWS 2.0 : Washington, DC	0.000	0.000		1.226	Nov 2017	1.250	Nov 2018	-		1.250	0.000	2.476	-
TSTC NCTE	WR	Corona(NSWC) : Corona, CA	0.000	0.000		0.405	Nov 2017	0.420	Nov 2018	-		0.420	0.000	0.825	-
TSTC GWS	TBD	IWS 3.0 : Washington, DC	0.000	0.000		0.041	Dec 2017	0.000		-		0.000	0.000	0.041	-
		Subtotal	8.978	2.807		7.554		7.831		-		7.831	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.978	2.807		7.554		7.831		-		7.831	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

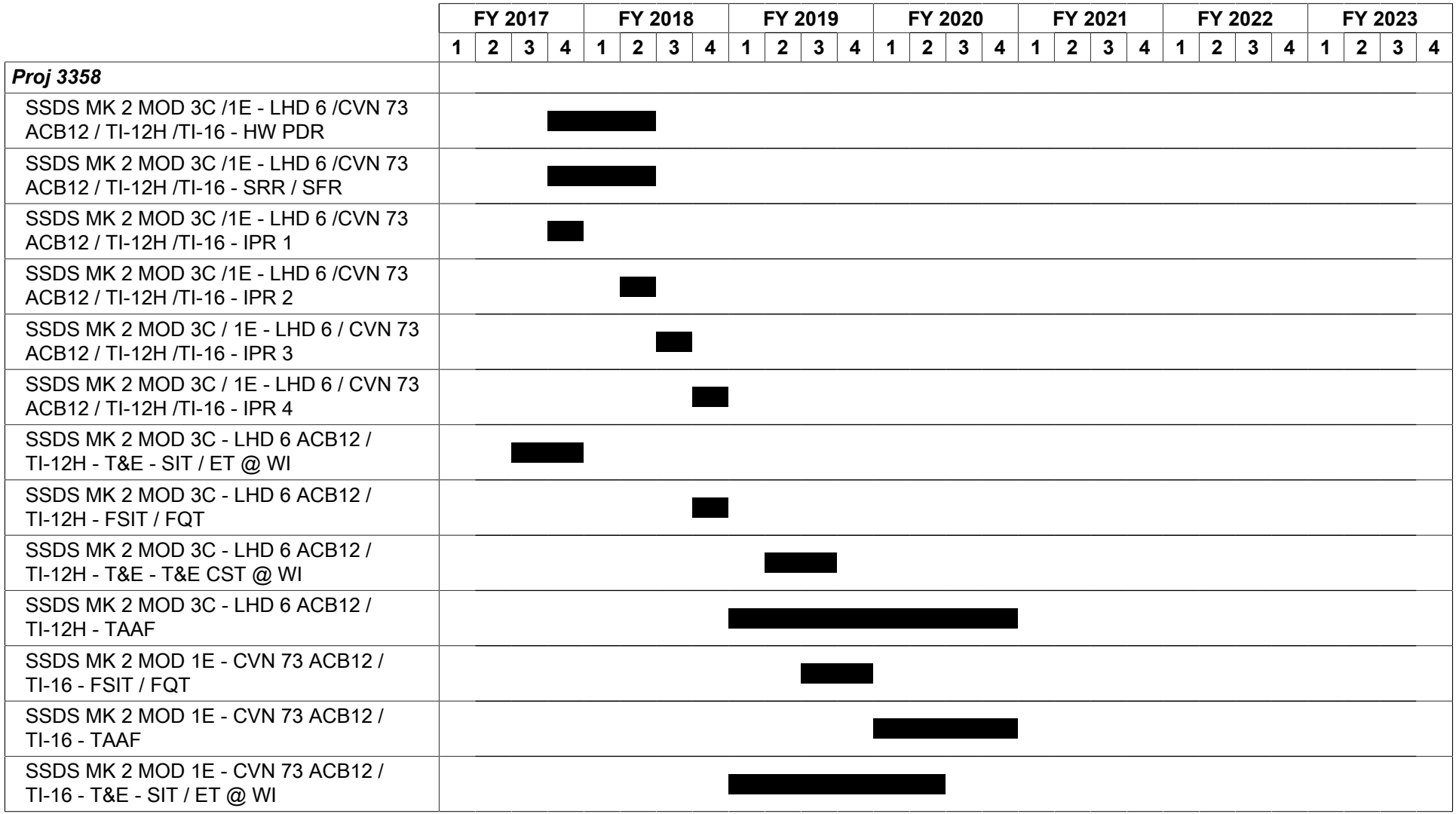


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

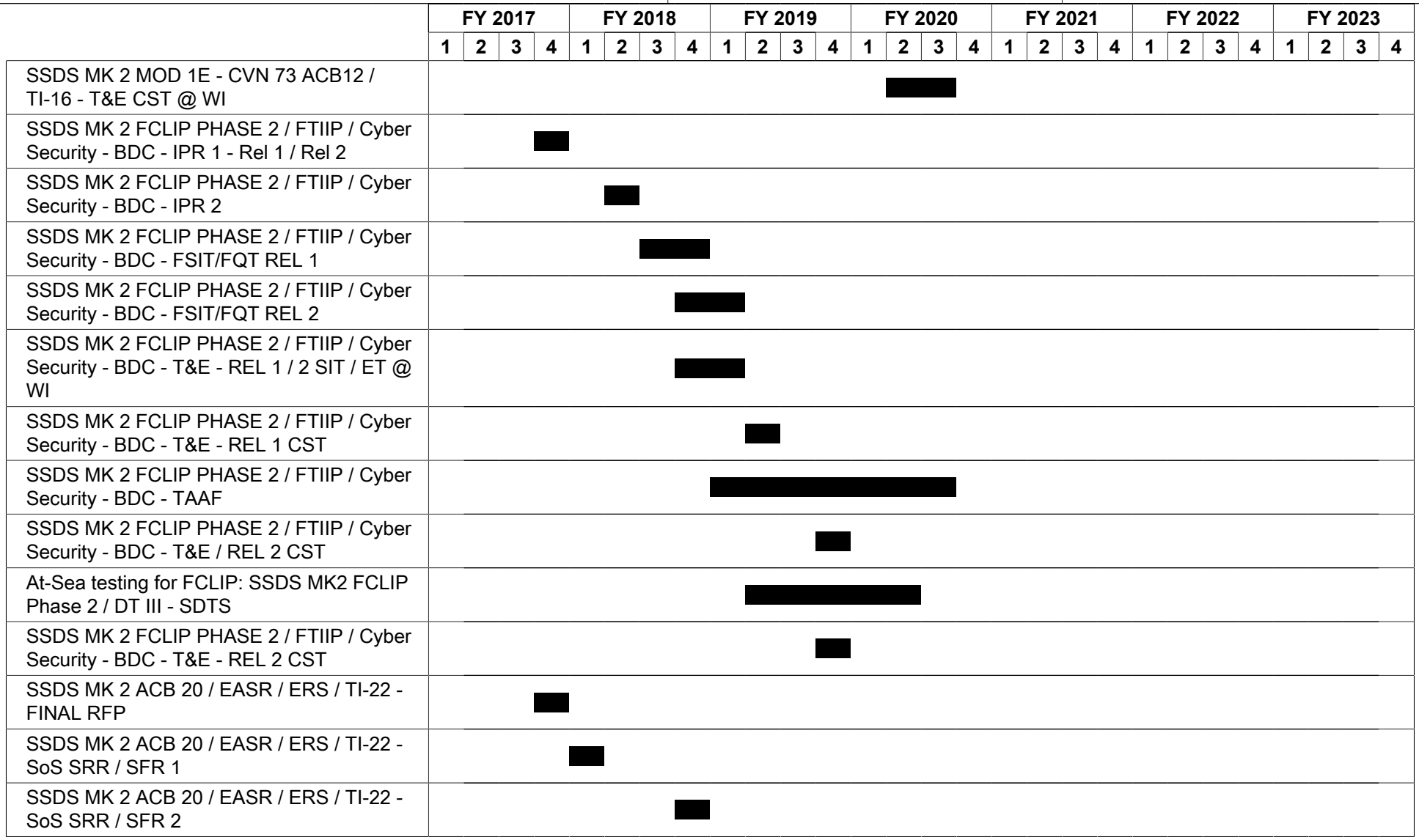


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

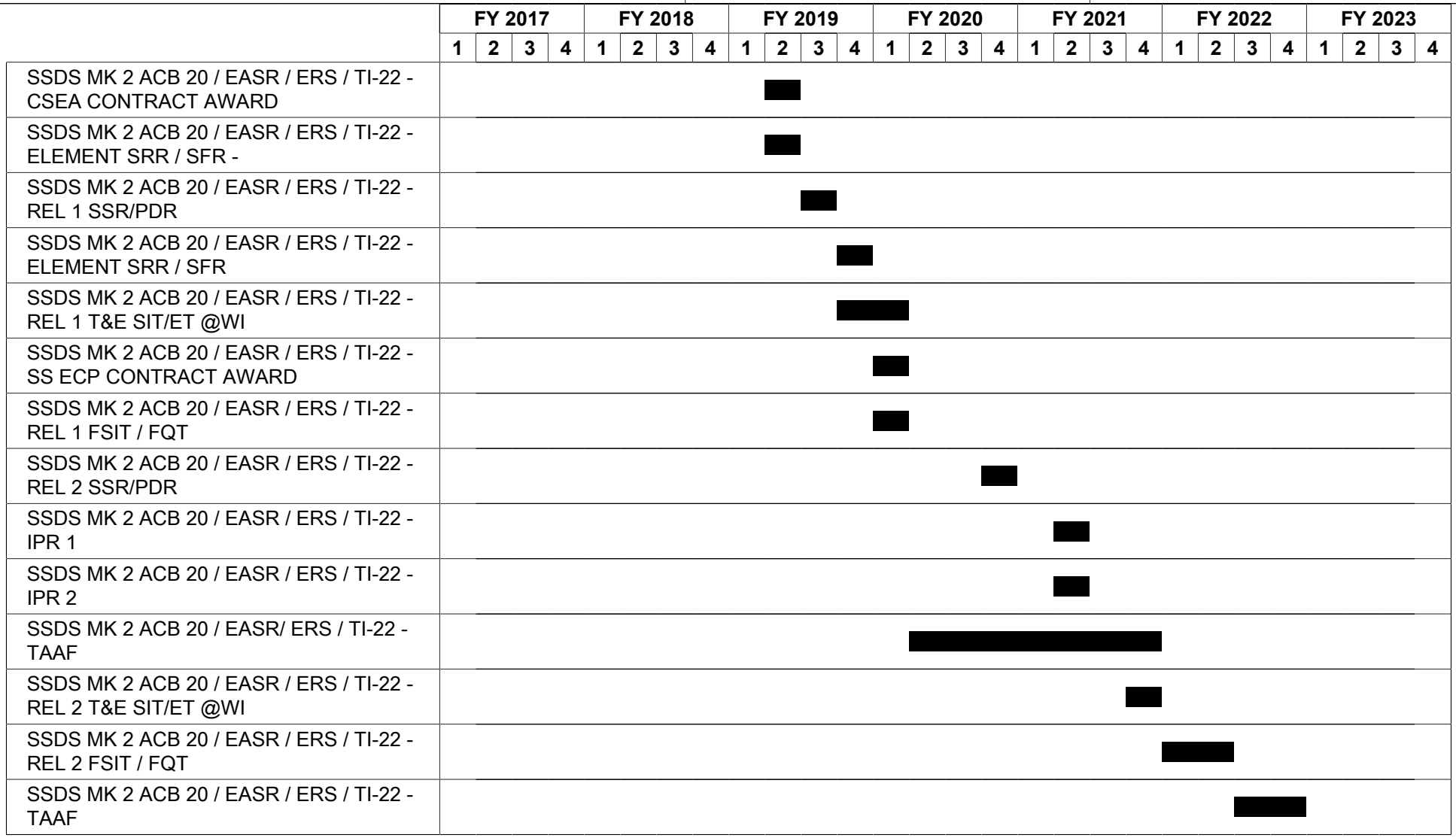


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3358				
SSDS MK 2 MOD 3C /1E - LHD 6 /CVN 73 ACB12 / TI-12H /TI-16 - HW PDR	4	2017	2	2018
SSDS MK 2 MOD 3C /1E - LHD 6 /CVN 73 ACB12 / TI-12H /TI-16 - SRR / SFR	4	2017	2	2018
SSDS MK 2 MOD 3C /1E - LHD 6 /CVN 73 ACB12 / TI-12H /TI-16 - IPR 1	4	2017	4	2017
SSDS MK 2 MOD 3C /1E - LHD 6 /CVN 73 ACB12 / TI-12H /TI-16 - IPR 2	2	2018	2	2018
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 3	3	2018	3	2018
SSDS MK 2 MOD 3C / 1E - LHD 6 / CVN 73 ACB12 / TI-12H /TI-16 - IPR 4	4	2018	4	2018
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - T&E - SIT / ET @ WI	3	2017	4	2017
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - FSIT / FQT	4	2018	4	2018
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - T&E - T&E CST @ WI	2	2019	3	2019
SSDS MK 2 MOD 3C - LHD 6 ACB12 / TI-12H - TAAF	1	2019	4	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - FSIT / FQT	3	2019	4	2019
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - TAAF	1	2020	4	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - T&E - SIT / ET @ WI	1	2019	2	2020
SSDS MK 2 MOD 1E - CVN 73 ACB12 / TI-16 - T&E CST @ WI	2	2020	3	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - IPR 1 - Rel 1 / Rel 2	4	2017	4	2017
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - IPR 2	2	2018	2	2018
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - FSIT/FQT REL 1	3	2018	4	2018
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - FSIT/FQT REL 2	4	2018	1	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 1 / 2 SIT / ET @ WI	4	2018	1	2019
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 1 CST	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604755N / *Ship Self Def (Detect & Cntrl)*	**Project (Number/Name)** 3358 / *SSDS Training Improvement Program*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - TAAF	1	2019	3	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E / REL 2 CST	4	2019	4	2019
At-Sea testing for FCLIP: SSDS MK2 FCLIP Phase 2 / DT III - SDTS	2	2019	2	2020
SSDS MK 2 FCLIP PHASE 2 / FTIIP / Cyber Security - BDC - T&E - REL 2 CST	4	2019	4	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - FINAL RFP	4	2017	4	2017
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SoS SRR / SFR 1	1	2018	1	2018
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SoS SRR / SFR 2	4	2018	4	2018
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - CSEA CONTRACT AWARD	2	2019	2	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - ELEMENT SRR / SFR -	2	2019	2	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 SSR/PDR	3	2019	3	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - ELEMENT SRR / SFR	4	2019	4	2019
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 T&E SIT/ET @WI	4	2019	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - SS ECP CONTRACT AWARD	1	2020	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 1 FSIT / FQT	1	2020	1	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 SSR/PDR	4	2020	4	2020
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - IPR 1	2	2021	2	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - IPR 2	2	2021	2	2021
SSDS MK 2 ACB 20 / EASR/ ERS / TI-22 - TAAF	2	2020	4	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 T&E SIT/ET @WI	4	2021	4	2021
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - REL 2 FSIT / FQT	1	2022	2	2022
SSDS MK 2 ACB 20 / EASR / ERS / TI-22 - TAAF	3	2022	4	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604756N *I Ship Self Def (Engage: Hard Kill)*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	837.373	115.081	212.412	178.538	-	178.538	157.285	129.808	118.655	83.155	Continuing	Continuing
0167: *5in Rolling Airframe Missile*	242.192	17.437	41.178	26.280	-	26.280	22.008	6.248	4.154	4.242	Continuing	Continuing
0173: *NATO Sea Sparrow*	585.311	86.868	134.205	97.694	-	97.694	88.873	79.293	81.011	47.958	Continuing	Continuing
0243: *ALaMO*	0.000	5.594	26.175	24.714	-	24.714	0.000	0.000	0.000	0.000	0.000	56.483
2070: *OTH Missile*	0.000	0.000	0.000	19.968	-	19.968	28.162	26.556	11.349	8.441	Continuing	Continuing
9081: *Phalanx CIWS SEARAM*	6.798	0.346	10.854	9.882	-	9.882	18.242	17.711	22.141	22.514	Continuing	Continuing
9999: *Congressional Adds*	3.072	4.836	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.908

A. Mission Description and Budget Item Justification

This program element provides funding for the development of systems that fulfill a portion of the third phase of the Ship Self Defense: Engage Hard Kill. Development in this line will focus on hard kill capabilities in which missiles are used to intercept incoming Anti-Ship Cruise Missiles (ASCM). Missile and system improvements necessary to meet their requirements are being addressed via NATO SEASPARROW Missile System (NSSMS) (0173), Rolling Airframe Missile (RAM) (0167), Advanced Low Cost Munition Ordnance (ALaMO) (0243), Over-The-Horizon (OTH) missile (2070), and Phalanx Close-In Weapon System (CIWS) SeaRAM (9081). Missile improvements include improved kinematic performance plus advanced seeker and low elevation fusing/warhead capability improvements. CIWS System improvements include Technology Refresh for current and future fleet population. ALaMO (0243) qualifies a guided 57mm projectile with an active seeker for United States Navy (USN) use. ALaMO provides enhanced lethality against Fast In-shore Attack Craft (FIAC) when compared to existing 57mm ammunition.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	114.475	212.412	211.957	-	211.957
Current President's Budget	115.081	212.412	178.538	-	178.538
Total Adjustments	0.606	0.000	-33.419	-	-33.419
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.393	0.000			
• Program Adjustments	0.000	0.000	-30.500	-	-30.500
• Rate/Misc Adjustments	0.000	0.000	-2.919	-	-2.919

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604756N *I Ship Self Def (Engage: Hard Kill)*			
• Congressional General Reductions	-0.001	-	-	-	-
Adjustments					
• Congressional Add Adjustments	5.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Electronics Enclosure Redesign Efforts*	4.836	0.000
Congressional Add Subtotals for Project: 9999	4.836	0.000
Congressional Add Totals for all Projects	4.836	0.000

Change Summary Explanation

The FY 2019 funding request was reduced by $33.419 million between PB 2018 and PB 2019 as follows:

The FY 2019 funding request was reduced by $0.334 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

FY 2019 rate/miscellaneous decreases of $2.585 million is due to changes in the purchase inflation and other rate changes across all projects.

Project 0173 NATO Seasparrow - Funding in the amount of $11.4M was rephased from FY 2019 to FY 2020. The funding rephase adjusts ESSM RDTEN to smooth development ramps and begin tapering in FY 2023 after SSDS IOT&E completes. Stalker supports Improved Stalker (I-Stalker), which will provide incremental improvements to the currently fielded Stalker Long Range Electro-Optic Sensor System (SLREOSS) in response to a 2016 United States Fleet Forces Command (USFFC) Operational Needs Statement (ONS).

Project 9081 CIWS SEARAM - Funding in the amount of $8.0M was rephased and added in the outyears. The three major components of the CIWS Tech Refresh efforts are Electric Gun Drive System, Electronics Enclosure(ELX) Modernization, and Local Control Station (LCS) and Remote Control Station (RCS)Redesign.

Project 2070 OTH Missile - Decrease of $11.1M due to the procurement of Over The Horizon Weapon System (OTH WS)non-recurring mission support equipment, training hardware, and test articles being deferred to the out years.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 0167 / *5in Rolling Airframe Missile*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0167: *5in Rolling Airframe Missile*	242.192	17.437	41.178	26.280	-	26.280	22.008	6.248	4.154	4.242	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The RAM program is an international cooperative program with the government of the Federal Republic of Germany. The purpose of this program is to develop, test, and field a surface-to-air self-defense system utilizing a dual mode, passive radio frequency/infrared RAM. The baseline system RAM Block 0/1/1A provide defense capability against active and passive anti-ship missiles, very low altitude missiles, and maneuvering missiles through the utilization of passive radio frequency and infrared seekers and a maritime optimized fuse. The RAM Block 2 upgrade programs are a cooperative requirement of the U.S. and Federal Republic of Germany, as agreed to in an international Memorandum of Understanding (MOU), and allows RAM to counter emerging, highly maneuverable ASCM threats utilizing advanced seekers while maintaining all the proven capabilities of RAM Block 0/1/1A's accurate terminal guidance, proven lethality, and no shipboard post launch dependence. Funding supports formal Developmental and Operational Testing (DT/OT) scheduled through FY 2018, data analysis, operational/test driven studies, support of combat system performance analysis and identification of operationally relevant improvements. The RAM BLK 2A Fire Control Loop Improvement Project (FCLIP) will provide software only modifications to the missile and launcher to improve raid performance. The RAM BLK 2B Raid ECP will provide an upgraded seeker and Missile-to-Missile Link (MML) capability to counter emerging complex raid threats. Development and test of RAM BLK 2B Raid ECP will occur through FY 2022.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Rolling Airframe Missile Block 2 Development and Test	17.329	41.068	26.168	0.000	26.168
Articles:	-	-	-	-	-
FY 2018 Plans: Funds completion of Integrated OT&E (Development and Operational) OT-C5 (Probability of Raid Annihilation, PRA, Testbed) testing, analysis, testbed accreditation, incorporation of any changes and associated efforts to support a FRP decision (2018). Funds continued design, integration, and test of the FCLIP combat system changes. Funds support conducting FCLIP development flight test and final verification and qualification testing as well as initial transition to production. Funding for RAM BLK 2 Raid ECP will support preliminary design work, development and delivery of prototype designs and verification testing with a PDR and MML prototype demonstration test. Funds will also support hardware procurement in FY 2018 for proof of manufacturing flight testing in FY 2020 due to long lead materials.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0167 / *5in Rolling Airframe Missile*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funds continued development of the RAM Blk 2 Raid ECP. Supports detailed design phase with continued integration testing, to include subsystem design verification testing. A CDR will be conducted in Q2 FY 2019 and the first Controlled Test Vehicle (CTV) flight test will take place in Q2 FY 2019. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in FY 2019 due reduction in RAM BLK 2B Raid ECP efforts.					
Title: Rolling Airframe Missile Block 2 Travel	0.108	0.110	0.112	0.000	0.112
Articles:	-	-	-	-	-
FY 2018 Plans: Fund program office travel to support program/testing as required by program schedule and in accordance with travel reduction mandate. ***FY 2019 Base Plans:*** Fund program office travel to support program/testing as required by program schedule and in accordance with travel reduction mandate. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY 2019 in travel supporting RAM BLK2B Raid ECP efforts.					
Accomplishments/Planned Programs Subtotals	17.437	41.178	26.280	0.000	26.280

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• WPN 2242: *RAM*	95.557	58.587	96.221	-	96.221	130.981	136.863	233.558	228.085	700.344	2,812.355
• OPN 5231: *Ship Missile Support Equipment*	8.175	7.800	16.158	-	16.158	7.464	10.072	7.195	6.835	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0167 / *5in Rolling Airframe Missile*

D. Acquisition Strategy

The RAM Program uses directed sole source contracts with Raytheon Missile Systems Company, Tucson, AZ.

E. Performance Metrics

Successfully complete DT/OT.

Achieved Initial Operational Capability (IOC) decision and support a FRP decision.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0167 / *5in Rolling Airframe Missile*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 2 Upgrade	C/CPAF	Various : Various	154.650	0.000		0.000		0.000		-		0.000	0.000	154.650	-
Primary Hardware Dev/Blk 1	Various	Various : Various	10.081	0.000		0.000		0.000		-		0.000	0.000	10.081	-
FCLIP	WR	PHD : CA	0.193	0.000		0.000		0.000		-		0.000	0.000	0.193	-
FCLIP	SS/CPFF	AECOM : VA	0.232	0.274	Feb 2017	0.543	Feb 2018	0.257	Dec 2018	-		0.257	0.000	1.306	-
Raid ECP	SS/CPFF	Raytheon : Tucson/ Louisville	9.969	5.032	Feb 2017	25.394	Oct 2017	18.574	Dec 2018	-		18.574	0.000	58.969	-
FCLIP	SS/CPFF	Raytheon : Tucson/ Louisville	21.791	10.950	Nov 2016	8.130	Jan 2018	5.392	Dec 2018	-		5.392	0.000	46.263	-
Raid ECP	SS/CPFF	JHU/APL : MD	0.000	0.450	Dec 2016	0.103	Feb 2018	0.050	Dec 2018	-		0.050	0.000	0.603	-
FCLIP	WR	China Lake : CA	1.710	0.000		0.927	Jan 2018	0.480	Nov 2018	-		0.480	0.000	3.117	-
Raid ECP	WR	China Lake : CA	0.000	0.245	Jan 2017	0.497	Jan 2018	0.380	Nov 2018	-		0.380	0.000	1.122	-
FCLIP	SS/CPFF	JHU/APL : MD	0.236	0.000		0.202	Feb 2018	0.100	Dec 2018	-		0.100	0.000	0.538	-
Raid ECP	WR	PHD : CA	0.000	0.050	Feb 2017	0.000		0.000		-		0.000	0.000	0.050	-
Raid ECP	SS/CPFF	AECOM : VA	0.000	0.126	Feb 2017	0.373	Feb 2018	0.378	Dec 2018	-		0.378	0.000	0.877	-
Raid ECP	SS/FFP	Raytheon : Tucson	0.000	0.000		4.000	Mar 2018	0.000		-		0.000	0.000	4.000	-
		Subtotal	198.862	17.127		40.169		25.611		-		25.611	0.000	281.769	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies and Analysis	Various	Various : Various	1.210	0.000		0.000		0.000		-		0.000	0.000	1.210	-
		Subtotal	1.210	0.000		0.000		0.000		-		0.000	0.000	1.210	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 0167 / *5in Rolling Airframe Missile*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Support	C/CPFF	Raytheon : Tucson	17.136	0.202	Nov 2016	0.549	Nov 2017	0.300	Nov 2018	-		0.300	0.000	18.187	-
Test Support	WR	China Lake/PHD : CA/CA	12.400	0.000		0.200	Oct 2017	0.157	Oct 2018	-		0.157	Continuing	Continuing	Continuing
FOT&E	WR	China Lake : PHD, CA	4.701	0.000		0.000		0.000		-		0.000	0.000	4.701	-
Miscellaneous	Various	Various : Various	5.765	0.000		0.000		0.000		-		0.000	0.000	5.765	-
Test Support	SS/CPFF	JHU/APL : MD	0.467	0.000		0.150	Nov 2017	0.100	Nov 2018	-		0.100	0.000	0.717	-
		Subtotal	40.469	0.202		0.899		0.557		-		0.557	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Allot	Program Office : VA	1.504	0.108	Oct 2016	0.110	Oct 2017	0.112	Oct 2018	-		0.112	Continuing	Continuing	Continuing
Defense Acquisition Workforce Development Fund	Various	various : various	0.147	0.000		0.000		0.000		-		0.000	0.000	0.147	-
		Subtotal	1.651	0.108		0.110		0.112		-		0.112	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	242.192	17.437		41.178		26.280		-		26.280	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0167 / *5in Rolling Airframe Missile*

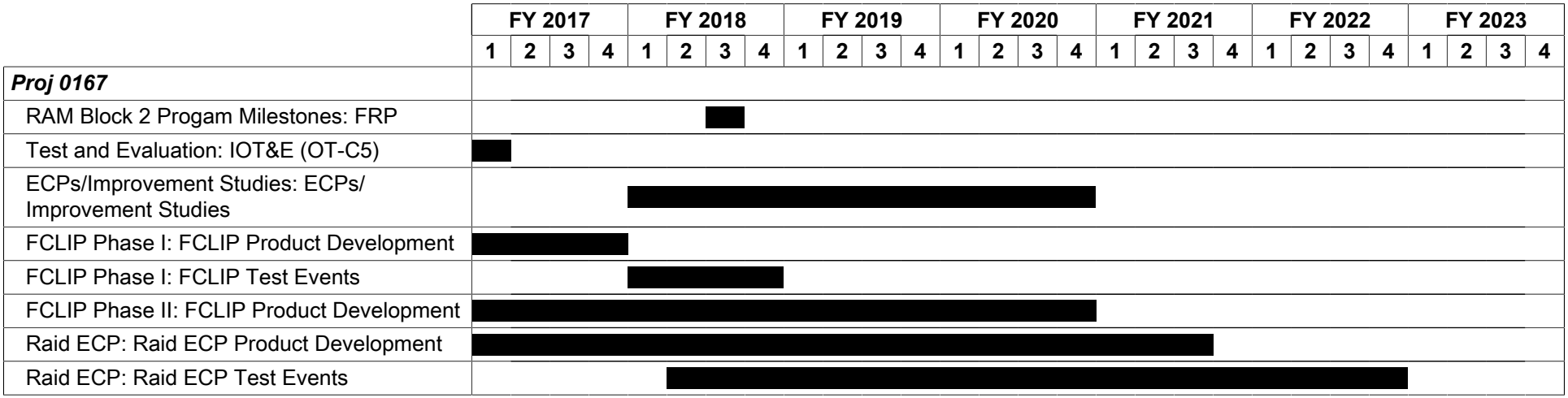


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0167 / *5in Rolling Airframe Missile*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0167				
RAM Block 2 Progam Milestones: FRP	3	2018	3	2018
Test and Evaluation: IOT&E (OT-C5)	1	2017	1	2017
ECPs/Improvement Studies: ECPs/Improvement Studies	1	2018	4	2020
FCLIP Phase I: FCLIP Product Development	1	2017	4	2017
FCLIP Phase I: FCLIP Test Events	1	2018	4	2018
FCLIP Phase II: FCLIP Product Development	1	2017	4	2020
Raid ECP: Raid ECP Product Development	1	2017	3	2021
Raid ECP: Raid ECP Test Events	2	2018	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 0173 / *NATO Sea Sparrow*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0173: *NATO Sea Sparrow*	585.311	86.868	134.205	97.694	-	97.694	88.873	79.293	81.011	47.958	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project encompasses five (5) primary efforts to enhance ship self-defense:

1. Evolved SEASPARROW Missile (ESSM) Blk 1 is a cooperative effort among 10 NATO SEASPARROW Nations and the U.S. to provide crucial defense battlespace and fire power against the fast, low altitude, highly maneuverable Anti-Ship Cruise Missile (ASCM) threat. Modifications were made to both the MK 41 Vertical Launch System (VLS) to fire from a single cell with 4 ESSM (QuadPack) and the NATO SEASPARROW Surface Missile System (NSSMS), fielding ESSM Blk 1 onboard CVN 68, LHD 1, LHA 7, CG 47, and DDG 51 class ships. ESSM Blk 1 integration efforts continue to bring the capability to CVN 78 and DDG 1000. Testing scheduled for FY18 includes ESSM Blk 1 firings from the Self Defense Test Ship in support of DDG 1000 class integration, AEGIS B/L 9C2 live fire testing, and Combat Systems Ship Qualification Trials live fire tests aboard CVN 72 and LHD 2.

2. NATO SEASPARROW Technical Direction Agent (TDA) - TDA support for the NSSMS Mk 57 Mods 12-15 which is integrated with the Ship Self Defense System (SSDS) Mk 2 to provide ship missile defense utilizing an open architected design on all CVN, LHA, and LHD class ships. A Missile Launcher Upgrade (MLU) is scheduled for Mk 57 platforms making each upgraded ship ESSM Blk 1 and ESSM Blk 2 capable.

3. ESSM Blk 2 Risk Reduction/ESSM Blk 2 Engineering and Manufacturing Development (EMD):
ESSM Blk 2 upgrade is a cooperative effort between U.S Navy and NATO SEASPARROW Consortium Nations. ESSM Blk 2 upgrade replaces the largely obsolete guidance section with a dual mode Active/Semi-Active X-Band seeker capable of defeating future threat capabilities within the existing envelope, including; smaller signatures, increased raid sizes, and adverse environments including countermeasures. Threat types include: advanced ASCMs, Anti-Ship Ballistic Missiles, surface and asymmetrical. The U.S. RDT&E funding accounts for 40% of the overall ESSM Blk 2 Development Program. Year-to-year fluctuations in funding levels are due to the variations in contributions provided by the other Nations. Through FY17, the US has funded approximately 25% of the total effort, driving the US portion of the EMD annual cost to 79% from FY18 - FY20.

4. Dual-Band Transceiver (DBT). The ESSM Blk 2 missile will utilize a DBT for in-flight data communications. This two-way datalink enables control and management of the missile during flight. This DBT leverages the new DDG 1000 / CVN 78 X-Band Transceiver to incorporate the functions to support S-Band Aegis data link (i.e. a Dual Band Transceiver). This resolves S-band obsolescence issues and provides a common transceiver across the ESSM inventory.

5. Transition to Production (TTP). Transition to Production execution ensures the design (Hardware, Software, Test Equipment, Production Tooling, etc.), defined during the E&MD Phase is successfully transitioned out of the engineering environment into a stable and capable production/manufacturing environment. During the early phase of Block 1 production the program experienced a series of 'process control failures' and 'production stoppages' leading to a "Blue Team" assessment and findings. One of the key underlying conditions identified as contributing to the discrepancies above was "incomplete transition to production activities and inadequate systems

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0173 / *NATO Sea Sparrow*

engineering." The Block 2 TTP phase of program execution exists to address the shortfalls identified in the "Blue Team" report and to ensure the requisite resources are in place to support the program as design activities end and Low Rate Initial Production(LRIP) begins to deliver missiles at a rate commensurate with the requirements of LRIP and Full Rate Production (FRP).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Evolved Sea Sparrow Missile (ESSM) testing	2.880	5.000	11.224	0.000	11.224
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct Waterfront Integration Testing and begin ESSM Joint Universal Weapons Link (JUWL) live fire testing on SDTS using Zumwalt combat system. Begin flight testing on the Self Defense Test Ship supporting DDG 1000 and CVN 78 combat systems and participate in the planning of the ship's Combat System Ship Qualification Trials (CSSQT) for DDG 1000 and CVN 78. Begin Waterfront Integration Testing with Aegis Advanced Capability Build (ACB) 16 and conduct flight tests. Conduct live fire event during LHD 2 and CVN-72 CSSQT. The program is expected to support waterfront integration testing (WIT) events for DDG1000 and CVN78 on the self-defense test ship (SDTS), as well as 24 firings for DDG1000 and 1 for CVN78 (both from the SDTS), and 2 additional combat system ship qualification tests (CSSQTs). However, FY18 funding levels do not support the full test regime. The program estimates it is short roughly $1.3M for DDG1000 support in FY18. ***FY 2019 Base Plans:*** Conduct CVN 78 Waterfront Integration Tests on lead ship and participate in CSSQT. Continue supporting Aegis ACB 16 live fire testing. Participate in the planning and execution of ZUMWALT CSSQT. Continue operational flight tests for DDG 1000 and CVN 78 combat systems on SDTS and lead ship. The program is expected to support WIT events on DDG1000 and CVN78, as well as 4 firings from DDG 1000, 20 firings from CVN78, 6 additional CSSQTS, and development of the AEGIS and CVN test beds. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY 2019 due to IWS 12.0 supporting WIT events on DDG1000 and CVN78, as well as 4 firings from DDG 1000, 20 firings from CVN78, 6 additional CSSQTS, and development of the AEGIS and CVN test beds.					
Title: NATO Sea Sparrow Combat System Integraton Technical Direction Agent (TDA)	0.304	0.313	0.323	0.000	0.323

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0173 / *NATO Sea Sparrow*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
FY 2018 Plans: In general terms, in the TDA will continue to provide expertise in reviewing and, where authorized by NATO SEASPARROW Program Office (NSPO), independently assessing and analyzing requirements, assessing upgrade options, evaluating requirements compliance, and deriving delta qualification testing/analysis requirements. In FY18, further efforts are expected in the area of radar improvements study and analysis, engineering support and risk mitigation planning associated with FCLIP efforts, Mk 9 improvements, and SSDS related upgrades linked to SSDS Advanced Capability Build (ACB) 20.					
FY 2019 Base Plans: In general terms, in the TDA will continue to provide expertise in reviewing and, where authorized by NATO SEASPARROW Program Office (NSPO), independently assessing and analyzing requirements, assessing upgrade options, evaluating requirements compliance, and deriving delta qualification testing/analysis requirements. In FY19, further efforts are expected in the area of radar improvements study and analysis, engineering support and risk mitigation planning associated with FCLIP efforts, Mk 9 improvements, and SSDS related upgrades linked to SSDS ACB20.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to continued support providing expertise in reviewing, assessing, and analyzing requirements					
Title: Evolved Sea Sparrow Missile (ESSM) Blk 2 EMD	82.624	103.506	57.614	0.000	57.614
Articles:	-	-	-	-	-
FY 2018 Plans: Through FY17, the US has funded approximately 25% of the total effort, driving the US portion of the EMD annual cost to 79% from FY18 - FY20. Continue maturing the ESSM Block 2 design during the EMD phase of the program focusing on S/W and H/W development. Complete GTVs flight test; Execute Milestone C review; Complete Development Testing (DT) Tactical S/W Build; Prepare for DT and Operational Flight to include build-					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0173 / *NATO Sea Sparrow*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
up of DT flight-test rounds, continue Transition to Production (TTP) efforts, prepare for Functional Configuration Audit. ***FY 2019 Base Plans:*** Continue maturing the ESSM Block 2 design during the EMD phase of the program focusing on S/W and H/W development. Conduct DT flight testing. Prepare for Operational Flight to include build-up of OT flight-test rounds, continue Transition to Production (TTP) efforts, prepare for Functional Configuration Audit. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $45.892 due to funding in FY2018 increasing the US contribution to obtain ESSM Blk 2 40% MOU.					
Title: I-Stalker	0.000	2.999	3.626	0.000	3.626
Articles:	-	-	-	-	-
Description: Improved Stalker (I-Stalker) will provide incremental improvements to the currently fielded Stalker Long Range Electro-Optic Sensor System (SLREOSS) in response to a 2016 United States Fleet Forces Command (USFFC) Operational Needs Statement (ONS). SLREOSS was developed as a modular, portable, form/fit replacement for the NATO Sea Sparrow Missile System (NSSMS) MK 6 Low Light Level Television (LLLTV) in response to the 2010 Naval Forces Central Command (NAVCENT) Counter Swarm Urgent Operational Need (UON) to combat Fast Attack Craft/Fast Inshore Attack Craft (FAC/FIAC). It is currently being fielded in either the NSSMS MK6 MOD 3 LLLTV Director Mount configuration or NSSMS MK6 MOD 4 LLLTV Independent Mount configuration depending on platform specifications. I-Stalker will provide required upgrades to the SLREOSS Independent Mount configuration with the enhanced capabilities provided by the Navy owned Situational Awareness System (SAwS) to deliver an integrated radar and electro-optic/Infrared control and display suite. ***FY 2018 Plans:*** Initiate design and development of SAwS integration with Stalker (I-Stalker). - Initiate final design based on GHWB I-Stalker experimental efforts. - Initiate hardware fabrication of Engineering development Model (EDM). - Initiate software updates and perform design verification testing. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0173 / *NATO Sea Sparrow*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Complete final I-Stalker design - Complete hardware fabrication of EDM - Complete software updates and execute performance/qualification testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $0.627M increase in FY 2019 is due to performance / qualification testing, systems engineering and services.					
Title: Dual Band Transceiver (DBT) ***Articles:*** ***FY 2018 Plans:*** Complete DBT TTP activities; execute Design Verification Test (DVT) and support Safety related reviews Weapon Systems Explosive Safety Review (WSESRB) and Software System Safety Technical Review Panel (SSSTRP); analyze S-Band and X-Band test results; ; complete qualification events leading to ESSM Block 1 Class 1 ECP inputs for LOT F. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to Dual Band Transceiver completion in FY 2018.	1.060 -	1.799 -	0.000 -	0.000 -	0.000 -
Title: Transition to Production (TTP) ***Articles:*** ***FY 2018 Plans:*** To mitigate schedule risk during TTP contract negotiations, Raytheon has went out on a Contract Financial Risk (CFR) in supporting artifacts and activities associated with Production Readiness Review (PRR) in preparation for Milestone C and Presidio Generation 2 Block 15 Test Equipment (TE) procurement. Prior to the PRR supporting Milestone C event in June 2018, TTP plans to host the PRR pre-briefs with PRR panel members and Technical Review Team (TRT) member at NSPO. These briefs are to close out RFIs/RFAs from the previous	0.000 -	20.588 -	24.907 -	0.000 -	24.907 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0173 / *NATO Sea Sparrow*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
PRRs, outline the PRR artifacts and entry/exit criteria's, and provide plan and progress towards Milestone C for granting approval to proceed to Low-Rate Initial Production (LRIP). The major events for TTP in Fiscal Year 2018 are the PRR supporting Milestone C, Milestone C Production decision review, and LRIP 1 contract award. ***FY 2019 Base Plans:*** After the completion of the Milestone C production decision, TTP will be preparing for the LRIP activities associated with Test Equipment (TE) procurement, prove-in, and integration. As the program transitions from E&MD to Production, work is expected to shift from Proof of Manufacturing (POM) suppliers to production (Low-Rate Initial Production (LRIP)/ Full-Rate Production (FRP)) suppliers according to the workshare plan to support production work share requirements. To support workshare requirements, an incremental PRR (iPRR) session will be conducted to evaluate low-rate readiness in light of production start-up with new suppliers. LRIP 2 contract award is scheduled for November 2018. The major events for TTP in FY19 are the LRIP 2 contract award and iPRR supporting FRP PRR. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $4.319M supports preparation for LRIP activities associated with Test Equipment (TE) procurement, prove-in, and integration.					
Accomplishments/Planned Programs Subtotals	86.868	134.205	97.694	0.000	97.694

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• WPN 2307: *ESSM*	105.279	76.292	98.384	-	98.384	128.059	217.523	293.594	530.565	Continuing	Continuing
• OPN 5231: *Ship Missile Defense*	33.897	50.606	38.518	-	38.518	29.985	30.598	31.206	31.845	Continuing	Continuing
• OMN 1D4D: *NATO Seasparrow*	17.838	30.704	37.031	-	37.031	19.543	20.129	20.489	20.962	0.000	166.696

Remarks

Stalker program also funded by OPN.
OPN funding for Stalker is captured above in LI 5231 - Ship Missile Defense line as follows: FY18: $5.668M, FY19: $10.598M.
OPN funding for IWS 12.0 is captured above in LI 5231- Ship Missile Defense line as follows: FY18: $44.938M, FY19: $27.920M, FY20: $29.985M, FY21: $30.598M, FY22: $31.206M, FY23: $31.845M
OMN funding for Stalker is captured above in LI 1D4D - NATO Seasparrow line as follows: FY18: $1.801M, FY19: $3.469M

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0173 / *NATO Sea Sparrow*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
OMN funding is for ESSM Blk 1, ESSM Blk 2, NSSMS, & RIM-7											

D. Acquisition Strategy

ESSM Blk 2 EMD is a directed sole source contract to Raytheon Missile Systems Company.

I-Stalker: NSWC Crane to initiate and complete final design of hardware/software for integration of SAwS w/Stalker in preparation for sole source procurement (OPN) of Stalker Kits from the current design agent (Ball Aerospace) and SAwS Kits from NSWC Crane to meet CVN and LHD/LHA fleet deployment schedules.

E. Performance Metrics

Successfully conduct Developmental Testing/Operational Testing. Two ESSM Blk 2 Controlled Test Vehicle flight tests were successfully conducted in June 2017 onboard the Self Defense Test Ship at the Point Mugu Sea Range. Three subsequent Guided Test Vehicle flight tests are scheduled in FY 2018. The ESSM Blk 2 Milestone C decision is scheduled for Q4 FY 2018 with Initial Operational Capability for AEGIS platforms scheduled for 2020 and SSDS platforms in 2023. ESSM Blk 2 Low Rate Initial Production deliveries are expected to begin in 2020 with Full Rate Production rounds delivering to the Fleet in 2023.

I-Stalker: Initiate and complete final design, successful performance/qualification testing and delivery of EDM.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 0173 / *NATO Sea Sparrow*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ESSM Systems Engineering/Firing Spt	WR	Corona : CA	9.692	0.705	Dec 2016	0.705	Oct 2017	0.705	Nov 2018	-		0.705	0.000	11.807	-
NATO OC System Engineering	C/ FFPLOE	Raytheon : RI	1.955	0.000		0.000		0.000		-		0.000	0.000	1.955	-
NATO OC - Software	C/ FFPLOE	Raytheon : RI	8.054	0.000		0.000		0.000		-		0.000	0.000	8.054	-
Stalker System Engineering	WR	NSWC Crane : IN	4.782	0.000		0.000		0.000		-		0.000	0.000	4.782	-
Stalker Hardware Engineering	WR	NSWC Crane : IN	14.350	0.000		0.000		0.000		-		0.000	0.000	14.350	-
Stalker Software Engineering	WR	NSWC Crane : IN	2.725	0.000		0.000		0.000		-		0.000	0.000	2.725	-
ESSM Primary Hardware Development	C/CPAF	Raytheon : Tuscon	193.941	0.000		0.000		0.000		-		0.000	0.000	193.941	-
ESSM Ancillary Hardware	Various	Various : Various	71.324	0.000		0.000		0.000		-		0.000	0.000	71.324	-
ESSM Blk 2 EMD	C/CPIF	Raytheon : Tuscon	90.599	70.255	Jul 2017	90.767	Oct 2017	44.413	Oct 2018	-		44.413	0.000	296.034	-
I-Stalker Systems Engineering	WR	NSWC Crane : Crane, IN	0.000	0.000		0.989	Feb 2018	1.240	Nov 2018	-		1.240	0.000	2.229	-
TTP	C/BA	Raytheon : Tuscon	0.000	0.000		20.588	Oct 2017	24.907	Oct 2018	-		24.907	0.000	45.495	-
ESSM Blk 2 Risk reduction	SS/ FFPLOE	Raytheon : Tuscon	44.150	0.000		0.000		0.000		-		0.000	0.000	44.150	-
NATO OC Systems Engineering SPT	WR	NSWC PHD : CA	0.700	0.000		0.000		0.000		-		0.000	0.000	0.700	-
Dual Band Tranceiver	SS/FFP	Raytheon : Tuscon	4.496	0.460	Jul 2017	1.199	Oct 2017	0.000		-		0.000	0.000	6.155	-
		Subtotal	446.768	71.420		114.248		71.265		-		71.265	0.000	703.701	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NATO System TDA	SS/FP	APL : MD	2.485	0.304	Dec 2016	0.313	Nov 2017	0.323	Nov 2018	-		0.323	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 0173 / *NATO Sea Sparrow*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NATO OC	SS/FFP	APL : MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Stalker -ISEA/TDA/RM&A	SS/FFP	various : various	0.750	0.000		0.000		0.000		-		0.000	0.000	0.750	-
ILS/Engineering Support	Various	Various : Various	15.543	0.000		0.000		0.000		-		0.000	0.000	15.543	-
ESSM Blk 2 EMD	WR	APL : MD	7.856	4.095	Dec 2016	4.218	Oct 2017	4.285	Oct 2018	-		4.285	0.000	20.454	-
ESSM Blk 2 EMD	WR	NAWC CL : CA	9.462	5.742	Dec 2016	5.914	Nov 2017	6.197	Nov 2018	-		6.197	0.000	27.315	-
ESSM Blk 2 EMD	Various	Various : Various	3.727	2.532	Jan 2017	2.607	Nov 2017	2.715	Nov 2018	-		2.715	0.000	11.581	-
I-Stalker Platform Integration	WR	Norfolk Naval Shipyard (NNSY) : Norfolk, VA	0.000	0.000		0.900	Nov 2017	0.600	Nov 2018	-		0.600	0.000	1.500	-
I-Stalker Platform Integration	C/BA	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		0.675	Nov 2017	0.450	Nov 2018	-		0.450	0.000	1.125	-
I-Stalker Platform Integration	C/BA	NSWC Crane : Crane, IN	0.000	0.000		0.315	Nov 2017	0.705	Nov 2018	-		0.705	0.000	1.020	-
NATO OC Support	WR	Dahlgren : VA	2.174	0.000		0.000		0.000		-		0.000	0.000	2.174	-
Dual Band Transceiver	WR	APL : MD	0.400	0.200	Dec 2016	0.200	Dec 2017	0.000		-		0.000	0.000	0.800	-
Dual Band Tranceiver	WR	NAWC CL : CA	0.800	0.400	Dec 2016	0.400	Dec 2017	0.000		-		0.000	0.000	1.600	-
		Subtotal	43.197	13.273		15.542		15.275		-		15.275	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ESSM Developmental Test & Evaluation	WR	NAWC CL : CA	21.845	0.202	Jan 2017	0.204	Oct 2017	0.250	Oct 2018	-		0.250	Continuing	Continuing	Continuing
ESSM OPEVAL/ TECHEVAL/Test Firings	WR	Corona, IHD, Dahlgren, SNSWC, PHD) : various	18.118	0.285	Jan 2017	0.285	Nov 2017	2.951	Nov 2018	-		2.951	0.000	21.639	-
ESSM Developmental Test & Evaluation	SS/FFP	APL : MD	5.782	0.100	Dec 2016	0.100	Oct 2017	0.500	Oct 2018	-		0.500	Continuing	Continuing	Continuing
ESSM Test & Evaluation	C/CPAF	Raytheon : Tuscon	18.917	1.000	Jun 2017	3.118	Nov 2017	3.364	Nov 2018	-		3.364	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 0173 / *NATO Sea Sparrow*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ESSM Test & Evaluation	WR	Dahlgren/PHD : VA/ CA	2.342	0.372	Jan 2017	0.372	Nov 2017	1.698	Nov 2018	-		1.698	0.000	4.784	-
Developmental Test & Evaluation	WR	Dahlgren : VA	0.418	0.000		0.000		0.000		-		0.000	0.000	0.418	-
I-Stalker Development Test and Evaluation	WR	NSWC Crane : IN	0.000	0.000		0.120	Feb 2018	0.431	Nov 2018	-		0.431	0.000	0.551	-
		Subtotal	67.422	1.959		4.199		9.194		-		9.194	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ESSM-Support and Performing Activity	Allot	PHD/NAWC CL/ APL : CA/MD	14.879	0.116	Oct 2016	0.116	Oct 2017	1.660	Oct 2018	-		1.660	Continuing	Continuing	Continuing
ESSM-Travel	Allot	Program Office : VA	3.327	0.100	Oct 2016	0.100	Oct 2017	0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
ESSM-Misc	Various	various : various	2.149	0.000		0.000		0.000		-		0.000	0.000	2.149	2.065
NATO Travel/Misc	Various	Program Office : various	2.111	0.000		0.000		0.000		-		0.000	0.000	2.111	-
Engineering Support	Various	Various : Various	5.458	0.000		0.000		0.000		-		0.000	0.000	5.458	-
I-Stalker Program Engr Svcs	C/CPIF	SPA : Washington, DC	0.000	0.000		0.000		0.200	Nov 2018	-		0.200	0.000	0.200	-
		Subtotal	27.924	0.216		0.216		1.960		-		1.960	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	585.311	86.868		134.205		97.694		-		97.694	Continuing	Continuing	N/A

Remarks

Various used for multiple vendors and location under threshold.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0173 / *NATO Sea Sparrow*

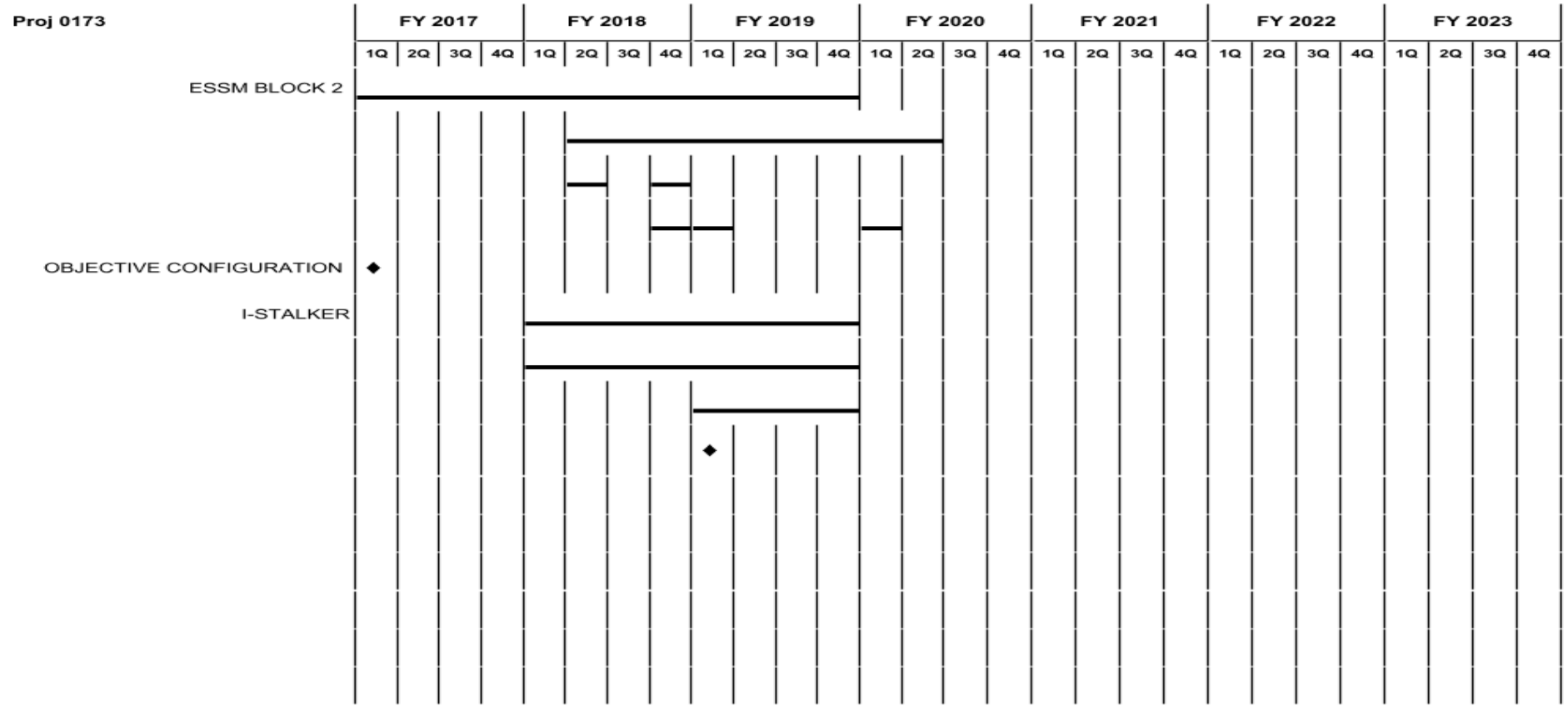


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0173 / *NATO Sea Sparrow*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0173				
ESSM BLOCK 2: Engineering and Manufacturing Development	1	2017	4	2019
ESSM BLOCK 2: Production MOU Negotiation/Signature	1	2017	4	2017
ESSM BLOCK 2: In Service Support MOU Negotiation/Signature	1	2017	3	2019
ESSM BLOCK 2: Transition to Production	2	2018	2	2020
ESSM BLOCK 2: Production Decision LRIP (Milestone C)	4	2018	4	2018
ESSM BLOCK 2: LRIP 1 Award	4	2018	4	2018
ESSM BLOCK 2: LRIP 2 Award	1	2019	1	2019
ESSM BLOCK 2: LRIP 3 Award	1	2020	1	2020
OBJECTIVE CONFIGURATION: CDR	1	2017	1	2017
I-STALKER: Transition to Production	1	2018	4	2019
I-STALKER: Final Design, Engineering, & Manufacturing Development	1	2018	4	2019
I-STALKER: Development Testing	1	2019	4	2019
I-STALKER: EDM Delivery	1	2019	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 0243 / *ALaMO*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0243: *ALaMO*	0.000	5.594	26.175	24.714	-	24.714	0.000	0.000	0.000	0.000	0.000	56.483
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The 57mm MK 332 HE-4G Projectile significantly increases MK 110 Gun Mount lethality and effectiveness against Fast Attack Craft and Fast In-Shore Attack Craft (FAC/FIAC). The 57mm ALaMO concluded development as part of a classified program and transitioned to qualification for Navy use in FY 2017. ALaMO will transition to production at the conclusion of the program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Systems Engineering and Testing	5.594	26.175	24.714	0.000	24.714
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to procure hardware for design verification and performance verification test assets. Conduct MK 332 component and projectile design verification tests. Conduct radar and divert mechanism performance verification tests from land based test sites. Measure warhead fragmentation and conduct lethality modeling. Perform safety and suitability environmental qualification tests. Conduct the test planning for hazard classification and insensitive munitions qualification. Coordinate the planning for FY 2019 land based and shipboard DT events. Begin planning Initial Operational Test & Evaluation (IOT&E) with Commander Operational Test & Evaluation Force (COMOPTEVFOR).					
FY 2019 Base Plans: Procure balance of hardware for DT assets. Conduct remaining performance verification test. Conduct hazard classification and insentitive munitions qualification. Conduct remaining safety and suitability environmental qualification tests. Build DT test assets Conduct land based and shipboard DT events. Conduct Weapons System Explosives Safety Review Board reviews for qualification closure.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0243 / *ALaMO*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct Weapons System Explosives Safety Review Board reviews for DT events. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 decrease of $1.4M due to program finalizing procurement of Development Test hardware and various verification tests at the end of its R&D development lifecycle. Program will begin to procure LRIP quantities in FY 2019 under the ICAL PANMC budget in order to meet IOC in FY 2020.					
Accomplishments/Planned Programs Subtotals	5.594	26.175	24.714	0.000	24.714

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PANMC/0266: *INTERMEDIATE CALIBER GUN AMMO HE-4G*	0.000	0.000	19.500	-	19.500	34.904	28.289	28.855	29.432	0.000	140.980

Remarks

Profile only reflects procurement of CART 57MM ALaMO (HE-4G). LRIP Procurement begins FY19 under the ICAL PANMC budget in order to meet IOC in FY20.

D. Acquisition Strategy

MK 332 HE-4G will be qualified for Navy use in FY2019.

E. Performance Metrics

Quarterly Program Reviews and semi-annual Product Certification Panel Reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 0243 / *ALaMO*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Produce Design Verification hardware, DT Hardware	MIPR	DOTC : PICATINNY ARSENAL, NJ	0.000	5.000	Mar 2017	20.444	Jan 2018	20.097	Jan 2019	-		20.097	0.000	45.541	49.300
		Subtotal	0.000	5.000		20.444		20.097		-		20.097	0.000	45.541	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Services	WR	NSWC, DD : Dahlgren, VA	0.000	0.493	Oct 2016	3.801	Oct 2017	2.965	Oct 2018	-		2.965	0.000	7.259	-
Government Engineering Services	WR	NSWC, IHEODTD : Indian Head, MD	0.000	0.101	Oct 2016	1.930	Oct 2017	1.652	Oct 2018	-		1.652	0.000	3.683	-
		Subtotal	0.000	0.594		5.731		4.617		-		4.617	0.000	10.942	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.594		26.175		24.714		-		24.714	0.000	56.483	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0243 / *ALaMO*

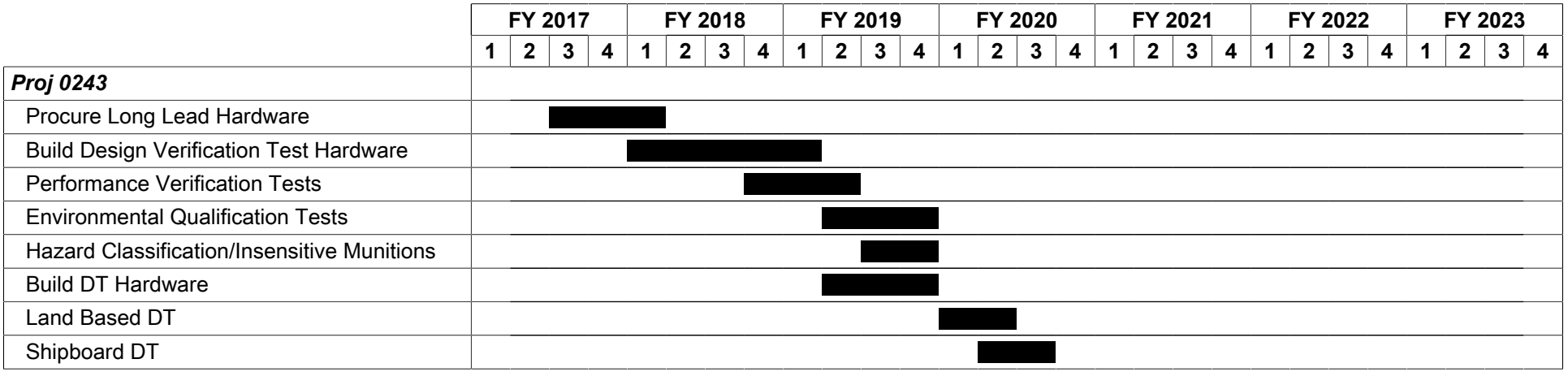


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 0243 / *ALaMO*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0243				
Procure Long Lead Hardware	3	2017	1	2018
Build Design Verification Test Hardware	1	2018	1	2019
Performance Verification Tests	4	2018	2	2019
Environmental Qualification Tests	2	2019	4	2019
Hazard Classification/Insensitive Munitions	3	2019	4	2019
Build DT Hardware	2	2019	4	2019
Land Based DT	1	2020	2	2020
Shipboard DT	2	2020	3	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 2070 / *OTH Missile*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2070: *OTH Missile*	0.000	0.000	0.000	19.968	-	19.968	28.162	26.556	11.349	8.441	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

OTH Missile funds competitive acquisition, testing, and fielding of a modern, technologically mature Over-the-Horizon Weapon System (OTH-WS) surface to surface missile capability to be installed onto commissioned and in-production Littoral Combat Ship /Frigate(LCS/FFG) beginning in FY 2021. This continues efforts begun in FY 2016 through FY 2018 Frigate PE 0603599N Project 3086. This is not a new start.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: OTH-WS Test and Evaluation and Systems Engineering	0.000	0.000	19.968	0.000	19.968
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: -Execute and initiate Over-the-Horizon Weapon System (OTH-WS) ship engineering activities, to include installation planning and design configuration on both Independence and Freedom LCS platforms. -Receive approval on OTH-WS required acquisition milestone documentation in accordance with DoD 5000.2. -Develop OTH-WS artifacts to support combat/system certifications required prior to system installation aboard LCS class ships. -Perform OTH-WS test and evaluation activities to include procurement of test assets, conduct of scenario working groups and development of firing scripts. -Initiate Test Planning Activities (Development and Operational testing (DT-OT), Environments, Electromagnetic interference (EMI) and electromagnetic compatibility (EMC), Qualifications, etc.). -Execute OTH-WS logistics requirements to include, the development of maintenance plans, inventory management conceptualization, movement of equipment and asset movement coordination, identification and coordination of ordnance					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 2070 / *OTH Missile*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
storage facilities, development of maintenance cards, and development of ordnance handling and loading procedures. -Provide overarching OTH-WS subject matter expertise to assist the program office with carrying out the surface to surface missile mission. -Begin OTH-WS Weapon System Explosives Safety Review Board (WSESRB) coordination and planning efforts (Software Systems Safety Technical Review Panel (SSSTRP), Fuse and Initiation System Technical Review Panel (FISTRP), Hazard of Electromagnetic Radiation to Ordnance (HERO), Insensitive Munitions (IM)). -Begin the Element Certification Planning, Production Engineering efforts (Ship Change document (SCD), Interface control Document (ICD) preparation, production processes and factory acceptance familiarization, cyber planning, ship interfaces/combat system familiarization). -Start Fleet training planning (Facility, Naval Training System Plan (NTSP) development). -Fund the initial Original Equipment Manufacturer (OEM) Design Agent Support. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $19.968M in FY 2019 to support planning and initial execution of new Over The Horizon Weapon System (OTH WS) capability for the Littoral Combat Ship/Frigate (LCS/FFG) platforms. This includes planning of test activities, training, and equired logistics for a missile footprint not currently in Navy inventory and program management functions. This continues efforts begun in FY 2016 - FY 2018 Frigate PE 0603599N Project 3086. This is not a new start as the funding was realigned from PE 0603599N Project 3086.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	19.968	0.000	19.968

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTEN/0603599/3086: *Frigate / OTH Missile System*	2.980	1.700	1.784	-	1.784	0.000	0.000	0.000	0.000	0.000	6.806

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 2070 / *OTH Missile*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN /5231: *Ship Missile Support Equipment/OTH Missile*	0.000	0.000	2.874	-	2.874	5.875	7.955	10.102	10.301	0.000	37.107
• WPN 2292: *LCS OTH Missile*	0.000	0.000	18.156	-	18.156	28.312	28.714	29.139	44.691	0.000	149.012

Remarks

D. Acquisition Strategy

The OTH-WS is an Acquisition Category (ACAT) II level weapon system production and sustainment program to provide the current Littoral Combat Ship (LCS) variants and Frigate (FFG) ships with an Over-the-Horizon Surface-To-Surface Missile (SSM) capability. The Navy intends to competitively select a technologically mature OTH-WS in FY 2018 and enter the Acquisition Cycle at Milestone C.

E. Performance Metrics

Performance metrics include awarding the Low Rate Initial Production (LRIP) 2 contract option for the OTH-WS, achieving a successful System Performance Verification Testing and initial Qualification Testing and Integrating training courses and materials into LCS schoolhouses. Additionally, the program office will continue installation planning and design configuration on required ship platforms (LCS/FFG), supporting combat/system certifications required prior to system installation, test planning activities to include; SSSTRP, FISTRP, Quick Reaction Assessment (QRA) and Operational Testing (OT), and the development and integration of logistics support requirements for the OTH-WS.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 2070 / *OTH Missile*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OTH All Up Round (AUR) Technical Design Agent	WR	NAWC/WD : China Lake, CA	0.000	0.000		0.000		1.366	Oct 2018	-		1.366	Continuing	Continuing	Continuing
OTH Simulation and Analysis	WR	NSWC/COR : Corona, CA	0.000	0.000		0.000		0.290	Oct 2018	-		0.290	Continuing	Continuing	Continuing
OTH Weapon System Design Agent	WR	NSWC/DD : Dahlgren, VA	0.000	0.000		0.000		0.525	Oct 2018	-		0.525	Continuing	Continuing	Continuing
OTH Test & Evaluation / ILS	WR	NSWC/PHD : Port Hueneme, CA	0.000	0.000		0.000		0.750	Oct 2018	-		0.750	Continuing	Continuing	Continuing
OTH Weapon System Safety	WR	NSWC/DD : Dahlgren, VA	0.000	0.000		0.000		0.220	Oct 2018	-		0.220	Continuing	Continuing	Continuing
OTH Contractor Engineering Support	C/CPIF	Alion/ECS/GDIT : Arlington, VA	0.000	0.000		0.000		0.635	Dec 2018	-		0.635	Continuing	Continuing	Continuing
Weapons Systems Engineering Planning	SS/CPFF	JHU/APL : Laurel, MD	0.000	0.000		0.000		0.462	Dec 2018	-		0.462	Continuing	Continuing	Continuing
OEM Engineering Support	C/CPFF	TBD : TBD	0.000	0.000		0.000		3.200	Nov 2018	-		3.200	Continuing	Continuing	Continuing
Test & Evaluation Assets	C/FFP	TBD : TBD	0.000	0.000		0.000		12.000	Nov 2018	-		12.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		19.448		-		19.448	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OTH Contractor Acquisiton Mgt Suppt	C/CPIF	CACI : Arlington, VA	0.000	0.000		0.000		0.320	Dec 2018	-		0.320	Continuing	Continuing	Continuing
OTH Program Management Support	C/CPIF	Strategic Insight : Arlington, VA	0.000	0.000		0.000		0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
OTH Program Management Support	WR	PEO IWS : Arlington, VA	0.000	0.000		0.000		0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.520		-		0.520	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 2070 / *OTH Missile*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		19.968		-		19.968	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 2070 / *OTH Missile*

Over The Horizon-Weapon System

1

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 2070 / *OTH Missile*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2070				
Request For Proposal (RFP)	2	2017	2	2017
Test Planning Activities (TEMP, Environments, EMC/EMI, Qualifications)	2	2017	3	2018
Weapon System Explosives Safety Review Board Coordination and Planning (SSSTRP, FISTRP, HERO, IM)	2	2018	2	2020
System Qualification and Test	4	2018	1	2021
Maintenance Planning (ISEA, ILSP development, ILA support)	1	2018	4	2018
Training Planning (Facility, NTSP development)	2	2018	4	2018
Production Verification Testing (PVT)	2	2019	2	2020
Major Review - Production Readiness Review	4	2020	4	2020
Operational Testing	1	2021	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 9081 / *Phalanx CIWS SEARAM*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9081: *Phalanx CIWS SEARAM*	6.798	0.346	10.854	9.882	-	9.882	18.242	17.711	22.141	22.514	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MK 15 Close-In Weapons System (CIWS) is a fast reaction, rapid fire, computer controlled radar system utilizing either a 20mm gun (Phalanx) or a SeaRAM weapon system (SeaRAM) to meet its primary mission of providing Anti-Ship Missile (ASM) defense. CIWS fleet population exceeds 220 systems onboard nearly every USN surface combatant. In addition, CIWS continues to be installed on new construction surface ships with life expectancies of 25+ years. Basic system architecture is 20+ years old, hasn't had a significant R&D development effort since the 1990's, and is in need of Technology Refresh in order to avoid hardware obsolescence, maintain/improve reliability, increase capability, and provide affordable spare parts to achieve acceptable Operational Availability for the next 20+ years. Technology Refresh development starts in FY 2018 and will be fielded during CIWS overhauls and will consist of three efforts: Electric Gun Drive System (EGDS), Electronics Enclosure Modernization (ELX), and Local Control Station and Remote Control Station (LCS/RCS) Redesign. EGDS will replace the current pneumatic gun drive system that is difficult and costly to maintain with an all-electric drive system. EGDS will reduce maintenance/troubleshooting requirements, reduce support costs, and provide capability increases such as variable firing rates and reduced ammunition expenditures. ELX replaces costly and obsolete 1970's technology circuit card assemblies, servo controllers and electronic drawer backplanes with COTS digital devices, integrated controllers, and efficient power converters. ELX also will provide a reduction in weight of approx 960 lbs and simplified maintainability. LCS/RCS Redesign eliminates expensive obsolete components, decreases maintenance requirements and complexity, increases commonality between the LCS and RCS via open architecture, and simplifies the user operation by reducing Human Machine Interface requirements.

SeaRAM CIWS is deployed onboard DDG 64, 71, 75, and 78 in order to provide additional capability to meet emerging threats. Efforts include development, qualification, and testing of software and hardware modifications in order to support fielding on these AEGIS class ships. The SeaRAM installation schedule on DDG is as follows: DDG 78 completed March 2016; DDG 64 completed July 2016; DDG 75 completed November 2016; DDG 71 completed March FY 2017.

CIWS Next Generation has been deferred to future years.

Congressional Add funds of $4.836M received in FY 2017 for CIWS Technology Refresh for Electronics Enclosure Modernization. Congressional funds added into Project 9999.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CIWS Tech Refresh	0.000	10.854	9.882	0.000	9.882
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 9081 / *Phalanx CIWS SEARAM*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Non-recurring engineering efforts for CIWS Technology Refresh Modernization activities are focused on redesign of key subsystems, some of which date to the 1970s with obsolete and largely unsupportable electronics systems. Replacing these subsystems with modular "refreshed" components will reduce total ownership costs for the overall sustainment of the Phalanx system and provide a significant capability increase. - Electric Gun Drive System ***FY 2019 Base Plans:*** Continue CIWS Technology Refresh efforts for the Electric Gun Drive System. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Budget decrease from FY 2018 to FY 2019 is due to the rephrasing of CIWS Technology Refresh Modernization efforts.					
Title: SeaRAM on DDG Class ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A	0.346 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	0.346	10.854	9.882	0.000	9.882

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The MK 15 Close-In Weapons System (CIWS) is a fast reaction, rapid fire, computer controlled radar system utilizing either a 20mm gun (Phalanx) or a SeaRAM weapon system (SeaRAM) to meet its primary mission of providing Anti-Ship Missile (ASM) defense. Funding provides support for efforts related to Technology Refresh

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 9081 / *Phalanx CIWS SEARAM*

(for current fleet population) as well as efforts related to the integration/installation of SeaRAM CIWS in DDG 64, 71, 75, and 78. This work will be completed via sole source contracts to the CIWS Design Agent (Raytheon Missile Systems). Tech Refresh improvements will be fielded as Engineering Change Proposals (ECPs) and will be installed during CIWS overhauls or pierside.

E. Performance Metrics

Successfully complete trade studies and initial requirements definition for Technology Refresh and efforts related to successful integration/installation of SeaRAM CIWS in DDG class ships.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 9081 / *Phalanx CIWS SEARAM*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CIWS Tech Refresh	SS/CPFF	Raytheon Missile Systems : Tucson, AZ	4.435	0.000		0.000		0.000		-		0.000	0.000	4.435	4.435
SeaRAM CIWS on DDG Class	SS/CPFF	Raytheon Missile Systems: : Various	1.963	0.346	Mar 2017	0.000		0.000		-		0.000	0.000	2.309	-
CIWS Tech Refresh	Various	Various : Various	0.400	0.000		10.854	Apr 2018	9.882	Jan 2019	-		9.882	Continuing	Continuing	Continuing
		Subtotal	6.798	0.346		10.854		9.882		-		9.882	Continuing	Continuing	N/A

Remarks

CIWS Tech Refresh modernization activities are focused on redesign of key subsystems, some of which date to the 1970s with obsolete and largely unsupportable electronics systems. Replacing these subsystems with modular "refreshed" components will reduce total ownership costs and maintenance requirements for the overall sustainment of the Phalanx system.

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.798	0.346		10.854		9.882		-		9.882	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 9081 / *Phalanx CIWS SEARAM*

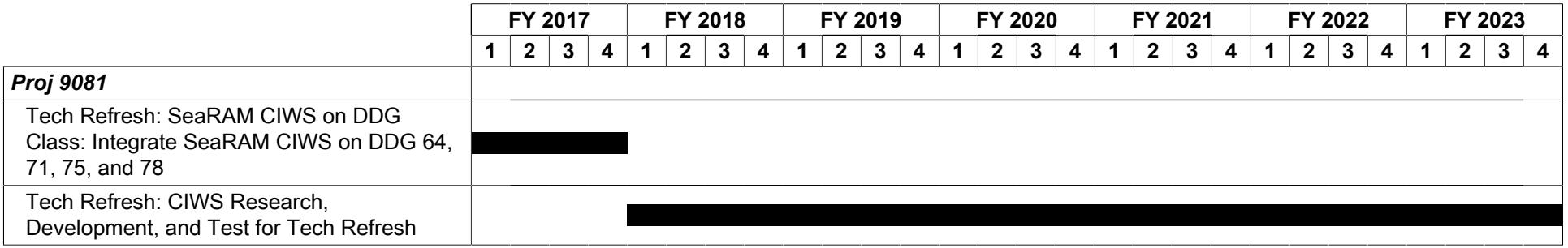


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 9081 / *Phalanx CIWS SEARAM*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9081				
Tech Refresh: SeaRAM CIWS on DDG Class: Integrate SeaRAM CIWS on DDG 64, 71, 75, and 78	1	2017	4	2017
Tech Refresh: CIWS Research, Development, and Test for Tech Refresh	1	2018	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	3.072	4.836	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.908
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MK 15 Close-In Weapons System (CIWS) is a fast reaction, rapid fire, computer controlled radar system utilizing either a 20mm gun (Phalanx) or a SeaRAM weapon system (SeaRAM) to meet its primary mission of providing Anti-Ship Missile (ASM) defense. CIWS fleet population exceeds 220 systems onboard nearly every USN surface combatant. In addition, CIWS continues to be installed on new construction surface ships with life expectancies of 25+ years. Basic system architecture is 20+ years old, hasn't had a significant R&D development effort since the 1990's, and is in need of Technology Refresh in order to avoid hardware obsolescence, maintain/improve reliability, increase capability, and provide affordable spare parts to achieve acceptable Operational Availability for the next 20+ years. Technology Refresh development starts in FY 2018 under Project 9081 and will be fielded during CIWS overhauls and will consist of three efforts: Electric Gun Drive System (EGDS), Electronics Enclosure Modernization (ELX), and Local Control Station and Remote Control Station (LCS/RCS) Redesign. EGDS will replace the current pneumatic gun drive system that is difficult and costly to maintain with an all-electric drive system. EGDS will reduce maintenance/troubleshooting requirements, reduce support costs, and provide capability increases such as variable firing rates and reduced ammunition expenditures. ELX replaces costly and obsolete 1970's technology circuit card assemblies, servo controllers and electronic drawer backplanes with COTS digital devices, integrated controllers, and efficient power converters. ELX also will provide a reduction in weight of approx 960 lbs and simplified maintainability. LCS/RCS Redesign eliminates expensive obsolete components, decreases maintenance requirements and complexity, increases commonality between the LCS and RCS via open architecture, and simplifies the user operation by reducing Human Machine Interface requirements.

Congressional funds of $4.836M received in FY17 for CIWS Tech Refresh for Electronics Enclosure Modernization

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Electronics Enclosure Redesign Efforts	4.836	0.000
FY 2017 Accomplishments: Kick off CIWS Tech Refresh efforts for Electronics Enclosure Modernization		
FY 2018 Plans: Conduct trade studies and requirements generation which will culminate in Systems Requirements Review.		
Congressional Adds Subtotals	4.836	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 9999 / *Congressional Adds*

D. Acquisition Strategy

The MK 15 Close-In Weapons System (CIWS) is a fast reaction, rapid fire, computer controlled radar system utilizing either a 20mm gun (Phalanx) or a SeaRAM weapon system (SeaRAM) to meet its primary mission of providing Anti-Ship Missile (ASM) defense. Funding provides support for efforts related to Technology Refresh (for current fleet population) as well as efforts related to the integration/installation of SeaRAM CIWS in DDG 64, 71, 75, and 78. This work will be completed via sole source contracts to the CIWS Design Agent (Raytheon Missile Systems). Tech Refresh improvements will be fielded as Engineering Change Proposals (ECPs) and will be installed during CIWS overhauls or pierside.

E. Performance Metrics

Successfully complete trade studies and initial requirements definition for Technology Refresh and efforts related to successful integration/installation of SeaRAM CIWS in DDG class ships.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CIWS Electronics Enclosure Redesign	SS/CPFF	Raytheon Missile Systems : Tucson, AZ	3.072	4.836	Aug 2017	0.000		0.000		-		0.000	0.000	7.908	-
		Subtotal	3.072	4.836		0.000		0.000		-		0.000	0.000	7.908	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.072	4.836		0.000		0.000		-		0.000	0.000	7.908	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 9999 / *Congressional Adds*

	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Proj 9999																												
CIWS Tech Refresh: CIWS Research, Development, and Test for Tech Refresh					[redacted]																							

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604756N / *Ship Self Def (Engage: Hard Kill)*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
CIWS Tech Refresh: CIWS Research, Development, and Test for Tech Refresh	4	2017	2	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604757N *I Ship Self Def (Engage: Soft Kill/EW)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,250.077	108.630	103.391	120.507	-	120.507	97.029	71.110	41.758	43.045	Continuing	Continuing
0954: *Shipboard EW Improvement Program*	484.685	10.690	16.013	15.835	-	15.835	16.026	16.393	16.673	17.013	Continuing	Continuing
2190: *NULKA Decoy*	65.537	1.925	4.181	3.975	-	3.975	5.234	5.384	7.509	7.683	Continuing	Continuing
3227: *SEWIP Block 2*	222.848	0.303	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	223.151
3316: *Advanced Offboard EW*	125.853	27.540	45.867	64.796	-	64.796	54.073	26.105	10.561	10.983	Continuing	Continuing
3321: *SEWIP Block 3*	351.154	68.172	37.330	35.901	-	35.901	21.696	23.228	7.015	7.366	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $0.357 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

0954 - The Surface Electronic Warfare Improvement Program (SEWIP) is segmented into Block 1A, Block 1B, Block 2, Block 3, and Soft Kill Coordination System (SKCS). Block 1A upgraded the AN/SLQ-32 pulse-processing computers and the display consoles allowing the system to more quickly identify threats and better display the information to the operator. Block 1B added adjunct sensors for special signal intercept, including Specific Emitter Identification (SEI), and High Gain High Sensitivity (HGHS) (Block 1B3), a critical improvement for the threat correlation, situational awareness, and extending the battle space. Block 2 enhanced Surface Electronic Warfare (EW) and provided improved Anti-Ship Missile Defense (ASMD) and situational awareness through an improved Electronic Support (ES) receiver, antenna, and combat system interface. The addition of Block 2 to Block 1B3 forms the AN/SLQ-32 (V)6. Block 3 will provide an enhanced electronic attack capability to improve ASMD and counter-targeting. The addition of Block 3 to AN/SLQ-32 (V)6 forms the AN/SLQ-32(V)7 system. EW Rapid Capability Insertion Process (RCIP) identifies system and mission capability gaps by analyzing EW baseline and fleet requirements, prioritizes those gaps based on fleet input and critical technology maturity, and develops upgrades to the AN/SLQ-32(V) product line to address those gaps. The SKCS will provide SK weapon coordination and enhanced situational awareness to the AN/SLQ-32 (V)6 with EW/radar track association to support SK engagement decisions, including Radar Cued Engagements (RCE) and Electronic Attack (EA) with both onboard EA, provided by AN/SLQ-32 (V)7, and off-board EA. RCIP also integrates Future Naval Capability (FNC) programs into SEWIP.

2190 - The Offboard Active Decoy (NULKA) is a joint cooperative program between the United States and Australia that developed an active offboard decoy that utilizes a broadband radio frequency repeater mounted atop a hovering rocket. NULKA is designed to counter a wide variety of present and future radar guided Anti-Ship Missiles (ASMs) by radiating a large radar cross section while flying a ship-like trajectory. The United States developed the electronic payload and fire control system, while Australia developed the hovering rocket. Future efforts involve development of the capability for high value unit protection. Increased funding beginning in FY18 is required for DLP technology refresh to address obsolescence issues.

3227 - SEWIP Block 2 is developing an upgraded antenna, receiver, and combat system interface for AN/SLQ-32. The upgrades are necessary in order to pace the threat, improving detection, accuracy, and mitigation of Electromagnetic Interference (EMI).

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604757N *I Ship Self Def (Engage: Soft Kill/EW)*

3316 - The Advanced Offboard EW (AOEW) program is for the development of long duration off-board decoys integrated with onboard systems for EW coordination to counter identified EW gaps (additional details classified) in response to an urgent operational need from the Fleet that has been approved by the CNO for execution. Currently no counter to the threat exists. In FY12, the program began with a Rapid Response Effort (RRE) and a Decoy Development Effort (DDE) RRE development was completed in FY14. The RRE consisted of the evaluation and integration of commercially available decoys. The DDE consists of the development and evaluation of a long duration, active electronic offboard decoy system (payload) integrated on an existing flight vehicle (MH-60R/MH-60S), integration with ship and air systems, and a government software development effort to integrate AOEW into the Soft Kill Coordination System (SKCS) to gain maximum effectiveness from the decoy through coordination with an onboard system.

The DDE Preliminary Design contract was awarded Dec 2016 followed by a System Requirements Review (SRR)/System Functional Review (SFR) leading to a Preliminary Development Review (PDR) all in FY17. The Engineering Manufacturing and Development (EMD) Option was awarded in Sep 2017. Following the arrival of Engineering Development Model (EDMs) the Factory Qualification Test (FQT) will be completed to support development testing and NAVAIR flight certification. Initial Operational Test & Evaluation (IOT&E) is planned in FY21 to support the Full Rate Production (FRP) decision in FY22.

When the DDE Preliminary Design contract award shifted from June 2016 to Dec 2016, the EDM contract delivery requirements were re-phased to deliver the capability to the Fleet as soon as possible. MH-60R and MH-60S were originally scheduled to be integrated and flight tested in the same fiscal year (FY19), but integration and flight testing of the MH-60S has been shifted to FY21.

The funding increase in FY19 is primarily due to system integration and certification testing for two platforms. AOEW requires integration into two separate host platforms, the MH-60R/S helicopter and the ship which drives additional software and testing requirements. In FY19, there is testing for both standard shipboard certification testing (NAVSEA) as well as flight certification testing (NAVAIR) related to system integration. Further, the program will fund the development of the software Avionics Operating Program (AOP) update to the helicopter and development of Soft Kill Coordinator Subsystem (SKCS) for integration with AN/SLQ-32(V)6. Additionally, material for the first four EDMs (1-4) will be purchased in FY19. Material for the remaining two EDMs (5-6) will be purchased in FY20. The integration to two platforms, helicopter and ship, coupled with the material purchase in FY19 drives the increased funding requirement.

3321 - SEWIP Block 3 is developing an Electronic Attack (EA) capability improvement required for the AN/SLQ-32(V) system to keep pace with the threat. SEWIP Block 3 will provide the AN/SLQ-32(V)7 system for all surface ships (CVN, DDG, LHD) outfitted with the active variant of the AN/SLQ-32, mainly the (V)3 and (V)4, as well as select new construction platforms.

The SEWIP Block 3 Acquisition leverages technology developed under the Office of Naval Research's (ONR) Integrated Topside (InTop) Science and Technology (S&T) effort. SEWIP Block 3 will continue to expand the integrated shipboard combat system by providing a new integrated EA transmitter, array, and associated EA techniques. The AN/SLQ-32(V)7 integrates the new EA countermeasure (SEWIP Block 3) with the AN/SLQ-32(V)6. The AN/SLQ-32(V)6 includes an Electronic Support(ES) receiver (SEWIP Block 2), a High Gain High Sensitivity (HGHS) receiver (SEWIP Block 1B3), a Specific Emitter Identifier (SEI) receiver (SEWIP Block 1B2), display console, and backend electronics. SEWIP Block 3 includes a government software development and integration effort for a SoftKill Coordinator (SKC) to manage EA engagements. SEWIP Block 3 is developing an Electronic Warfare Test Bed (EWTB) to validate system performance.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604757N *I Ship Self Def (Engage: Soft Kill/EW)*

SEWIP Block 3 developed and deployed a limited interim capability, starting in 2014, of a focused application of the Naval Research Lab (NRL) Transportable EW Module (TEWM) systems to support CNO Urgent Operational Needs (UON). Block 3T (AN/SLQ-59) is the TEWM system supporting the 7th fleet UON. TEWM Speed to Fleet (STF) (AN/SLQ-62) is the TEWM system supporting the 6th fleet UON. A capability enhancement upgrade for the AN/SLQ-62 was developed in FY2017.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	114.211	103.391	125.015	-	125.015
Current President's Budget	108.630	103.391	120.507	-	120.507
Total Adjustments	-5.581	0.000	-4.508	-	-4.508
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	7.500	0.000			
• SBIR/STTR Transfer	-2.748	0.000			
• Program Adjustments	0.000	0.000	-1.690	-	-1.690
• Rate/Misc Adjustments	0.000	0.000	-2.818	-	-2.818
• Congressional General Reductions Adjustments	-0.011	-	-	-	-
• Congressional Directed Reductions Adjustments	-10.322	-	-	-	-

Change Summary Explanation

Added FY 2017 funding in support of SEWIP Block 3.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 0954 / *Shipboard EW Improvement Program*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0954: *Shipboard EW Improvement Program*	484.685	10.690	16.013	15.835	-	15.835	16.026	16.393	16.673	17.013	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

0954 - The Surface Electronic Warfare Improvement Program (SEWIP) is segmented into Block 1A, Block 1B, Block 2, Block 3, and Soft Kill Coordination System (SKCS). Block 1A upgraded the AN/SLQ-32 pulse-processing computers and the display consoles allowing the system to more quickly identify threats and better display the information to the operator. Block 1B added adjunct sensors for special signal intercept, including Specific Emitter Identification (SEI), and High Gain High Sensitivity (HGHS) (Block 1B3), a critical improvement for the threat correlation, situational awareness, and extending the battle space. Block 2 enhanced Surface Electronic Warfare (EW) and provided improved Anti-Ship Missile Defense (ASMD) and situational awareness through an improved Electronic Support (ES) receiver, antenna, and combat system interface. The addition of Block 2 to Block 1B3 forms the AN/SLQ-32 (V)6. Block 3 will provide an enhanced electronic attack capability to improve ASMD and counter-targeting. The addition of Block 3 to AN/SLQ-32 (V)6 forms the AN/SLQ-32(V)7 system. EW Rapid Capability Insertion Process (RCIP) identifies system and mission capability gaps by analyzing EW baseline and fleet requirements, prioritizes those gaps based on fleet input and critical technology maturity, and develops upgrades to the AN/SLQ-32(V) product line to address those gaps. The SKCS will provide Soft Kill (SK) weapon coordination and enhanced situational awareness to the AN/SLQ-32 (V)6 with EW/radar track association to support SK engagement decisions, including Radar Cued Engagements (RCE) and Electronic Attack (EA) with both onboard EA, provided by AN/SLQ-32 (V)7, and off-board EA. RCIP also integrates Future Naval Capability (FNC) programs into SEWIP.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Electronic Warfare Rapid Capability Insertion Process (EW RCIP)	10.690	16.013	15.835	0.000	15.835
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue RCIP #4 Aegis Baseline 9.C2 SKCS integration efforts with AN/SLQ-32 to address platform gaps for automatic and semi-automatic engagements using NULKA decoys and the onboard Electronic Attack (EA) (AN/SLQ-32 (V)7) and offboard EA systems; Continue to provide software upgrades every four months utilizing the agile flexible software development process; Initiate and complete software development and system integration and testing activities for software builds 5, 6 and 7 to enhance the onboard EA and offboard EA controllers to provide more complex and coordinated EA capabilities in accordance with approved critical design and the softkill capability improvement phasing plan; Continue combat system level integration and testing activities with AEGIS by completing element certification in support of AEGIS ACB BL 9.2.0 (Phase 0) while starting Combat System (CS) integration and testing activities with AEGIS ACB BL 9.2.1 (Phase 1) in support of the Baseline					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 0954 / *Shipboard EW Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
9.2.1 demonstration; Initiate pre-design and design activities to support integration with Ship Self Defense System (SSDS), Fast Frigate (FF), Offshore Patrol Cutter (OPC), and Solid State Laser (SSL) weapon system. - Initiate the transition of future naval capability (FNC) program Softkill Performance and Real-Time Assessment (SPARTA) into SKCS; Develop the interface, architecture and algorithms required for SPARTA transition into SKCS; Develop algorithms to measure key features observed in Softkill (SK) engagements and measure EA effectiveness; Develop algorithms to provide real-time assessment of SK performance to SEWIP; Initiate the development of improved fleet weapons coordination, informed Hard Kill(HK)/SK prioritization, weapons conservation, and enhanced operator battlespace awareness by contributing integral feedback regarding non-kinematic performance; Assess the results and readiness of the SPARTA demonstration for insertion into SKCS pre-design materials. - Continue RCIP #5 improvements to increase EW Tactical Simulation (TACSIM) capabilities; Perform system integration activities with Ship Self Defense System (SSDS), SKCS, ACB-16, and the onboard Surface Electronic Warfare Team Trainer (SEWTT); Perform software updates in tactical simulator to provide advanced training capabilities based on future system requirements. Complete TACSIM Phase 2: develop SLQ-32 simulation and interactive operator training allowing for response to system-generated tactical scenarios. Update AN/SLQ-32(V)6 tactical build with SEI and HGHS simulation. Develop training scenarios for Battle Force Electronic Warfare Trainer (BEWT) and SEWTT utilizing a common High Level Architecture (HLA) source. Initiate the TACSIM Phase 3 effort to incorporate AN/SLQ-(V)6 Build 6 with SKCS into the training interface, and add enhanced combat system simulation that would support training for SKCS scenarios with tracking and response tactics for incoming threats. - Continue Algorithm Development of Enhanced Processing Techniques (ADEPT) improvements to SEWIP emitter processing; Perform integration efforts with AN/SLQ-32(V)6 systems and evaluate and analyze ADEPT and AN/SLQ-32(V)6 integration test results; Update software based on future requirements. - Initiate RCIP #6 improvements which focus on increasing the AN/SLQ-32 (V)6 operator's tactical situational awareness. Develop a commercial upgrade of the field-programmable gate arrays (FPGA), in the AN/SLQ-32(V)6 that will enable the system to keep pace with advanced threats and advanced processing algorithms and enhance the Electronic Support (ES) mission of the AN/SLQ-32(V)6; Add advanced capabilities to the built-in-test (BIT) effectiveness by updating the architecture and software with enhancements to the operator's tactical awareness of current EW system operation status that are targeted at increasing the operator's confidence in system performance and ability to successfully carry out shipboard repairs. - Develop SEWTT V5.1 capabilities; Develop countermeasure training to support bearing only cued launches, electronic sense cued launches, and auto, semi-auto, and manual launches; Develop training to support organic and distributed training of Electronic Attack (EA) pod for persistent Anti-Ship Missile Defense (ASMD); Develop					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 0954 / *Shipboard EW Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
additional SKCS integration; Develop SLQ-32 operator training for correct configuration of default platform type (DPT) and effective countermeasure deployment against incoming threats. - Continue Electro Optics/Infrared (EO/IR) development; Initiate and provide systems engineering process improvements and address identified performance gaps. Develop additional surface EO/IR concepts of operation, tactics, and design by modeling threat behavior and its reaction to fleet tactics. - Develop an advanced AN/SLQ-32(V)6 electronic warfare (EW) testing system to provide improved capability for the operator to assess and validate optimal system performance; Create the automated test framework through the design and development of advanced algorithms and framework testing scenarios; Demonstrate performance of the advanced test system and operator interaction on an EW hardware system. - Identify additional EW technology shortfalls and capability gaps based on the current and emerging ASM threats and fleet requirements; solicit industry, University Affiliate Research Centers or government activities for technical solutions; Evaluate and select RCIP technology candidates; evaluate RCIP technologies production readiness.					
FY 2019 Base Plans: - Continue RCIP #4 Aegis baseline 9.C2 integration efforts with AN/SLQ-32 to address platform gaps for automatic and semi-automatic engagements using Nulka decoys and the onboard Electronic Attack (EA) (AN/SLQ-32 (V)7) and offboard EA systems; Continue to provide software upgrades every four months; Initiate and complete software development and system integration and testing activities for software builds 8, 9 and 10, which provide enhanced EA capabilities, including the addition of offboard EA resources, AOEW emitter/track association, AOEW HK/SK interoperability, AN/SLQ-32(V)7 and AOEW combination techniques, solid state laser (SSL) weapon system support, OPC support, FF support, and Nulka decoy grouping, in accordance with the approved critical design and SK capability phasing plan.; Continue integration and testing activities in support of AEGIS ACB 16 baseline by completing element certification in support of AEGIS ACB BL 9.2.1 (Phase 1), while starting CS integration with AEGIS ACB BL 9.2.2 (Phase 2) in support of the Baseline 9.2.2 demonstration; Complete SKCS Formal Qualification Testing (FQT) for builds 8, 9, and 10, and system integration events with AN/SLQ-32(V)6, AN/SLQ-32(V)7 and Offboard EW; Begin SSDS ACB 20 integration support efforts. - Continue the transition of the Future Naval Capability (FNC) program, Softkill Performance and Real-Time Assessment (SPARTA) into SKCS; Utilize developed algorithms to measure key features observed in Softkill (SK) engagements and EA effectiveness and perform real-time assessment of SK performance. Complete the development of improved fleet weapons coordination, informed Hard Kill(HK)/SK prioritization, weapons conservation, and enhanced operator battlespace awareness by continuing to contribute integral feedback regarding non-kinematic performance. Continue to develop and update the interface, architecture and algorithms					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 0954 / *Shipboard EW Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
required for full transition into SKCS, taking into account ongoing SKCS build and capability completions. Continue to assess the results and readiness of the SPARTA demonstration for transition into an SKCS Build. - Continue RCIP #5 improvements to increase EW Tactical Simulation (TACSIM) capabilities to include system integration with Ship Self Defense System (SSDS), SKCS, ACB-16, and the onboard Surface Electronic Warfare Team Trainer (SEWTT); Complete TACSIM Phase 3 effort by implementing the improvements through integration and testing, installation, and verification of completed upgrades. Complete the efforts to incorporate AN/SLQ-(V)6 Build 6 with SKCS, and the enhanced combat system simulation supporting training for SKCS scenarios with tracking and response tactics for incoming threats. Initiate TACSIM Phase 4 development efforts to integrate new EA systems into the tactical training programs. - Continue Algorithm Development of Enhanced Processing Techniques (ADEPT) improvements to SEWIP emitter processing; Initiate integration efforts with AN/SLQ-32(V)7 system and the High Gain Antenna subsystem; Continue to update software based on future requirements. - Continue RCIP #6 improvements to AN/SLQ-32(V)6 Electronic Warfare system to increase the operator's tactical situational awareness; Continue with the effort to add advanced capabilities to the built-in-test (BIT) effectiveness through update of the architecture and software enhancements to improve EW operator tactical awareness. Add enhanced capabilities to the upgrade of the field-programmable gate arrays (FPGA) to include providing inputs for circuit board redesigns, create final end-item shipboard products, validate FPGA performance, and incorporate updates to FPGA and circuit card assemblies based on performance and technical reviews. Initiate efforts to improve the understanding and classification of complex emitters, increase system performance against anti-ship cruise missiles (ASCMs), and perform passive ranging of radio frequency (RF) emitting platforms. - Initiate AN/SLQ-32(V)6 Software Algorithm Enhancements to the SEWIP software baseline: Develop requirements for updating the mapping of Product Line Architecture (PLA) messages to support enhanced SKCS and SLQ-32(V)6 Human Machine Interface (HMI) functionalities; Improve the baseline to add functionality for automatically supporting multiple versions of the Data Adaption Processor (DAP) and the PLA; Initiate improvements to the AN/SLQ-32(V)6 pulse processing and de-interleaving algorithms by determining system limitations and requirements for electronic systems processing upgrades, to classify complex emitter signals with an improved response time. - Identify additional EW technology shortfalls and capability gaps based on the current and emerging ASM threats and fleet requirements; solicit industry, University Affiliate Research Centers or government activities for					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 0954 / *Shipboard EW Improvement Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
technical solutions; Evaluate and select RCIP technology candidates; Evaluate RCIP technologies production readiness. ***FY 2019 OCO Plans:*** - N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Decrease in FY19 due to minor program and rate adjustments.					
Accomplishments/Planned Programs Subtotals	10.690	16.013	15.835	0.000	15.835

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2312: *OPN BA-2 AN/SLQ-32(V)*	244.001	240.433	420.344	-	420.344	554.399	693.782	498.954	478.252	1,262.099	5,175.418
• 24575N & 72827N/1C2C: *OMN BA-1 AN/SLQ-32(V)*	7.533	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	58.489
• 24575N & 72827N/1C1C: *OMN BA-1 AN/SLQ-32(V)*	0.000	7.955	7.827	-	7.827	8.191	8.376	9.013	9.076	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Rapid Capability Insertion Process(RCIP) is a process that identifies candidate capability gap/technology solution pairs, refines the value proposition description for each pair, prioritizes projects for funding and executes projects that result in improved capability transitioned to the fleet.

E. Performance Metrics

Successfully identify RCIP capabilities.
Successfully identify and assess RCIP Science & Technology candidates.
Successfully demonstrate and validate RCIP capabilities.
Complete SKCS Builds in accordance with the Agile Software Development process.
Complete installation of TACSIM upgrades.
Transition the Future Naval Capability program Softkill Performance and Real-Time Assessment (SPARTA) into SKCS.
Complete ADEPT integration efforts with AN/SLQ-32(V)6 systems.
Complete AN/SLQ-32(V)6 EA tactical situational awareness improvements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 0954 / *Shipboard EW Improvement Program*

Complete AN/SLQ-32(V)6 Software Algorithm Enhancements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 0954 / *Shipboard EW Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ancillary Hardware Development	Various	Various : Various	151.420	0.000		0.000		0.000		-		0.000	0.000	151.420	-
ESE Development	SS/CPFF	Northrop Grumman : Goleta, CA	13.037	0.000		0.000		0.000		-		0.000	0.000	13.037	-
ICAD Development	SS/CPFF	GD-AIS : Fairfax, VA	11.747	0.000		0.000		0.000		-		0.000	0.000	11.747	-
ESE Development (Block 1A)	SS/CPFF	Northrop Grumman : Goleta, CA	0.471	0.000		0.000		0.000		-		0.000	0.000	0.471	-
System Integrator	C/CPAF	GD-AIS : Fairfax, VA	13.798	0.000		0.000		0.000		-		0.000	0.000	13.798	-
1B Development	SS/CPIF	GD-AIS : Fairfax, VA	86.292	0.000		0.000		0.000		-		0.000	0.000	86.292	-
Q-70 Mods	C/CPFF	LM-EAGAN : Eagan, MN	3.491	0.000		0.000		0.000		-		0.000	0.000	3.491	-
Block 2 Study/ Development	C/CPIF	BAE : Nashua, NH	0.336	0.000		0.000		0.000		-		0.000	0.000	0.336	-
ALQ210 Integration	WR	NSWC Dahlgren : Dahlgren, VA	10.345	0.000		0.000		0.000		-		0.000	0.000	10.345	-
Rapid Capability Insertion Process (RCIP) #1	C/CPIF	Lockheed Martin : Syracuse, NY	2.000	0.000		0.000		0.000		-		0.000	0.000	2.000	-
RCIP #1	WR	NSWC Dahlgren : Dahlgren, VA	0.650	0.000		0.000		0.000		-		0.000	0.000	0.650	-
RCIP #2	SS/CPFF	Northrop Grumman : Goleta, CA	2.514	0.000		0.000		0.000		-		0.000	0.000	2.514	-
RCIP #2	SS/FFP	GD-AIS : Fairfax, VA	0.734	0.000		0.000		0.000		-		0.000	0.000	0.734	-
RCIP #3	SS/CPFF	EWA-GSI : Fairmont, WV	1.978	0.000		0.000		0.000		-		0.000	0.000	1.978	-
RCIP #3	WR	ONR/ACI : Washington, DC	3.130	0.000		0.000		0.000		-		0.000	0.000	3.130	-
RCIP #4	SS/CPFF	APL : Laurel, MD	1.348	1.548	Nov 2016	1.989	Nov 2017	1.217	Nov 2018	-		1.217	Continuing	Continuing	Continuing
RCIP #4	WR	NSWC Dahlgren : Dahlgren, VA	2.603	3.945	Nov 2016	3.730	Nov 2017	3.392	Nov 2018	-		3.392	Continuing	Continuing	Continuing
RCIP #5	WR	NSWC Dahlgren : Dahlgren, VA	1.235	1.115	Nov 2016	2.458	Nov 2017	2.297	Nov 2018	-		2.297	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 0954 / *Shipboard EW Improvement Program*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RCIP #6	WR	NSWC Crane : Crane, IN	0.000	0.000		1.750	Jan 2018	2.263	Nov 2018	-		2.263	Continuing	Continuing	Continuing
AN/SLQ-32(V)6 Software Algorithm Enhancements	TBD	TBD : TBD	0.000	0.000		0.000		1.102	Nov 2018	-		1.102	0.000	1.102	-
SEWTT Development	SS/CPFF	EWA : Fairmont, WV	0.000	0.100	May 2017	0.591	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	307.129	6.708		10.518		10.271		-		10.271	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 1 Integrated Logistics Support	WR	NSWC Crane, DD, NRL, APL : Crane, IN; Dahlgren, VA; Washington, DC; Laurel,MD	9.912	0.000		0.000		0.000		-		0.000	0.000	9.912	-
Block 1 Integrated Logistics Support	WR	NSWC Crane : Crane, IN	3.418	0.000		0.000		0.000		-		0.000	0.000	3.418	-
Block 1 Integrated Logistics Support	WR	NSWC DD : Dahlgren, VA	0.293	0.000		0.000		0.000		-		0.000	0.000	0.293	-
Block 1 Government Engineering Support	WR	NSWC Crane, DD, NRL, APL : Crane, IN; Dahlgren, VA; Washington, DC; Laurel,MD	34.783	0.000		0.000		0.000		-		0.000	0.000	34.783	-
Block 1 Government Engineering Support	WR	NSWC Dahlgren : Dahlgren, VA	5.738	0.874	Nov 2016	1.140	Nov 2017	0.911	Nov 2018	-		0.911	Continuing	Continuing	Continuing
Block 1 Government Engineering Support	WR	NSWC Crane : Crane, IN	5.034	0.180	Jan 2017	0.529	Nov 2017	0.849	Nov 2018	-		0.849	Continuing	Continuing	Continuing
Block 1 Government Engineering Support	WR	NRL : Washington, DC	3.133	0.680	Nov 2016	0.701	Nov 2017	0.547	Nov 2018	-		0.547	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 0954 / *Shipboard EW Improvement Program*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 1 Government Engineering Support	SS/CPFF	APL : Laurel, MD	2.343	0.522	Feb 2017	0.056	Jan 2018	0.307	Nov 2018	-		0.307	0.000	3.228	-
Block 1 Government Engineering Support	WR	SWRMC : San Diego, CA	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Block 1 Government Engineering Support	WR	MIT : Hanscom AFB, MA	0.516	0.119	May 2017	1.377	Jan 2018	1.230	Nov 2018	-		1.230	Continuing	Continuing	Continuing
Block 1 Government Engineering Support	WR	MITRE : Aberdeen Proving Ground, MD	0.527	0.000		0.000		0.000		-		0.000	0.000	0.527	-
Block 1 Government Engineering Support	WR	NUWC Keyport : Keyport, WA	0.253	0.000		0.000		0.000		-		0.000	0.000	0.253	-
Block 1 SIPRNET Access	WR	ARL : Adelphi, MD	0.092	0.000		0.000		0.000		-		0.000	0.000	0.092	-
Block 1B3 Install on test ship	WR	NSSA Norfolk : Norfolk, VA	0.857	0.000		0.000		0.000		-		0.000	0.000	0.857	-
Block 1B3 Integration	WR	Lockheed Martin : Syracuse, NY	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
Block 1 Government Engineering Support	WR	DISA : Fort Meade, MD	0.000	0.000		0.150	Jan 2018	0.000		-		0.000	0.000	0.150	-
		Subtotal	68.099	2.375		3.953		3.844		-		3.844	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 1 Integration and Test	WR	NSWC Crane, DD, NRL : Crane, IN; Dahlgren, VA; Washington, DC	0.853	0.000		0.000		0.000		-		0.000	0.000	0.853	-
Developmental Test & Evaluation	Various	Various : Various	8.958	0.000		0.000		0.000		-		0.000	0.000	8.958	-
Block 1A Test Planning/ T&E Events	WR	NSWC Crane, DD, NRL : Crane,	11.036	0.000		0.000		0.000		-		0.000	0.000	11.036	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 0954 / *Shipboard EW Improvement Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		IN; Dahlgren, VA; Washington, DC													
Block 1B Test Planning/ T&E Events	WR	NSWC Crane, DD, NRL, NAVAIR, OPTEVFOR, NSWC PHD : Crane, IN; Dahlgren, VA; Washington, DC; MD; CA	9.567	0.000		0.000		0.000		-		0.000	0.000	9.567	-
Block 1B Test Planning/ T&E Events	WR	NSWC Dahlgren : Dahlgren, VA	3.231	0.000		0.000		0.000		-		0.000	0.000	3.231	-
Block 1B Test Planning/ T&E Events	WR	NSWC Crane : Crane, IN	3.026	0.000		0.000		0.000		-		0.000	0.000	3.026	-
Block 1B Test Planning/ T&E Events	WR	NRL : Washington, DC	5.365	0.000		0.000		0.000		-		0.000	0.000	5.365	-
Block 1B Test Planning/ T&E Events	WR	OPTEVFOR : Norfolk, VA	0.612	0.000		0.000		0.000		-		0.000	0.000	0.612	-
Block 1B Test Planning/ T&E Events	WR	JITC : Indian Head, MD	0.288	0.000		0.000		0.000		-		0.000	0.000	0.288	-
(V)4 ESE Test Planning/ T&E Events	WR	NSWC Crane, DD, NRL : Crane, IN; Dahlgren, VA; Washington, DC	0.686	0.000		0.000		0.000		-		0.000	0.000	0.686	-
(V)4 ESE Test Planning/ T&E Events	WR	NSWC Dahlgren : Dahlgren, VA	0.609	0.000		0.000		0.000		-		0.000	0.000	0.609	-
(V)4 ESE Test Planning/ T&E Events	WR	NSWC Crane : Crane, IN	1.153	0.000		0.000		0.000		-		0.000	0.000	1.153	-
(V)4 ESE Test Planning/ T&E Events	WR	NRL : Washington, DC	1.808	0.000		0.000		0.000		-		0.000	0.000	1.808	-
(V)4 ESE Test Planning/ T&E Events	WR	OPTEVFOR : Norfolk, VA	0.192	0.000		0.000		0.000		-		0.000	0.000	0.192	-
RCIP Test Planning/T&E Events	WR	NSWC Dahlgren : Dahlgren, VA	1.502	0.394	Jan 2017	0.500	Nov 2017	0.342	Nov 2018	-		0.342	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 0954 / *Shipboard EW Improvement Program*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RCIP Test Planning/T&E Events	WR	NSWC Crane : Crane, IN	0.889	0.000		0.000		0.000		-		0.000	0.000	0.889	-
RCIP Test Planning/T&E Events	WR	NRL : Washington, DC	1.729	0.000		0.000		0.000		-		0.000	0.000	1.729	-
RCIP Test Planning/T&E Events	SS/CPFF	APL : Laurel, MD	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
RCIP Test Planning/T&E Events	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.104	May 2017	0.169	Jan 2018	0.205	Nov 2018	-		0.205	Continuing	Continuing	Continuing
		Subtotal	51.604	0.498		0.669		0.547		-		0.547	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 1 Program Management Support	C/CPIF	SPA (SEAPORT) : Washington, D.C.	32.702	0.000		0.000		0.000		-		0.000	0.000	32.702	-
Block 1 Program Management Support	C/CPIF	TMB (SEAPORT) : Washington, D.C.	0.399	0.362	Jan 2017	0.110	Nov 2017	0.494	Nov 2018	-		0.494	Continuing	Continuing	Continuing
Block 1 Program Management Support	SS/CPIF	SPA (BRIDGE) : Washington, DC	1.064	0.209	Jan 2017	0.000		0.000		-		0.000	0.000	1.273	-
Block 1 Program Management Support	C/CPIF	SPA : Washington, DC	0.000	0.500	Aug 2017	0.544	Nov 2017	0.639	Nov 2018	-		0.639	Continuing	Continuing	Continuing
Block 1 Program Managment Support	C/CPIF	CACI (SEAPORT) : Washington, DC	0.165	0.000		0.179	Nov 2017	0.000		-		0.000	0.000	0.344	-
Block 1 Program Management Support	WR	NSWC Crane, DD, NRL : Crane, IN; Dahlgren, VA; Washington, DC	17.310	0.000		0.000		0.000		-		0.000	0.000	17.310	-
Block 1 Program Management Support	WR	NSWC Crane : Crane, IN	1.636	0.000		0.000		0.000		-		0.000	0.000	1.636	-
Block 1 Program Management Support	WR	NSWC Dahlgren : Dahlgren, VA	1.662	0.000		0.000		0.000		-		0.000	0.000	1.662	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 0954 / *Shipboard EW Improvement Program*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 1 Program Management Support	WR	NRL : Washington, DC	0.977	0.000		0.000		0.000		-		0.000	0.000	0.977	-
Block 1 Program Management Support	SS/CPFF	APL : Laurel, MD	0.527	0.000		0.000		0.000		-		0.000	0.000	0.527	-
Block 1 Travel	WR	NAVSEA Program Office Travel : Washington, DC	1.285	0.038	Jan 2017	0.040	Nov 2017	0.040	Nov 2018	-		0.040	Continuing	Continuing	Continuing
Block 1 DoD Acquistion Workforce Fund	Various	Various : Various	0.126	0.000		0.000		0.000		-		0.000	0.000	0.126	-
		Subtotal	57.853	1.109		0.873		1.173		-		1.173	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	484.685	10.690		16.013		15.835		-		15.835	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 0954 / *Shipboard EW Improvement Program*

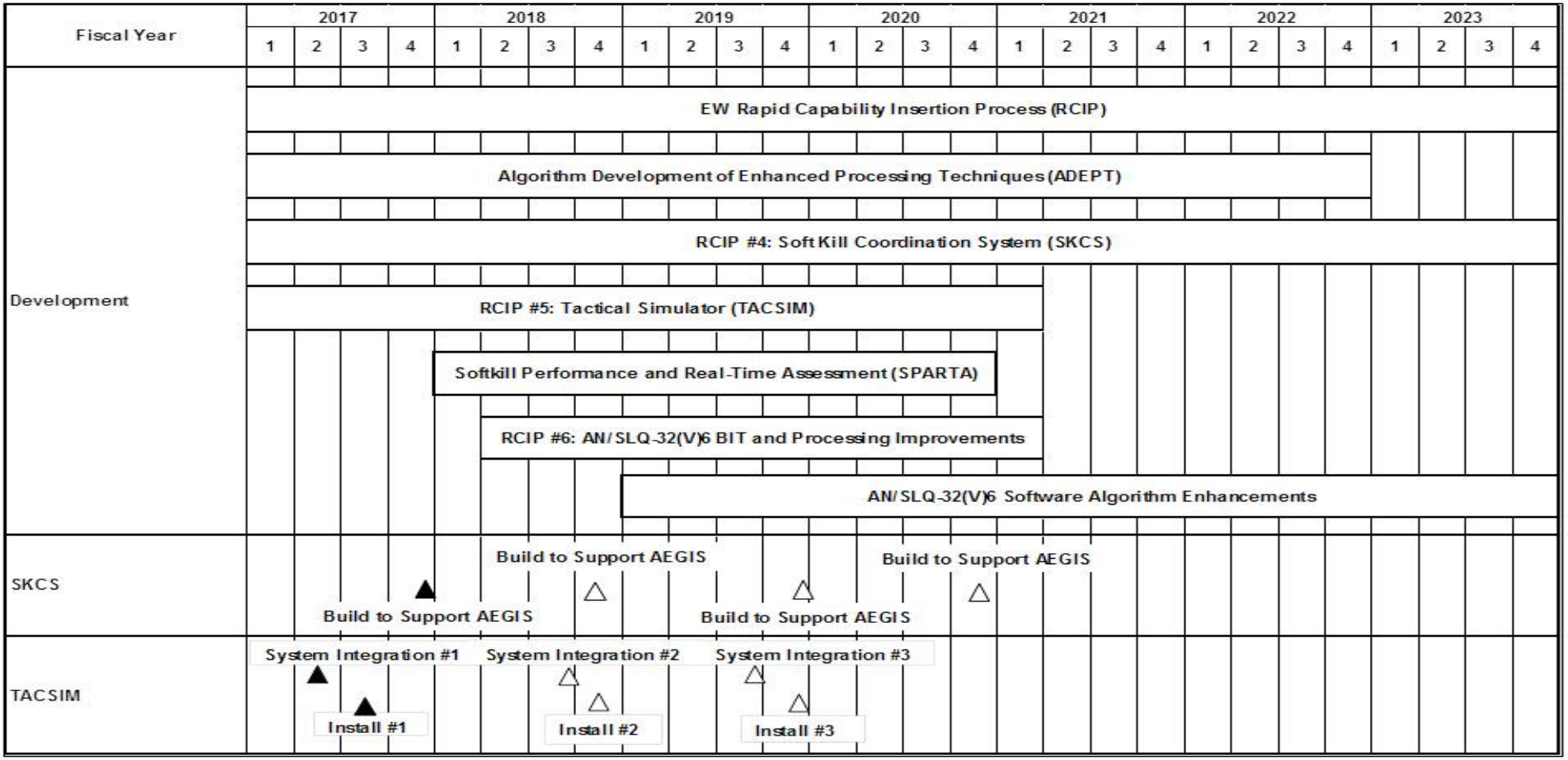


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 0954 / *Shipboard EW Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0954				
EW Rapid Capability Insertion Process (RCIP)	1	2017	4	2023
Algorithm Development of Enhanced Processing Techniques (ADEPT)	1	2017	4	2022
RCIP #4: SKCS	1	2017	1	2023
RCIP #5 TACSIM	1	2017	4	2020
TACSIM System Integrations and Installs 1-3	2	2017	4	2019
SKCS SW Builds to Support Aegis	4	2017	4	2020
Softkill Performance and Real-Time Assessment (SPARTA)	1	2018	4	2020
RCIP #6: AN/SLQ-32(V)6 BIT and Processing Improvements	2	2018	1	2021
AN/SLQ-32(V)6 Software Algorithm Enhancements	1	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 2190 / *NULKA Decoy*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2190: *NULKA Decoy*	65.537	1.925	4.181	3.975	-	3.975	5.234	5.384	7.509	7.683	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Offboard Active Decoy (NULKA) is a joint cooperative program between the United States and Australia that developed an active offboard decoy that utilizes a broadband radio frequency repeater mounted atop a hovering rocket. NULKA is designed to counter a wide variety of present and future radar guided Anti-Ship Missiles (ASMs) by radiating a large radar cross section while flying a ship-like trajectory. The United States developed the electronic payload and fire control system, while Australia developed the hovering rocket. Future efforts involve development of the capability for high value unit protection. Increased funding beginning in FY18 is required for DLP technology refresh to address obsolescence issues.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NULKA Decoy Subsystem	1.925	4.181	3.975	0.000	3.975
Articles:	-	-	-	-	-
FY 2018 Plans: - Evaluate intelligence on new and existing threats. Update Nulka Fly Out Tactics to maximize Nulka performance and effectiveness. - Commence DLP technology refresh to address obsolescence issues.					
FY 2019 Base Plans: - Continue to evaluate intelligence on new and existing threats. Continue to update Nulka Fly Out Tactics to maximize Nulka performance and effectiveness. - Continue DLP technology refresh to address obsolescence issues.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease is due to minor program and rate adjustments.					
Accomplishments/Planned Programs Subtotals	1.925	4.181	3.975	0.000	3.975

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 2190 / *NULKA Decoy*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/5231: *Ship Missile Support Equipment*	62.792	66.407	32.250	-	32.250	78.075	67.227	66.813	71.054	Continuing	Continuing
• OMN/12CR0 (1C2C): *Nulka*	5.717	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• OMN/11CD0 (1C1C): *Nulka*	0.000	6.044	6.087	-	6.087	6.370	6.528	7.321	7.512	Continuing	Continuing

Remarks

OPN Controls reflect the following Line Item 5231 Project Units (PU's) under the 'ANTI-SHIP MISSILE DECOY SYSTEM' program: VV001, VV002, VV003, VV004, VV830, VV831, VV832, and VV833.

D. Acquisition Strategy

NULKA is a joint cooperative program between United States and Australia in full rate production.

E. Performance Metrics

Successfully complete Decoy Launch Processor (DLP) technology refresh.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 2190 / *NULKA Decoy*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	Lockheed Martin : Sippican, MA	6.692	0.000		0.000		0.000		-		0.000	0.000	6.692	-
Primary Hardware Development	MIPR	BAE Systems : Australia	7.382	0.000		0.000		0.000		-		0.000	0.000	7.382	-
Systems Engineering	WR	NRL : Washington, DC	19.672	0.250	Dec 2016	0.655	Jan 2018	0.700	Nov 2018	-		0.700	Continuing	Continuing	Continuing
Systems Engineering	WR	NWAD : China Lake, CA	0.120	0.000		0.000		0.000		-		0.000	0.000	0.120	-
MK 53 System Eng Changes	C/FFP	Sechan : PA	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
Systems Engineering	WR	NSWC Dahlgren : Dahlgren, VA	10.267	1.200	Nov 2016	2.816	Nov 2017	2.551	Nov 2018	-		2.551	Continuing	Continuing	Continuing
Systems Engineering	WR	NSMA : VA	0.360	0.000		0.000		0.000		-		0.000	0.000	0.360	-
Systems Engineering	WR	NSWC Crane : IN	6.581	0.224	Dec 2016	0.200	Nov 2017	0.204	Nov 2018	-		0.204	Continuing	Continuing	Continuing
		Subtotal	51.224	1.674		3.671		3.455		-		3.455	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NRL : Washington, DC	1.514	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development	WR	NSWC Dahlgren : Dahlgren, VA	2.908	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development	MIPR	BAE Systems : Australia	1.009	0.000		0.000		0.000		-		0.000	0.000	1.009	-
		Subtotal	5.431	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 2190 / *NULKA Decoy*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Dahlgren : Dahlgren, VA	1.275	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	NRL : Washington, DC	1.681	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Assets	WR	NRL : Washington, DC	1.504	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Support	WR	OPTEVFOR : Norfolk, VA	0.050	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Support	WR	BAE Systems : Australia	0.050	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	4.560	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPIF	SPA (SEAPORT) : Washington, DC	2.014	0.000		0.000		0.000		-		0.000	0.000	2.014	Continuing
Program Management Support	SS/CPIF	SPA (BRIDGE) : Washington, DC	0.094	0.000		0.000		0.000		-		0.000	0.000	0.094	-
Program Management Support	C/FFP	AT&T Gov't Solutions (SEAPORT): : Washington, DC	1.147	0.000		0.000		0.000		-		0.000	0.000	1.147	-
Program Management Support	C/CPIF	Gryphon Technology (SEAPORT) : Washington, DC	0.226	0.000		0.000		0.000		-		0.000	0.000	0.226	-
Program Management Support	C/CPIF	ICI (SEAPORT) : Washington, DC	0.086	0.035	Jan 2017	0.100	Jan 2018	0.102	Nov 2018	-		0.102	0.000	0.323	-
Program Management Support	C/CPIF	TMB (SEAPORT) : Washington, DC	0.067	0.086	Jan 2017	0.100	Jan 2018	0.102	Nov 2018	-		0.102	0.000	0.355	-
Program Management Support	C/CPIF	SPA : Washington, DC	0.000	0.095	Aug 2017	0.300	Jan 2018	0.306	Nov 2018	-		0.306	0.000	0.701	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 2190 / *NULKA Decoy*	

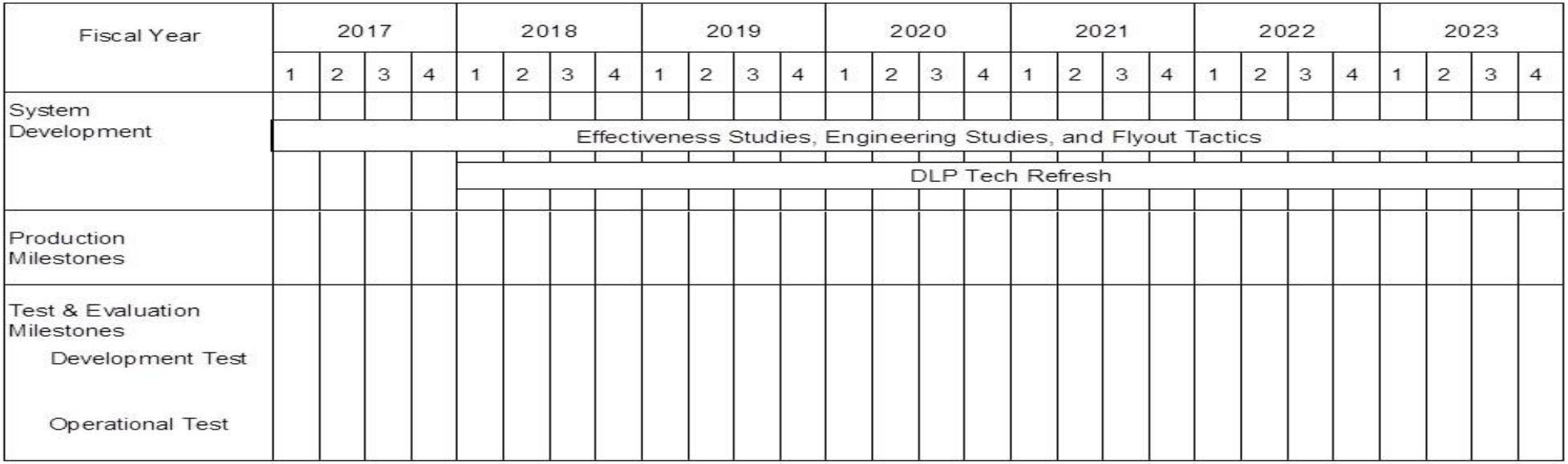
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA Program Office Travel : Washington, DC	0.673	0.010	Apr 2017	0.010	Jan 2018	0.010	Nov 2018	-		0.010	Continuing	Continuing	Continuing
Program Management Support	WR	DISA : Pensacola, FL	0.000	0.025	Sep 2017	0.000		0.000		-		0.000	0.000	0.025	-
DoD Acquisition Workforce Fund (DAWDF)	Various	Various : Various	0.015	0.000		0.000		0.000		-		0.000	0.000	0.015	-
		Subtotal	4.322	0.251		0.510		0.520		-		0.520	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	65.537	1.925		4.181		3.975		-		3.975	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 2190 / *NULKA Decoy*



DLP - Decoy Launch Processor

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 2190 / *NULKA Decoy*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2190				
Effectiveness Studies, Engineering Studies, and Flyout Tactics	1	2017	4	2023
DLP Tech Refresh	1	2018	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3227 / *SEWIP Block 2*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3227: *SEWIP Block 2*	222.848	0.303	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	223.151
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The SEWIP Block 2 program is developing an upgraded antenna, receiver, and combat system interface for AN/SLQ-32. The upgrades are necessary in order to pace the threat, improving detection, accuracy, and mitigation of EMI.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SEWIP Block 2	0.303	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A OCO: N/A FY2018-FY2023 funds were realigned to SEWIP Block 1 (PU 0954) for RCIP efforts, as SEWIP Block 2 achieved FRP in 4th quarter FY2016. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	0.303	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2312: *OPN BA-2 AN/SLQ-32(V)*	244.001	240.433	420.344	-	420.344	554.399	693.782	498.954	478.252	1,262.099	5,175.418

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3227 / *SEWIP Block 2*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OMN/0204575N/1C2C: *OMN BA-1 AN/SLQ-32(V)6*	11.375	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.894
• OMN/0204575N/1C1C: *OMN BA-1 AN/SLQ-32(V)6*	0.000	12.025	11.924	-	11.924	12.481	12.738	12.506	12.704	Continuing	Continuing

Remarks

D. Acquisition Strategy

SEWIP will develop Block upgrades to AN/SLQ-32 based on integrating technology advances and adding functional capabilities in an incremental fashion. Each Block and Sub-Block will be developed and contracted in an individual yet coordinated and overlapping fashion.

E. Performance Metrics

Successfully achieve Block 2 MS C / LRIP DR.
Successfully complete Block 2 Initial Operational Test & Evaluation (IOT&E).
Successfully achieve Block 2 Full Rate Production (FRP) DR.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3227 / *SEWIP Block 2*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 2 E&MD	C/CPIF	Lockheed Martin : Syracuse, NY	107.833	0.000		0.000		0.000		-		0.000	0.000	107.833	-
Block 2 Preliminary Development	C/CPIF	Lockheed Martin : Syracuse, NY	17.211	0.000		0.000		0.000		-		0.000	0.000	17.211	-
Block 2 SEWTT Development	SS/CPFF	EWA-GSI : Fairmont, WV	1.432	0.000		0.000		0.000		-		0.000	0.000	1.432	-
Block 2 SEWTT Development	WR	NSWC Crane : Crane, IN	0.047	0.000		0.000		0.000		-		0.000	0.000	0.047	-
		Subtotal	126.523	0.000		0.000		0.000		-		0.000	0.000	126.523	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 2 Integrated Logistics Support	WR	NSWC Crane, DD, NRL, APL : Crane, IN; Dahlgren, VA; Washington DC; Laurel, MD	1.309	0.000		0.000		0.000		-		0.000	0.000	1.309	-
Block 2 Integrated Logistics Support	WR	NSWC Crane : Crane, IN	4.246	0.000		0.000		0.000		-		0.000	0.000	4.246	-
Block 2 Government Engineering Support	WR	NSWC Crane, DD, NRL, APL : Crane, IN; Dahlgren, VA; Washington DC; Laurel, MD	14.710	0.000		0.000		0.000		-		0.000	0.000	14.710	-
Block 2 Government Engineering Support	WR	NSWC Dahlgren : Dahlgren, VA	12.036	0.000		0.000		0.000		-		0.000	0.000	12.036	-
Block 2 Government Engineering Support	WR	NSWC Crane : Crane, IN	6.372	0.000		0.000		0.000		-		0.000	0.000	6.372	-
Block 2 Government Engineering Support	WR	NRL : Washington, DC	4.314	0.000		0.000		0.000		-		0.000	0.000	4.314	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3227 / *SEWIP Block 2*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 2 Government Engineering Support	SS/CPFF	APL : Laurel, MD	5.745	0.303	Feb 2017	0.000		0.000		-		0.000	0.000	6.048	Continuing
Block 2 - Combat System Integration	SS/CPFF	Raytheon : San Diego, CA	0.250	0.000		0.000		0.000		-		0.000	0.000	0.250	-
Block 2 - MSMO Cost	WR	NSSA Norfolk : Norfolk, VA	1.431	0.000		0.000		0.000		-		0.000	0.000	1.431	-
Block 2 - Mast Study	WR	SUPSHIP : Bath, ME	0.033	0.000		0.000		0.000		-		0.000	0.000	0.033	-
Block 2 - Fleet Support	WR	NSSA SURFLANT : Norfolk, VA	0.030	0.000		0.000		0.000		-		0.000	0.000	0.030	-
Block 2 - Range Cost	WR	NUWC NEWPORT : Newport, RI	0.018	0.000		0.000		0.000		-		0.000	0.000	0.018	-
		Subtotal	50.494	0.303		0.000		0.000		-		0.000	0.000	50.797	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 2 Test Planning/T&E Events	WR	NSWC Crane, DD, NRL : Crane, IN; Dahlgren, VA; Washington DC;	2.523	0.000		0.000		0.000		-		0.000	0.000	2.523	-
Block 2 Test Planning/T&E Events	WR	NSWC Crane : Crane, IN	4.772	0.000		0.000		0.000		-		0.000	0.000	4.772	-
Block 2 Test Planning/T&E Events	WR	NSWC Dahlgren : Dahlgren, VA	4.303	0.000		0.000		0.000		-		0.000	0.000	4.303	-
Block 2 Test Planning/T&E Events	WR	NRL : Washington, DC	5.521	0.000		0.000		0.000		-		0.000	0.000	5.521	-
Block 2 Test Planning/T&E Events	WR	Surface Combat Systems Center : Wallops Island, VA	0.662	0.000		0.000		0.000		-		0.000	0.000	0.662	-
		Subtotal	17.781	0.000		0.000		0.000		-		0.000	0.000	17.781	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3227 / *SEWIP Block 2*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 2 Program Management Support	C/CPIF	SPA (SEAPORT) : Washington, DC	5.568	0.000		0.000		0.000		-		0.000	0.000	5.568	-
Block 2 Program Management Support	WR	NSWC Crane, DD, PHD, NRL : Crane, IN; Dahlgren, VA; PHD CA; Washington DC;	15.892	0.000		0.000		0.000		-		0.000	0.000	15.892	-
Block 2 Program Management Support	WR	NSWC Dahlgren : Dahlgren, VA	1.596	0.000		0.000		0.000		-		0.000	0.000	1.596	-
Block 2 Program Management Support	WR	NSWC Crane : Crane, IN	1.331	0.000		0.000		0.000		-		0.000	0.000	1.331	-
Block 2 Program Management Support	WR	NRL : Washington, DC	0.627	0.000		0.000		0.000		-		0.000	0.000	0.627	-
Block 2 Program Management Support	MIPR	Navy Post GraduateSchool : Monterey, CA	0.174	0.000		0.000		0.000		-		0.000	0.000	0.174	-
Block 2 Program Management Support	SS/CPFF	APL : Laurel, MD	1.962	0.000		0.000		0.000		-		0.000	0.000	1.962	-
Block 2 Program Management	WR	NSWC PHD : Port Hueneme, CA	0.091	0.000		0.000		0.000		-		0.000	0.000	0.091	-
Block 2 Travel	WR	NAVSEA Program Office Travel : Washington, DC	0.672	0.000		0.000		0.000		-		0.000	0.000	0.672	-
Block 2 DoD Acquisition Workforce Fund	Various	Various : Various	0.137	0.000		0.000		0.000		-		0.000	0.000	0.137	-
		Subtotal	28.050	0.000		0.000		0.000		-		0.000	0.000	28.050	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	222.848	0.303		0.000		0.000		-		0.000	0.000	223.151	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3227 / *SEWIP Block 2*

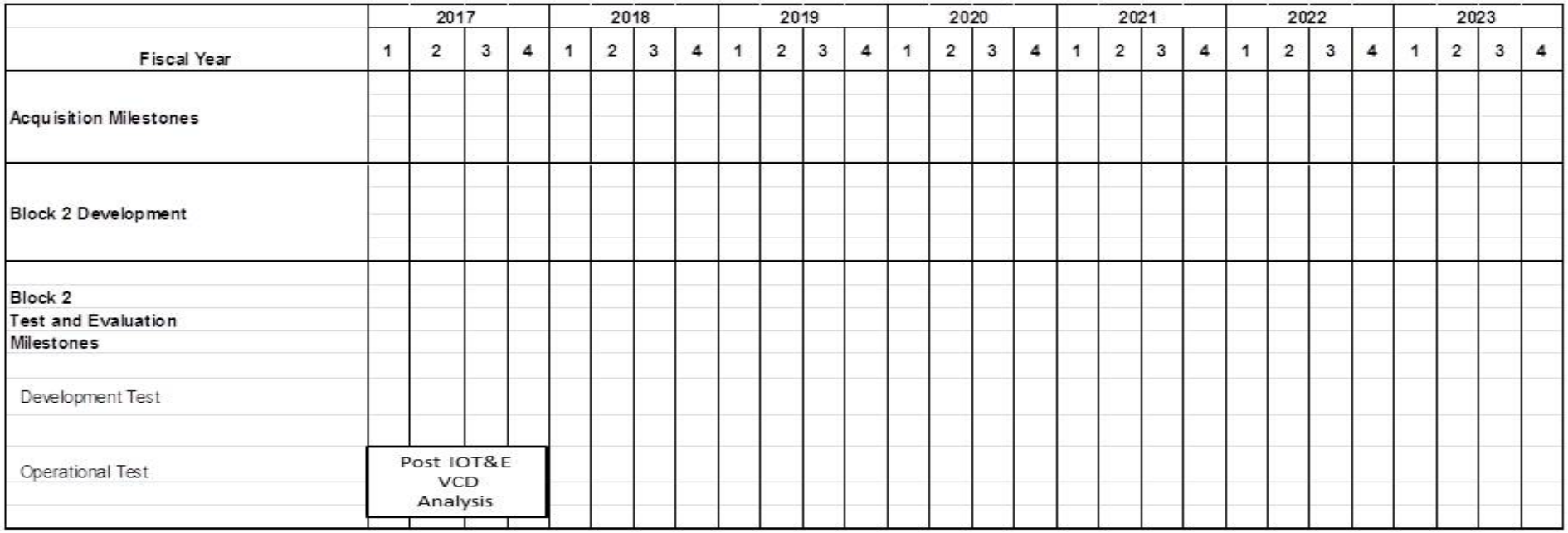


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3227 / *SEWIP Block 2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3227				
Post IOT&E VCD Analysis	1	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3316 / *Advanced Offboard EW*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3316: *Advanced Offboard EW*	125.853	27.540	45.867	64.796	-	64.796	54.073	26.105	10.561	10.983	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

3316 - The Advanced Offboard EW (AOEW) program is for the development of long duration off-board decoys integrated with onboard systems for EW coordination to counter identified EW gaps (additional details classified) in response to an urgent operational need from the Fleet that has been approved by the CNO for execution. Currently no counter to the threat exists. In FY12, the program began with a Rapid Response Effort (RRE) and a Decoy Development Effort (DDE) RRE development was completed in FY14. The RRE consisted of the evaluation and integration of commercially available decoys. The DDE consists of the development and evaluation of a long duration, active electronic offboard decoy system (payload) integrated on an existing flight vehicle (MH-60R/MH-60S), integration with ship and air systems, and a government software development effort to integrate AOEW into the Soft Kill Coordination System (SKCS) to gain maximum effectiveness from the decoy through coordination with an onboard system.

The DDE Preliminary Design contract was awarded Dec 2016 followed by a System Requirements Review (SRR)/System Functional Review (SFR) leading to a Preliminary Development Review (PDR) all in FY17. The Engineering Manufacturing and Development (EMD) Option was awarded in Sep 2017. Following the arrival of Engineering Development Model (EDMs) the Factory Qualification Test (FQT) will be completed to support development testing and NAVAIR flight certification. Initial Operational Test & Evaluation (IOT&E) is planned in FY21 to support the Full Rate Production (FRP) decision in FY22.

When the DDE Preliminary Design contract award shifted from June 2016 to Dec 2016, the EDM contract delivery requirements were re-phased to deliver the capability to the Fleet as soon as possible. MH-60R and MH-60S were originally scheduled to be integrated and flight tested in the same fiscal year (FY19), but integration and flight testing of the MH-60S has been shifted to FY21.

The funding increase in FY19 is primarily due to system integration and certification testing for two platforms. AOEW requires integration into two separate host platforms, the MH-60R/S helicopter and the ship which drives additional software and testing requirements. In FY19, there is testing for both standard shipboard certification testing (NAVSEA) as well as flight certification testing (NAVAIR) related to system integration. Further, the program will fund the development of the software Avionics Operating Program (AOP) update to the helicopter and development of Soft Kill Coordinator Subsystem (SKCS) for integration with AN/SLQ-32(V)6. Additionally, material for the first four EDMs (1-4) will be purchased in FY19. Material for the remaining two EDMs (5-6) will be purchased in FY20. The integration to two platforms, helicopter and ship, coupled with the material purchase in FY19 drives the increased funding requirement.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AOEW - Decoy Development Effort (DDE) Government Engineering	18.540	26.252	40.820	0.000	40.820
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: - Conduct Gate 6 - Conduct IBR for Engineering Material and Development - Continue interoperability analysis to ensure all system of systems are compatible - Continue tactics analysis and development - Continue integration of ship and air interfaces - Continue SKCS development and integration specific to AOEW - Continue development of AOP to update MH-60R and MH-60S software necessary for AOEW decoy and Helicopter Integration - Continue sustainment and training plan development - Continue test and M&S plan development - Support the AOEW Decoy Critical Design Review (CDR) - Conduct System of Systems CDR - Continue support for M&S development for Electronic Warfare Test Bed (EWTB) - Continue Surface Electronic Warfare Team Trainer (SEWTT) functionality development for the AOEW Decoy - Commence Engineering Data Requirements Agreement Plan (EDRAP) Development. The Engineering Data Requirements Agreement Plan (EDRAP) is the requirements document for NAVAIR Flight Certification. - Continue NAVAIR MH-60R flight certification planning - Commence development of Capabilities Production Document (CPD) - Support AOP PDR - Commence installation planning - Commence integration planning of AOEW, MH-60R, Combat Management System (CMS), Common Data Link Management System (CDLMS), SKCS, Link-16, and AOP					
FY 2019 Base Plans: - Commence MS-C planning and documentation preparation - Conduct Integrated Logistics Assessment (ILA) - Conduct Technology Readiness Assessment (TRA) - Continue interoperability analysis to ensure all system of systems are compatible - Continue tactics analysis and development - Continue integration of ship and air interfaces - Complete SKCS development specific to AOEW					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue development of AOP to update MH-60R and MH-60S software necessary for AOEW decoy and Helicopter Integration - Commence support of Trouble Report (TR) resolution for AOP software deliveries - Continue integration planning and commence testing of AOEW, MH-60R, CMS, CDLMS, SKCS, Link-16, and AOP - Continue sustainment and training plan development - Commence identification of and update of test assets needed to support Operational Testing - Continue test and M&S plan development - Continue support for M&S development for EWTB - Continue SEWTT functionality development for the AOEW Decoy - Support Factory Qualification Test (FQT) - Support Developmental Test (DT) Assist - Conduct technique verification - Conduct development testing (DT-B2 thru DT-B3b) - Conduct configuration management of Engineering Development Model (EDM) assets and baselines in support of programmatic needs - Complete EDRAP Development - Commence NAVAIR MH-60R flight certification testing of EDMs. Flight certification is a year-long test evolution required by NAVAIR to ensure Safety of Flight and to certify the interoperability between the MH-60R and the AOEW decoy. Flight certification tests include: Ground and Flight Jettison Test, Flight Test for Mission Performance / Spec Compliance Flight Test, Functional Software Test, and Decoy Fit and Egress Test - Commence NAVAIR MH-60S flight certification planning - Continue development of CPD - Conduct AEGIS integration planning to align program baselines - Commence support for Production Readiness Review (PRR) planning - Continue installation planning					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase in FY19 is primarily due to system integration and certification testing for two platforms (MH-60R helicopter and ship). System integration includes development of AOP and updates to SKCS. Certification testing includes flight testing (NAVAIR) and standard shipboard certification testing (NAVSEA).					
Title: AOEW - Decoy Development Effort (DDE) Development	9.000	19.615	23.976	0.000	23.976
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue E&MD - Commence Engineering Development Model (EDM) Hardware and Software development and integration - Support Integrated Baseline Review (IBR) for E&MD - Support System of Systems Critical Design Review (CDR) - Support integration planning of AOEW, MH-60R, CMS, CDLMS, SKCS, Link-16, and AOP - Develop AOEW emulators - Develop AOEW techniques generator - Conduct Critical Design Review (CDR) - Commence assembly of AOEW mass models for NAVAIR testing - Commence assembly of AOEW EDMs 1 and 2 - Commence MH-60 R/S helicopter software development - Procure material for mass models 1 through 4 - Support AOP to update MH-60R and MH-60S software necessary for AOEW decoy and Helicopter Integration - Support NAVAIR flight certification planning. Flight certification is a year-long test evolution required by NAVAIR to ensure Safety of Flight and to certify the interoperability between the MH-60S and the AOEW decoy. Flight certification tests include: Ground and Flight Jettison Test, Flight Test for Mission Performance / Spec Compliance Flight Test, Functional Software Test, and Decoy Fit and Egress Test - Support battery certification					
FY 2019 Base Plans: - Continue E&MD - Complete EDM Hardware and Software development and integration - Conduct Factory Qualification Test (FQT) of EDMs 1 and 2 - Conduct Developmental Test (DT) Assist - Support integration planning and testing of AOEW, MH-60R, CMS, CDLMS, SKCS, Link-16, and AOP - Procure material for EDMs 1 through 4					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Procure material for mass models 5 through 7 - Support NAVAIR flight certification testing. Flight certification is a year-long test evolution required by NAVAIR to ensure Safety of Flight and to certify the interoperability between the MH-60S and the AOEW decoy - Continue support of battery certification - Commence Production Readiness Review (PRR) planning - Commence delivery of AOEW mass models for NAVAIR testing - Commence delivery of AOEW EDMs - Support AOP to update MH-60R and MH-60S software necessary for AOEW decoy and Helicopter Integration ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY19 is primarily due to the procurement of material for EDMs and mass models.					
Accomplishments/Planned Programs Subtotals	27.540	45.867	64.796	0.000	64.796

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OMN/12CR0 (1C2C): *SLQ-59, SLQ-62, and MK-59 Decoy Launching Systems*	3.368	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• OMN/11CD0 (1C1C): *SLQ-59, SLQ-62, and MK-59 Decoy Launching Systems*	0.000	3.398	3.293	-	3.293	3.374	3.382	2.745	3.027	Continuing	Continuing
• OPN/5231: *Ship Missile Support Equipment*	0.000	0.000	0.000	-	0.000	0.000	6.068	35.998	35.589	Continuing	Continuing

Remarks

OPN Controls reflect the following Line Item 5231 Project Unit (PU) under the 'ANTI-SHIP MISSILE DECOY SYSTEM' program: VV500.

D. Acquisition Strategy

The AOEW DDE decoy is being competitively contracted and developed, and builds on technologies and concepts currently in development by ONR.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*

E. Performance Metrics

For DDE:
Achieve Milestone (MS) B
Award Preliminary Design/E&MD contract.
Conduct System Requirements Review (SRR)
Conduct System Functional Review (SFR)
Conduct Preliminary Design Review (PDR)
Conduct Critical Design Review (CDR)
Achieve Milestone (MS) C
Conduct Initial Operational Test and Evaluation (IOT&E)
Conduct Developmental Test (DT) Assist
Conduct DDE Test and Certification
Conduct Full Rate Production (FRP)/Decision Review (DR)

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Analysis of Alternatives	WR	CNA : Alexandria, VA	1.300	0.000		0.000		0.000		-		0.000	0.000	1.300	Continuing
Concept Analysis and Integration Assessment	SS/CPFF	APL : Laurel, MD	10.667	1.040	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Concept Analysis and Technology Studies	WR	MIT-LL : Boston, MA	3.780	1.077	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Concept Development and Technology Studies	WR	NRL : Washington, D.C.	24.867	0.989	May 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technology Development and Systems Requirements	WR	NSWC Dahlgren : Dahlgren, VA	12.364	1.610	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Requirements and Integration Studies	WR	NSWC Crane : Crane, IN	2.233	0.000		0.000		0.000		-		0.000	0.000	2.233	Continuing
DDE Avionics Development	WR	NAVAIR : Patuxent River, MD	2.791	0.402	Nov 2016	2.750	Nov 2017	6.810	Nov 2018	-		6.810	Continuing	Continuing	Continuing
RRE Hardware Development	C/CPIF	Airborne Systems : UK	8.364	0.000		0.000		0.000		-		0.000	0.000	8.364	Continuing
DDE Preliminary Design/ E&MD	C/CPIF	Lockheed Martin : Syracuse, NY	0.000	9.000	Nov 2016	19.615	Nov 2017	23.976	Nov 2018	-		23.976	Continuing	Continuing	Continuing
Ship Integration	WR	SPAWAR : San Diego, CA	0.400	1.360	Nov 2016	1.070	Jan 2018	0.000		-		0.000	0.000	2.830	-
		Subtotal	66.766	15.478		23.435		30.786		-		30.786	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Development Support	WR	NRL : Washington, DC	8.121	1.040	May 2017	4.515	Nov 2017	5.863	Nov 2018	-		5.863	Continuing	Continuing	Continuing
Government Development and Engineering Support	WR	NSWC Dahlgren : Dahlgren, VA	6.575	2.160	Nov 2016	4.635	Nov 2017	6.553	Nov 2018	-		6.553	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3316 / *Advanced Offboard EW*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NSWC Crane : Crane, IN	9.180	2.150	Nov 2016	3.018	Nov 2017	3.829	Nov 2018	-		3.829	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC Carderock : Bethesda, MD	0.743	0.025	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering Support	SS/CPFF	APL : Laurel, MD	1.251	2.492	Nov 2016	3.179	Nov 2017	4.147	Nov 2018	-		4.147	Continuing	Continuing	Continuing
Government Development Support	WR	NAVAIR : Patuxent River, MD	2.525	0.828	Nov 2016	2.000	Nov 2017	2.743	Nov 2018	-		2.743	Continuing	Continuing	Continuing
Logistics/Training	C/CPFF	Pioneering Evolution : Arlington, VA	0.166	0.000		0.000		0.000		-		0.000	0.000	0.166	-
RRE Installation	WR	Planning Yard : Yokosuka, Japan	0.034	0.000		0.000		0.000		-		0.000	0.000	0.034	-
RRE Installation	SS/CPFF	Planning Yard : Bath, ME	4.275	0.000		0.000		0.000		-		0.000	0.000	4.275	-
EW UON	WR	Cherry Point Army : Aberdeen Proving Ground, MD	0.022	0.000		0.000		0.000		-		0.000	0.000	0.022	-
EW UON	WR	Cherry Point Navy : Cherry Point, NC	0.148	0.000		0.000		0.000		-		0.000	0.000	0.148	-
EW UON	WR	NSWC Indian Head : Indian Head, MD	0.050	0.000		0.000		0.000		-		0.000	0.000	0.050	-
EW UON	WR	NSSA Norfolk : Norfolk, VA	0.070	0.000		0.000		0.000		-		0.000	0.000	0.070	-
RRE Installation	WR	Norfolk Naval Shipyard : Norfolk, VA	2.064	0.000		0.000		0.000		-		0.000	0.000	2.064	-
RRE Installation	WR	Det-Naples : Naples, Italy	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Logistics/Training	SS/CPFF	EWA : Fairmont, WV	0.767	0.000		0.000		0.000		-		0.000	0.000	0.767	-
RRE Installation	WR	FLC ROTA : Rota, Spain	0.055	0.000		0.000		0.000		-		0.000	0.000	0.055	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support	WR	MIT-LL : Boston, MA	0.000	0.000		0.800	Nov 2017	0.720	Nov 2018	-		0.720	0.000	1.520	-
Program Management Support	WR	DISA : Pensacola, FL	0.000	0.055	Sep 2017	0.000		0.000		-		0.000	0.000	0.055	-
		Subtotal	36.546	8.750		18.147		23.855		-		23.855	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Planning and Development Testing	WR	NRL : Washington, DC	3.819	0.329	May 2017	0.339	Nov 2017	0.750	Nov 2018	-		0.750	Continuing	Continuing	Continuing
Test Planning and Development Testing	WR	NSWC/Dahlgren : Dahlgren, VA	2.992	0.221	Nov 2016	0.327	Nov 2017	0.359	Nov 2018	-		0.359	Continuing	Continuing	Continuing
Test Planning and Development Testing	WR	NSWC Crane : Crane, IN	1.153	0.086	Nov 2016	0.169	Nov 2017	0.150	Nov 2018	-		0.150	Continuing	Continuing	Continuing
Test Planning and Development Testing	WR	NAVAIR : Patuxent River, MD	0.373	0.116	Nov 2016	0.500	Nov 2017	6.760	Nov 2018	-		6.760	Continuing	Continuing	Continuing
Test Planning and Development Testing	WR	OPTEVFOR : Norfolk, VA	0.330	0.264	Nov 2016	0.305	Jan 2018	0.305	Nov 2018	-		0.305	Continuing	Continuing	Continuing
Test and Evaluation	WR	Navy Post Graduate School : Monterey, CA	0.090	0.000		0.000		0.000		-		0.000	0.000	0.090	-
EW UON Test and Evaluation	C/FPAF	SRF Rota : Rota, Spain	1.728	0.000		0.000		0.000		-		0.000	0.000	1.728	-
EW UON Test and Evaluation	WR	NSSA Norfolk : Norfolk, VA	0.018	0.000		0.000		0.000		-		0.000	0.000	0.018	-
EW UON Test and Evaluation	WR	SUPSHIP Bath : Bath, ME	1.166	0.000		0.000		0.000		-		0.000	0.000	1.166	-
		Subtotal	11.669	1.016		1.640		8.324		-		8.324	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*

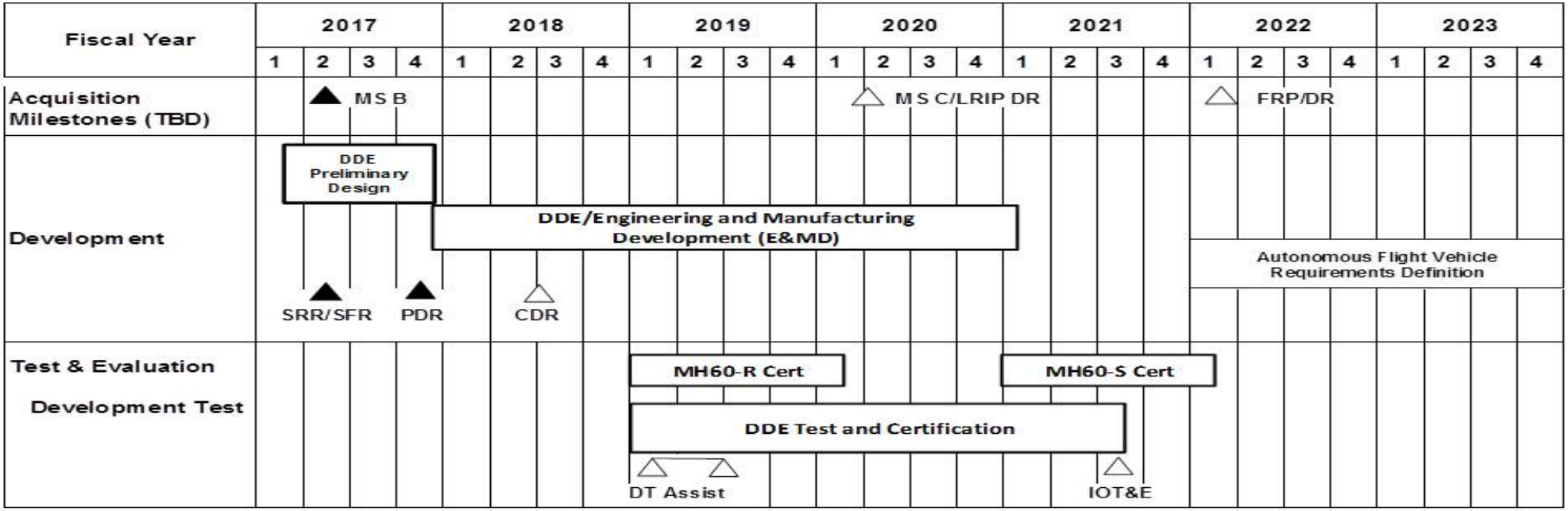
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	CSC (SEAPORT) : Washington, DC	0.315	0.000		0.000		0.000		-		0.000	0.000	0.315	-
Program Management Support	C/CPIF	CACI (SEAPORT) : Washington, DC	0.355	0.503	Nov 2016	0.477	Jan 2018	0.350	Nov 2018	-		0.350	0.000	1.685	-
Program Management Support	C/CPIF	SPA (SEAPORT) : Washington, DC	7.866	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support	SS/CPIF	SPA (BRIDGE) : Washington, DC	1.330	0.334	Nov 2016	0.000		0.000		-		0.000	0.000	1.664	-
Program Management Support	C/CPIF	SPA : Washington, DC	0.028	0.793	Aug 2017	1.484	Jan 2018	1.000	Nov 2018	-		1.000	0.000	3.305	-
Program Management Support	C/CPIF	TMB (SEAPORT) : Washington, DC	0.878	0.525	Nov 2016	0.573	Jan 2018	0.411	Nov 2018	-		0.411	0.000	2.387	-
Program Management Support	C/CPIF	STRATEGIC INSIGHT (SEAPORT) : Washington, DC	0.000	0.041	Mar 2017	0.041	Jan 2018	0.000		-		0.000	0.000	0.082	-
Travel	WR	NAVSEA Program Office Travel : Washington, DC	0.100	0.100	Nov 2016	0.070	Jan 2018	0.070	Nov 2018	-		0.070	Continuing	Continuing	Continuing
		Subtotal	10.872	2.296		2.645		1.831		-		1.831	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	125.853	27.540		45.867		64.796		-		64.796	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*



DDE: Decoy Development Effort

FRP/DR: Full Rate Production/Decision Review

NOTE: MH60-R and MH60-S Flight Cert Split

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3316 / *Advanced Offboard EW*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3316				
DDE Preliminary Design	1	2017	4	2017
Milestone (MS) B	2	2017	2	2017
System Requirements Review (SRR)	2	2017	2	2017
System Functional Review (SFR)	2	2017	2	2017
Preliminary Design Review (PDR)	4	2017	4	2017
DDE / E&MD	4	2017	1	2021
Critical Design Review (CDR)	3	2018	3	2018
Developmental Test (DT) Assist	1	2019	2	2019
MH60-R Certification	1	2019	1	2020
DDE Test and Certification	1	2019	3	2021
Milestone (MS) C / LRIP DR	2	2020	2	2020
MH60-S Certification	1	2021	1	2022
Initial Operational Test and Evaluation (IOT&E)	3	2021	3	2021
Full Rate Production (FRP) / Decision Review (DR)	1	2022	1	2022
Autonomous Flight Vehicle Requirements Definition	1	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3321 / *SEWIP Block 3*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3321: *SEWIP Block 3*	351.154	68.172	37.330	35.901	-	35.901	21.696	23.228	7.015	7.366	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

SEWIP Block 3 is developing an Electronic Attack (EA) capability improvement required for the AN/SLQ-32(V) system to keep pace with the threat. SEWIP Block 3 will provide the AN/SLQ-32(V)7 system for all surface ships (CVN, DDG, LHD) outfitted with the active variant of the AN/SLQ-32, mainly the (V)3 and (V)4, as well as select new construction platforms.

The SEWIP Block 3 Acquisition leverages technology developed under the Office of Naval Research's (ONR) Integrated Topside (InTop) Science and Technology (S&T) effort. SEWIP Block 3 will continue to expand the integrated shipboard combat system by providing a new integrated EA transmitter, array, and associated EA techniques. The AN/SLQ-32(V)7 integrates the new EA countermeasure (SEWIP Block 3) with the AN/SLQ-32(V)6. The AN/SLQ-32(V)6 includes an Electronic Support(ES) receiver (SEWIP Block 2), a High Gain High Sensitivity (HGHS) receiver (SEWIP Block 1B3), a Specific Emitter Identifier (SEI) receiver (SEWIP Block 1B2), display console, and backend electronics. SEWIP Block 3 includes a government software development and integration effort for a SoftKill Coordinator (SKC) to manage EA engagements. SEWIP Block 3 is developing an Electronic Warfare Test Bed (EWTB) to validate system performance.

SEWIP Block 3 developed and deployed a limited interim capability, starting in 2014, of a focused application of the Naval Research Lab (NRL) Transportable EW Module (TEWM) systems to support CNO Urgent Operational Needs (UON). Block 3T (AN/SLQ-59) is the TEWM system supporting the 7th fleet UON. TEWM Speed to Fleet (STF) (AN/SLQ-62) is the TEWM system supporting the 6th fleet UON. A capability enhancement upgrade for the AN/SLQ-62 was developed in FY2017.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SEWIP Block 3 Government Engineering	6.959	11.993	20.377	0.000	20.377
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue supporting Engineering Development Model (EDM) hardware and software development and integration. - Commence preparations and conduct Milestone C. - Commence support of Formal Qualification Testing (FQT). - Conduct DT Assist. - Commence test planning for Initial Operational Test & Evaluation (IOT&E). - Continue implementation of Wallops Island test facilities and improvements (includes power handling upgrades, cooling infrastructure, antenna mounting platform, cabling, connections, security fencing).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3321 / *SEWIP Block 3*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue procurement of special test equipment (includes Combat Electromagnetic Environment Simulator, Techniques Generator, command and control test trailer, and referee receiver). - Continue the EWTB model development and verification/validation of model performance. - Continue integrated topside design activities with DDGs. - Commence planning and development of training curriculum. - Support platform integration activities to ensure compatibility with AEGIS Combat Systems. - Support to SKC software integration for EA functionality builds (2-7). - Support Production Readiness Review (PRR). - Conduct Delta Integrated Baseline Review (IBR) FY18 Government Engineering funding decreased based on refinement of FY18 estimates and to cover increased SEWIP Block 3 development cost. ***FY 2019 Base Plans:*** - Complete supporting Engineering Development Model (EDM) hardware and software development and integration; accept EDM. - Complete support of FQT. - Commence Land Based test events at Wallops. - Continue EWTB model development and verification/validation of model performance. - Continue integrated topside design activities with DDGs. Resume platform integration studies for large deck installations with (CVN/LHDs). - Continue test planning for IOT&E. - Continue planning & development of training curriculum. - Continue to support platform integration activities to ensure compatibility with Aegis Combat Systems. Resume integration studies for SSDS Combat Systems. - Support System Verification Review/Functional Configuration Audit (SVR/FCA). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Increase in FY19 is due to the planning and conduct of Government testing of the Engineering Development Model (EDM) at Wallops Land Based Testing facility.					
Title: SEWIP Block 3 Development	60.963	25.337	15.524	0.000	15.524

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3321 / *SEWIP Block 3*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue EDM hardware and software development and integration. - Commence FQT. - Support DT Assist - Continue integrated topside design activities with DDGs. - Continue support for model and simulation development for EWTB. - Continue platform integration activities to ensure compatibility with AEGIS Combat Systems. - Commence Surface Electronic Warfare Team Trainer (SEWTT) EA functionality development for AN/SLQ-32(V)7. - Conduct PRR - Support Delta IBR Note: FY18 SEWIP Block 3 Development funding increased due to additional effort for system design (antenna, cooling, power)and higher than anticipated material cost. ***FY 2019 Base Plans:*** - Complete EDM hardware and software development and integration. - Complete FQT. - Support Land Based test events at Wallops. - Continue support for model and simulation development for EWTB. - Continue integrated topside design activities with DDGs. - Continue platform integration activities to ensure compatibility with Aegis Combat Systems. - Resume platform integration studies for large deck installations (CVN/LHD) and SSDS combat system. - Continue Surface Electronic Warfare Team Trainer (SEWTT) EA functionality development for AN/SLQ-32(V). - Conduct SVR/FCA. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Decrease in FY19 is due to the completion of E&MD in Q2 FY19.					
Title: Transportable EW Module (TEWM) Speed To Fleet (STF) (AN/SLQ-62) Development	0.200	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3321 / *SEWIP Block 3*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Title: TEWM Speed to Fleet (STF) (AN/SLQ-62) Systems Engineering	0.050	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Accomplishments/Planned Programs Subtotals	68.172	37.330	35.901	0.000	35.901

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2312: *AN/SLQ-32*	244.001	240.433	420.344	-	420.344	554.399	693.782	498.954	478.252	1,262.099	5,175.418

Remarks

D. Acquisition Strategy

SEWIP will develop block upgrades to SLQ-32 based on integrating technology advances and adding functional capabilities in an incremental fashion. Each block and sub-block will be developed and contracted in an individual yet coordinated and overlapping fashion. Specifically, SEWIP Block 3 involves the transitioning and

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3321 / *SEWIP Block 3*

leveraging of work performed under the Integrated Topside (INTOP) program sponsored by ONR, which focused on designing/architecting an integrated Electronic Attack (EA), Information Operations (IO), and Line of Site (LOS) Comms system for Naval Surface Platforms. SEWIP Block 3 also leverages work performed under the TEWM program that is sponsored by NRL that focuses on technique development and active engagement analysis/modeling for Naval surface combatants. TEWM includes Block 3T (AN/SLQ-59) system supporting the 7th fleet UON and TEWM STF (AN/SLQ-62) system supporting the 6th fleet UON.

E. Performance Metrics

Achieve Block 3 Milestone (MS) B.
Complete Block 3T and Speed to Fleet (STF) development.
Complete Block 3T and STF integration and testing.
Award Preliminary Design Contract.
Conduct Delta CDR.
Achieve Block 3 Long Lead Material (LLM) Authorization.
Complete Engineering & Manufacturing Development (E&MD).
Complete TEWM Speed To Fleet (STF) AN/SLQ-62 Upgrade.
Complete DT Assist.
Complete Production Readiness Review (PRR).
Achieve Block 3 MS C / Low Rate Initial Production (LRIP) Decision Review (DR).
Complete Formal Qualification Test (FQT).
Complete System Verification Review/Functional Configuration Audit (SVR/FCA)
Complete Test Readiness Review (TRR).
Complete TECHEVAL.
Complete Initial Operational Test & Evaluation (IOT&E).
Achieve Block 3 Full Rate Production (FRP) DR.
Complete Follow-on Operational Test & Evaluation (FOT&E).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3321 / *SEWIP Block 3*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 3 Technology Demonstration	C/CPFF	Northrop Grumman: Linthicum, MD : Raytheon: Tewksbury, MA	37.195	0.000		0.000		0.000		-		0.000	0.000	37.195	-
Block 3T Primary Hardware Development	C/CPFF	ITT Exelis : Alexandria, VA	54.624	0.000		0.000		0.000		-		0.000	0.000	54.624	-
Block 3 SEWTT Development	SS/CPFF	EWA-GSI : Fairmont, WV	1.619	0.000		0.200	Mar 2018	0.200	Nov 2018	-		0.200	Continuing	Continuing	Continuing
TEWM STF Primary Hardware Development	WR	NRL : Washington, DC	7.691	0.200	Nov 2016	0.000		0.000		-		0.000	0.000	7.891	-
Block 3 Preliminary Design/E&MD	C/CPIF	Northrop Grumman : Baltimore, MD	75.077	60.963	Oct 2016	25.137	Oct 2017	15.324	Oct 2018	-		15.324	Continuing	Continuing	Continuing
		Subtotal	176.206	61.163		25.337		15.524		-		15.524	Continuing	Continuing	N/A

Remarks

FY17 system development increase due to antenna design complexity and higher volume and cost of materials than originally planned.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 3 Integrated Logistics Support	WR	NSWC Crane : Crane, IN	9.252	0.300	Oct 2016	1.176	Nov 2017	2.750	Nov 2018	-		2.750	Continuing	Continuing	Continuing
Block 3 Integrated Logistics Support	WR	NSWC Carderock : Bethesda, MD	0.165	0.000		0.000		0.000		-		0.000	0.000	0.165	-
Block 3 Integrated Logistics Support	WR	NSWC Corona : Corona, CA	0.000	0.000		0.059	Nov 2017	0.000		-		0.000	0.000	0.059	-
Block 3 Integrated Logistics Support	WR	NAVSEALOGCEN : Mechanicsburg, PA	0.181	0.093	Jul 2017	0.248	Mar 2018	0.216	Nov 2018	-		0.216	Continuing	Continuing	Continuing
Block 3 Government Engineering Support	WR	NSWC Dahlgren : Dahlgren, VA	21.402	0.680	Oct 2016	0.629	Nov 2017	1.000	Nov 2018	-		1.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3321 / *SEWIP Block 3*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 3 Government Engineering Support	WR	NSWC Crane : Crane, IN	7.523	0.459	Nov 2016	1.440	Nov 2017	1.000	Nov 2018	-		1.000	Continuing	Continuing	Continuing
Block 3 Government Engineering Support	WR	NRL : Washington, DC	18.780	1.097	Nov 2016	0.950	Nov 2017	1.500	Nov 2018	-		1.500	Continuing	Continuing	Continuing
Block 3 Government Engineering Support	SS/CPFF	APL : Laurel, MD	23.237	0.721	Nov 2016	0.516	Mar 2018	1.000	Nov 2018	-		1.000	Continuing	Continuing	Continuing
Block 3 Government Engineering Support	WR	MIT-LL : Cambridge, MA	4.794	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Block 3 Government Engineering Support	WR	GTRI : Atlanta, GA	1.040	0.000		0.000		0.000		-		0.000	0.000	1.040	-
Block 3 Feasibility Studies	WR	BIW : Bath, ME	0.249	0.261	Jan 2017	0.000		0.000		-		0.000	0.000	0.510	-
Block 3 Platform Integration Studies	WR	Norfolk Naval Shipyard (NNSY) : Norfolk, VA	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	-
Block 3 Platform Integration Studies	WR	SUPSHIP Gulf Coast : Pascagoula, MS	0.062	0.000		0.000		0.000		-		0.000	0.000	0.062	-
Block 3 Platform Integration Studies	WR	NSWC Philadelphia : Philadelphia, PA	0.033	0.106	Apr 2017	0.157	Mar 2018	0.245	Nov 2018	-		0.245	0.000	0.541	-
Block 3 Platform Integration Studies	WR	NAVSEA 05 (Alion) : Washington, DC	0.297	0.000		0.000		0.000		-		0.000	0.000	0.297	-
Block 3 Platform Integration Studies	WR	NAVSEA 05 (CSRA) : Washington, DC	0.149	0.000		0.000		0.000		-		0.000	0.000	0.149	-
Block 3 Platform Integration Studies	WR	Lockheed Martin : Moorstown, NJ	0.000	0.202	Jan 2017	0.000		0.000		-		0.000	0.000	0.202	-
Block 3T Systems Engineering	WR	NRL : Washington, DC	20.532	0.000		0.000		0.000		-		0.000	0.000	20.532	-
TEWM STF Systems Engineering	WR	NRL : Washington, DC	5.691	0.050	Nov 2016	0.000		0.000		-		0.000	0.000	5.741	-
TEWM STF Systems Engineering	WR	NSWC Crane : Crane, IN	0.329	0.000		0.000		0.000		-		0.000	0.000	0.329	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	Project (Number/Name) 3321 / *SEWIP Block 3*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	113.756	3.969		5.175		7.711		-		7.711	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 3 Test Planning/T&E Events	WR	NSWC Dahlgren : Dahlgren, VA	3.894	0.300	Jan 2017	0.170	Nov 2017	2.000	Nov 2018	-		2.000	Continuing	Continuing	Continuing
Block 3 Test Planning/T&E Events	WR	NSWC Crane : Crane, IN	2.311	0.280	Jan 2017	0.363	Mar 2018	1.316	Nov 2018	-		1.316	Continuing	Continuing	Continuing
Block 3 Test Planning/T&E Events	WR	NRL : Washington, DC	9.368	0.640	Jan 2017	3.130	Nov 2017	4.000	Nov 2018	-		4.000	Continuing	Continuing	Continuing
Block 3 Test Planning/T&E Events	SS/CPFF	APL : Laurel, MD	0.350	0.399	Jan 2017	1.115	Nov 2017	2.000	Nov 2018	-		2.000	Continuing	Continuing	Continuing
Block 3 Test Planning/T&E Events	WR	COMOPTEVFOR : Norfolk, VA	0.165	0.011	Jan 2017	0.189	Mar 2018	0.333	Nov 2018	-		0.333	Continuing	Continuing	Continuing
Block 3 Test Planning/T&E Events	WR	Surface Combat Systems Center : Wallops Island, VA	0.000	0.356	Oct 2016	0.000		1.775	Nov 2018	-		1.775	0.000	2.131	-
NAVFAC	WR	NAVFAC Mid-Atlantic : Norfolk, VA	0.000	0.167	May 2017	0.596	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
TEWM Testing	WR	NRL : Washington, DC	10.641	0.000		0.000		0.000		-		0.000	0.000	10.641	-
TEWM STF Testing	WR	NRL : Washington, DC	4.199	0.000	May 2017	0.000		0.000		-		0.000	0.000	4.199	-
		Subtotal	30.928	2.153		5.563		11.424		-		11.424	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3321 / *SEWIP Block 3*

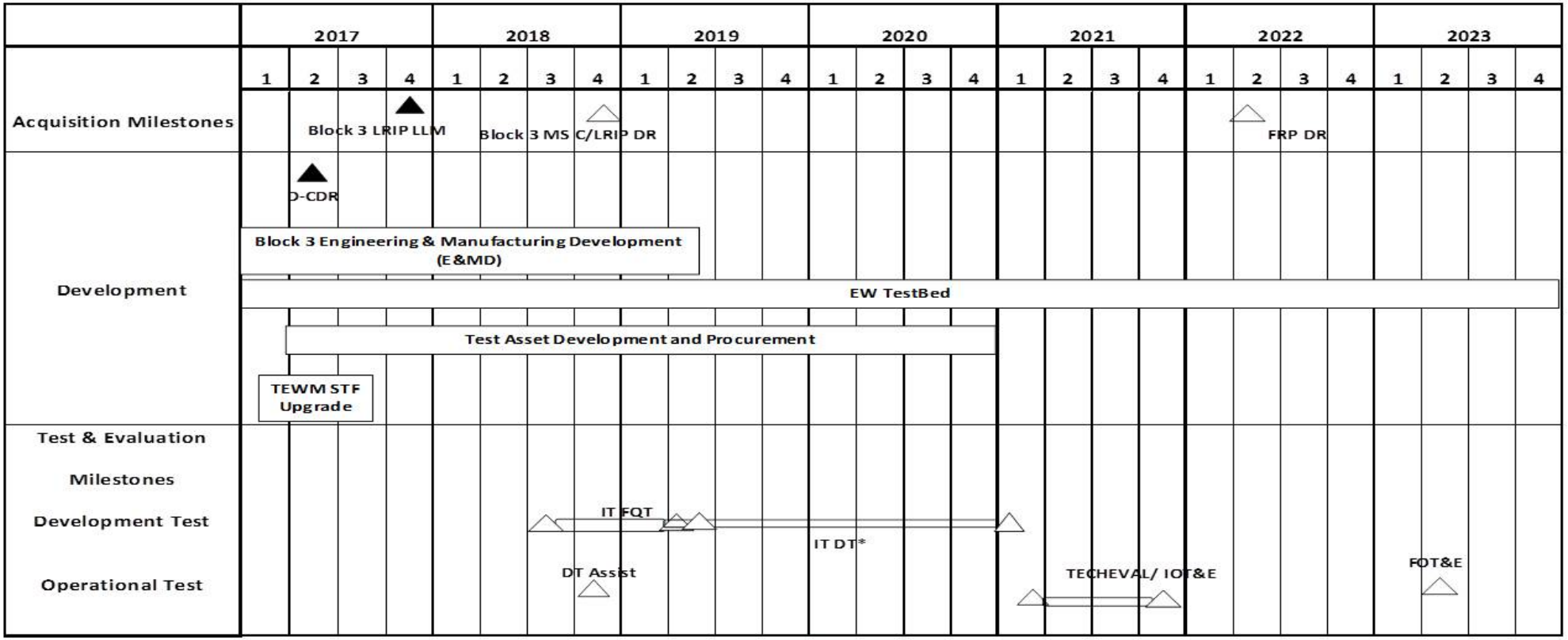
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Block 3 Program Management Support	C/CPIF	SPA (SEAPORT) : Washington, DC	18.883	0.000		0.000		0.000		-		0.000	0.000	18.883	-
Block 3 Program Management Support	C/CPIF	TMB (SEAPORT) : Washington, DC	0.970	0.421	Jan 2017	0.230	Feb 2018	0.235	Nov 2018	-		0.235	Continuing	Continuing	Continuing
Block 3 Program Management Support	C/CPIF	CACI (SEAPORT) : Washington, DC	0.422	0.000	Jan 2017	0.086	Feb 2018	0.088	Nov 2018	-		0.088	Continuing	Continuing	Continuing
Block 3 Program Management Support	C/CPIF	Strategic Insight (SEAPORT) : Washington, DC	0.044	0.000		0.000		0.000		-		0.000	0.000	0.044	-
Block 3 Program Management Support	SS/CPIF	SPA (BRIDGE) : Washington, DC	1.138	0.188	Dec 2016	0.000		0.000		-		0.000	0.000	1.326	-
Block 3 Program Management Support	C/CPIF	SPA : Washington, DC	0.000	0.074	Aug 2017	0.432	Feb 2018	0.442	Nov 2018	-		0.442	Continuing	Continuing	Continuing
Block 3 Program Management Support	WR	NSWC Dahlgren : Dahlgren, VA	4.151	0.063	Jan 2017	0.060	Nov 2017	0.057	Nov 2018	-		0.057	Continuing	Continuing	Continuing
Block 3 Travel	WR	NAVSEA Program Office : Washington, DC	0.332	0.015	Jan 2017	0.065	Feb 2018	0.080	Nov 2018	-		0.080	Continuing	Continuing	Continuing
Block 3 Program Management Support	WR	NRL : Washington, DC	1.982	0.063	Jan 2017	0.061	Nov 2017	0.057	Nov 2018	-		0.057	Continuing	Continuing	Continuing
Block 3 Program Management Support	WR	DISA : Pensacola, FL	0.667	0.000		0.261	Mar 2018	0.226	Nov 2018	-		0.226	0.000	1.154	-
Block 3 Program Management Support	WR	NSWC Crane : Crane, IN	1.675	0.063	Jan 2017	0.060	Nov 2017	0.057	Nov 2018	-		0.057	Continuing	Continuing	Continuing
		Subtotal	30.264	0.887		1.255		1.242		-		1.242	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	351.154	68.172		37.330		35.901		-		35.901	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3321 / *SEWIP Block 3*



* Includes the folowing test events: : Land Test-Block 3 Stand-Alone Operation, Flight Test-Threat Engagements (over water), IA / Maint Demo (Dry Run), CMS Integration (Aegis), DDG-51 Combat System Certification (Aegis Integration), Environment, EMI, RCS, and Shock Tests

** TECHEVAL and IOT&E shifted to align testing with combat system certification process

Acronyms: D-CDR - Delta CDR; DR-Decision Review; DT-Developmental Test; EDM - Engineering Development Modle; FOT&E-Follow-on Operational Test & Evaluation; FQT-Formal Qualification Testing; FRP-Full Rate Production; HWQT-Hardware Qualification Testing; IOT&E-Initial Operational Test & Evaluation; IT-Integrated Testing; LLM-Long Lead Material; LRIP-Low Rate Initial Production; MS-Milestone; OA-Operational Assessment; STF-Speed To Fleet; TEWM-Transportable EW Module; TRR-Test Readiness Review

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604757N / *Ship Self Def (Engage: Soft Kill/EW)*	**Project (Number/Name)** 3321 / *SEWIP Block 3*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3321.L24				
Block 3 Engineering and Manufacturing Development (E&MD)	1	2017	2	2019
EW Testbed	1	2017	4	2023
TEWM Speed to Fleet Upgrade	1	2017	3	2017
Test Asset Development and Procurement	2	2017	4	2020
Delta CDR	2	2017	2	2017
Block 3 LRIP LLM	4	2017	4	2017
IT-FQT	3	2018	2	2019
DT Assist	4	2018	4	2018
Block 3 MS C/LRIP DR	4	2018	4	2018
IT-DT	2	2019	1	2021
Block 3 TECHEVAL and IOT&E	1	2021	4	2021
Block 3 FRP DR	2	2022	2	2022
Block 3 FOT&E	2	2023	2	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604761N *I Intelligence Engineering*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	2.053	9.029	34.855	29.715	-	29.715	27.980	28.187	28.787	29.376	Continuing	Continuing
3103: *Intelligence Engineering*	2.053	9.029	4.355	4.150	-	4.150	4.209	4.296	4.503	4.595	Continuing	Continuing
3419: *Technical Algorithm Development*	0.000	0.000	19.400	17.965	-	17.965	18.046	18.159	18.542	18.923	Continuing	Continuing
3421: *Non-Kinetic Countermeasure Support*	0.000	0.000	11.100	7.600	-	7.600	5.725	5.732	5.742	5.858	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET//NOFORN and are submitted annually to Congress in the classified budget justification books.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	13.029	34.855	32.122	-	32.122
Current President's Budget	9.029	34.855	29.715	-	29.715
Total Adjustments	-4.000	0.000	-2.407	-	-2.407
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	-2.000	0.000	0.000	-	0.000
• Rate/Misc Adjustments	0.000	0.000	-2.407	-	-2.407
• Congressional Directed Reductions Adjustments	-2.000	-	-	-	-

Change Summary Explanation

The details of this program element are classified SECRET//NOFORN and are submitted annually to Congress in the classified budget justification books.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604761N / *Intelligence Engineering*	Project (Number/Name) 3103 / *Intelligence Engineering*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3103: *Intelligence Engineering*	2.053	9.029	4.355	4.150	-	4.150	4.209	4.296	4.503	4.595	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET//NOFORN and are submitted annually to Congress in the classified budget justification books.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604761N / *Intelligence Engineering*				Project (Number/Name) 3419 / *Technical Algorithm Development*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3419: *Technical Algorithm Development*	0.000	0.000	19.400	17.965	-	17.965	18.046	18.159	18.542	18.923	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET//NOFORN and are submitted annually to Congress in the classified budget justification books.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604761N / *Intelligence Engineering*				Project (Number/Name) 3421 / *Non-Kinetic Countermeasure Support*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3421: *Non-Kinetic Countermeasure Support*	0.000	0.000	11.100	7.600	-	7.600	5.725	5.732	5.742	5.858	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET//NOFORN and are submitted annually to Congress in the classified budget justification books.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604771N *I Medical Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	139.490	24.510	9.353	8.095	-	8.095	8.214	9.067	9.291	9.520	Continuing	Continuing
0000: *UNDIST*	0.000	6.208	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.208
0933: *Medical/Dental Equipment Dev*	22.664	2.812	9.353	8.095	-	8.095	8.214	9.067	9.291	9.520	Continuing	Continuing
2896: *Military Dental Research*	0.000	0.015	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.015
9999: *Congressional Adds*	116.826	15.475	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	132.301

A. Mission Description and Budget Item Justification

The purpose of this program is to develop biomedical equipment and related techniques to reduce morbidity; to enhance the logistic feasibility of modern medical care for combat casualties; to sustain casualties for evacuation to fixed medical facilities for definitive care; and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firm/industry participation in the projects.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	9.221	9.353	9.613	-	9.613
Current President's Budget	24.510	9.353	8.095	-	8.095
Total Adjustments	15.289	0.000	-1.518	-	-1.518
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.710	0.000			
• Program Adjustments	-0.001	0.000	-1.160	-	-1.160
• Rate/Misc Adjustments	0.000	0.000	-0.358	-	-0.358
• Congressional Add Adjustments	16.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Military Dental Research*	5.803	0.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604771N *I Medical Development*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Congressional Add: *Wound Care Research (transferred from Defense Health Program)*	9.672	0.000
Congressional Add Subtotals for Project: 9999	15.475	0.000
Congressional Add Totals for all Projects	15.475	0.000

Change Summary Explanation

The funding decrease in FY19 reflects a slower development of projects.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*	Project (Number/Name) 0000 / *UNDIST*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0000: *UNDIST*	0.000	6.208	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.208
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 17 funding reflected in this project is erroneous due to a database error. This funding should be reflected in Project 0933.

A. Mission Description and Budget Item Justification

The purpose of this program is to develop biomedical equipment and related techniques to reduce morbidity; to enhance the logistic feasibility of modern medical care for combat casualties; to sustain casualties for evacuation to fixed medical facilities for definitive care; and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms/industry participation in the projects.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Medical/Dental Equipment Development	6.208	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	6.208	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 0000 / *UNDIST*

D. Acquisition Strategy

The major Product Areas in the Medical Development Program are: 1) Equipment, 2) Pharmaceuticals/Biologics, and 3) Operational Knowledge/Concepts. The primary Program Areas of Interest are in: 1) Naval Expeditionary Health Services Support (Navy in Terrestrial, Maritime Surface, Submarine, and Aviation Operations), 2) USMC in Expeditionary Operations, and 3) Products for battlefield treatment and en route care of Combat Casualties and Combat Trauma, focusing on delivery of care within the seabase and the littoral environment.

For Product Areas 1 and 2, there are two primary acquisition strategies. The first is to test and evaluate for Naval application commercially-developed medical product or candidates in managed trials with the ultimate goal of Food and Drug Administration (FDA) approval. Partnerships with commercial developers promotes developing products of military interest for procurement by the Operating Forces. A second benefit of this strategy is that products are made available across the DoD, Federal Government, and commercial market, thus reducing overall procurement costs. During development, DoD end users are included in the process to the extent possible. The second strategy is to drive a collaborative development process with larger DoD program investments. Navy and Marine Corps needs can be met at lower service cost. This process involves developing in-house or industrial prototypes in government- managed programs to meet Naval needs while meeting regulatory requirements for production and fielding. Both tactics promote development of procurement plans that align product availability with Service integration strategies.

The Third Product Area (Knowledge/Concepts) is focused on the introduction of technologies, techniques, and procedures that enhance medical practice and standards of care for effective delivery of health care and casualty care in the Naval operating environment. These primarily require early involvement of the senior leadership of military medicine, in that the end product of the program is modification of concepts of operations, policy, and/or doctrine. These acquisitions can impact the care and performance of Sailors and Marines. Medical Development Program examples include Navy Crew Endurance Handbook and associated implementation tools.

E. Performance Metrics

Successful completion of Milestones/Demonstration Events for individualized project/product roadmap, on time and on budget. Ensuring dependencies across multiple efforts are maintained on schedule are primary metrics.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*	Project (Number/Name) 0000 / *UNDIST*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Malaria Vaccine	SS/CR	Sanaria Inc. : Rockville, MD	0.000	3.815	Sep 2017	0.000		0.000		-		0.000	0.000	3.815	-
Malaria Vaccine	C/FFP	Various : Not Specified	0.000	0.057	Aug 2017	0.000		0.000		-		0.000	0.000	0.057	-
Individualized Fatigue Based Scheduling	SS/FFP	Pulsar Informatics : Philadelphia, PA	0.000	0.078	Jun 2017	0.000		0.000		-		0.000	0.000	0.078	-
Human Factors Individualized Fatigue Based Scheduling	Allot	Naval Submarine Medical Research Laboratory : Groton, CT	0.000	0.315	Nov 2016	0.000		0.000		-		0.000	0.000	0.315	-
Fatigue Based Scheduling	WR	Naval Post Graduate School : Monterey, CA	0.000	0.205	Dec 2016	0.000		0.000		-		0.000	0.000	0.205	-
Support of Naval Expeditionary Health Service Support (NEHSS) Modernization	Various	Various : Not Specified	0.000	0.060	Jan 2017	0.000		0.000		-		0.000	0.000	0.060	-
Future capabilities products & technologies: Management of Moderate to Severe Hemorrhage	Various	Various : Not Specified	0.000	0.358	Feb 2017	0.000		0.000		-		0.000	0.000	0.358	-
Marine Corps Systems Command Medical Products and Equipment	Various	Various : Not Specified	0.000	0.112	Jun 2017	0.000		0.000		-		0.000	0.000	0.112	-
Phage Therapy	Allot	Naval Medical Research Center : Silver Spring, MD	0.000	0.630	Jun 2017	0.000		0.000		-		0.000	0.000	0.630	-
Mitigation of Adverse Physiological Episodes	Allot	Naval Medical Research Unit : Dayton, OH	0.000	0.578	Sep 2017	0.000		0.000		-		0.000	0.000	0.578	-
		Subtotal	0.000	6.208		0.000		0.000		-		0.000	0.000	6.208	N/A

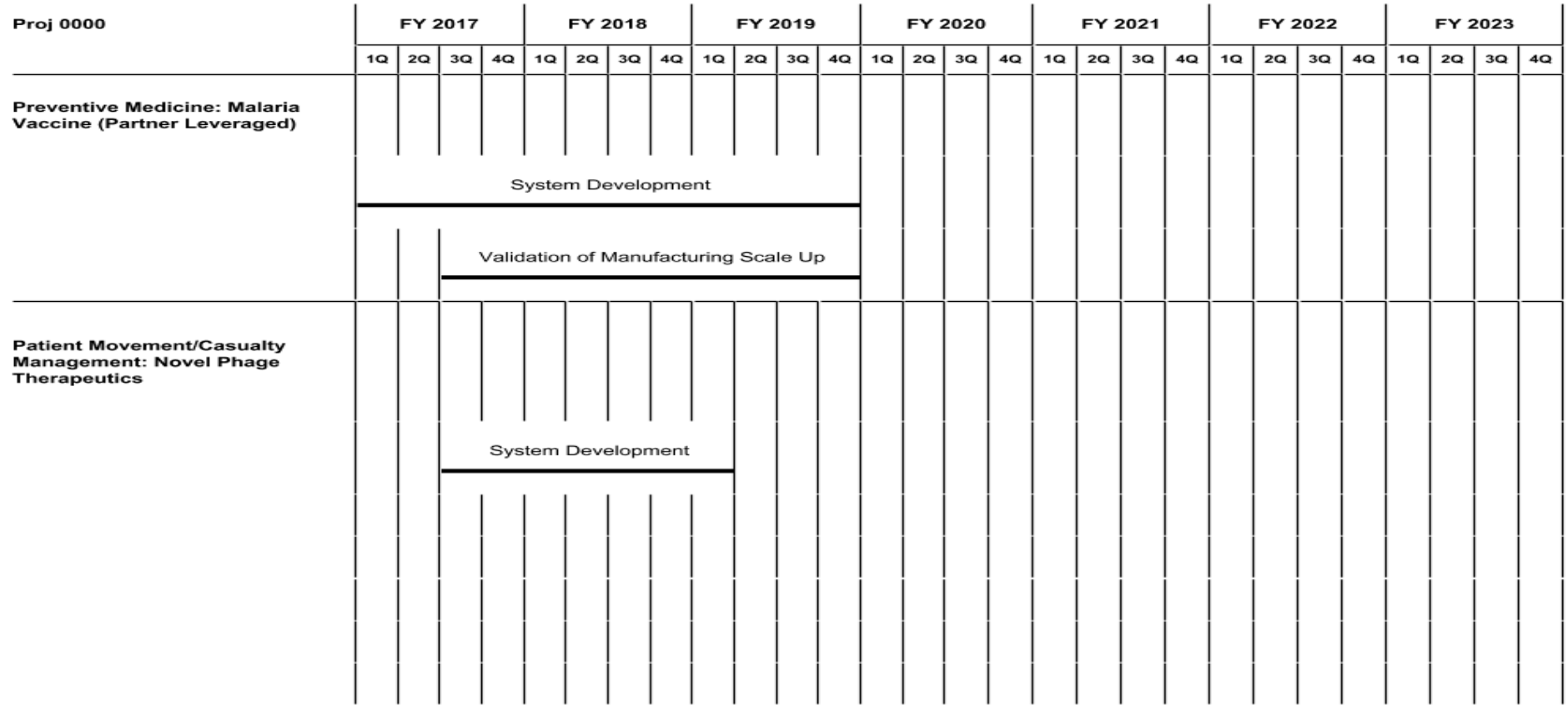
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*	Project (Number/Name) 0000 / *UNDIST*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	6.208		0.000		0.000		-		0.000	0.000	6.208	N/A

Remarks

The FY2017 funding that is reflected in 0000 is erroneous due to a database error and should be reflected in project 0933.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 0000 / *UNDIST*



2019PB - 0604771N - 0000

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 0000 / *UNDIST*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0000				
Preventive Medicine: Malaria Vaccine (Partner Leveraged): System Development	1	2017	4	2019
Preventive Medicine: Malaria Vaccine (Partner Leveraged): Validation of Manufacturing Scale Up	3	2017	4	2019
Patient Movement/Casualty Management: Novel Phage Therapeutics: System Development	3	2017	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*	Project (Number/Name) 0933 / *Medical/Dental Equipment Dev*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0933: *Medical/Dental Equipment Dev*	22.664	2.812	9.353	8.095	-	8.095	8.214	9.067	9.291	9.520	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 2017 funding that is reflected in projects 0000 and 2896 is erroneous due to a database error and should be reflected under this project.

A. Mission Description and Budget Item Justification

The purpose of this program is to develop biomedical equipment and related techniques to reduce morbidity; to enhance the logistic feasibility of modern medical care for combat casualties; to sustain casualties for evacuation to fixed medical facilities for definitive care; and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firms/industry participation in the projects.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Medical/Dental Equipment Development	2.812	9.353	8.095	0.000	8.095
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue system development and validation of manufacturing support for military relevant Malaria vaccine regimen production scale up. -Continue validation of Individual Fatigue-Based Scheduling and Countermeasure System that predicts, prevents, detects, and mitigates periods of high risk associated with fatigue. Individualized performance risk will be predicted and prevented by providing individual fatigue optimized schedules and mitigation strategies. -Continue fatigue mitigation and validation of scheduling tools to include validation of an alternative watchstanding schedule on Naval Surface Combatants. -Continue development of transitioned future capability products and technologies. Complete transition of technologies for management of moderate to severe hemorrhage. -Complete Naval Expeditionary Health Service Support: Effects of High Deck Accelerations on Surgical Tasks at Sea - Phase III Study. -Continue joint development projects with MARCORSYSCOM acquisition for medical products and equipment. -Continue to support phage therapy to combat antibiotic resistant bacterial infections. -Continue support for mitigating adverse physiological episodes to enhance safety and warfighter readiness in tactical aircraft.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 0933 / *Medical/Dental Equipment Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Initiate Human Performance/Crew Endurance effort: Enhancing Decision-Making under Stress. -Initiate Human Performance/Crew Endurance effort: Controlled Light Exposure and Fatigue Mitigation. -Initiate innovative medical technologies; enhanced medical logistics. Primary focus includes: 1) Enhancing casualty treatment capabilities while reducing the overall logistics burden; 2) Enhancing medical logistics capability; and 3) Continue Enroute care, patient transport and trauma care systems associated with the time distance continuum in a sea base environment. ***FY 2019 Base Plans:*** -Complete system development and validation of manufacturing support for military relevant Malaria vaccine regimen production scale up. -Complete validation of Individual Fatigue-Based Scheduling and Countermeasure System that predicts, prevents, detects, and mitigates periods of high risk associated with fatigue. -Complete fatigue mitigation and validation of scheduling tools to include validation of an alternative watchstanding schedule on Naval Surface Combatants. -Continue joint development projects with MARCORSYSCOM acquisition for medical products and equipment. -Complete support for phage therapy to combat antibiotic resistant bacterial infections. -Complete support for mitigating adverse physiological episodes to enhance safety and warfighter readiness in tactical aircraft. -Complete Human Performance/Crew Endurance effort: Enhancing Decision-Making under Stress. -Continue Human Performance/Crew Endurance effort: Controlled Light Exposure and Fatigue Mitigation. -Continue innovative medical technologies; enhanced medical logistics. Primary focus includes: 1) Enhancing casualty treatment capabilities while reducing the overall logistics burden; 2) Enhancing medical logistics capability; and 3) Continue Enroute care, patient transport and trauma care systems associated with the time distance continuum in a sea base environment. ***FY 2019 OCO Plans:*** None ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was reduced by -$0.105 million to account for the availability of prior year execution balances, which will result in a slower development of projects.					
Accomplishments/Planned Programs Subtotals	2.812	9.353	8.095	0.000	8.095

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 0933 / *Medical/Dental Equipment Dev*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

The acquisition strategy for product lines and products in the Medical Development Program is designed and implemented consistent with the purpose of the particular product and with the nature and size of the investment. The Medical Development Program has a Memorandum of Agreement with the Marine Corps Systems Command (Family of Field Medical Equipment) for co-development of products for procurement by the USMC. The acquisition strategy for products involves direct partnership with the acquisition and procurement professionals at Marine Corps Systems Command.

The major Product Areas in the Medical Development Program are: 1) Equipment, 2) Pharmaceuticals/Biologics, and 3) Operational Knowledge/Concepts. The primary Program Areas of Interest are in: 1) Naval Expeditionary Health Services Support (Navy in Terrestrial, Maritime Surface, Submarine, and Aviation Operations), 2) USMC in Expeditionary Operations, and 3) Products for battlefield treatment and en route care of Combat Casualties and Combat Trauma, focusing on delivery of care within the seabase and the littoral environment.

For Product Areas 1 and 2, there are two primary acquisition strategies. The first is to test and evaluate for Naval application commercially-developed medical product or candidates in managed trials with the ultimate goal of Food and Drug Administration (FDA) approval. Partnerships with commercial developers promotes developing products of military interest for procurement by the Operating Forces. A second benefit of this strategy is that products are made available across the DoD, Federal Government, and commercial market, thus reducing overall procurement costs. During development, DoD end users are included in the process to the extent possible. The second strategy is to drive a collaborative development process with larger DoD program investments. Navy and Marine Corps needs can be met at lower service cost. This process involves developing in-house or industrial prototypes in government-managed programs to meet Naval needs while meeting regulatory requirements for production and fielding. Both tactics promote development of procurement plans that align product availability with Service integration strategies.

The Third Product Area (Knowledge/Concepts) is focused on the introduction of technologies, techniques, and procedures that enhance medical practice and standards of care for effective delivery of health care and casualty care in the Naval operating environment. These primarily require early involvement of the senior leadership of military medicine, in that the end product of the program is modification of concepts of operations, policy, and/or doctrine. These acquisitions can impact the care and performance of Sailors and Marines. Medical Development Program examples include Navy Crew Endurance Handbook and associated implementation tools.

E. Performance Metrics

Successful completion of Milestones/Demonstration Events for individualized project/product roadmap, on time and on budget. Ensuring dependencies across multiple efforts are maintained on schedule are primary metrics.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*	Project (Number/Name) 0933 / *Medical/Dental Equipment Dev*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Malaria Vaccine	SS/CR	Sanaria, Inc. : Rockville, MD	5.984	1.100	Jan 2018	0.000		0.000		-		0.000	0.000	7.084	Continuing
Malaria Vaccine	C/FFP	Various : Not Specified	0.105	0.028	Dec 2017	0.000		0.000		-		0.000	0.000	0.133	Continuing
Individualized Fatigue Based Scheduling	SS/FP	Pulsar Informatics : Philadelphia, PA	5.810	0.030	Jun 2017	0.550	Mar 2018	0.000		-		0.000	0.000	6.390	-
Human Factors Individualized Fatigue Based Scheduling	Allot	Naval Submarine Medical Research Laboratory : Groton, CT	1.541	0.100	Nov 2016	0.425	Jan 2018	0.430	Dec 2018	-		0.430	Continuing	Continuing	Continuing
Fatigue Based Scheduling	WR	Naval Post Graduate School : Monterey, CA	1.149	0.175	Dec 2016	0.390	Dec 2017	0.000		-		0.000	0.000	1.714	-
Support of Naval Expeditionary Health Service Support (NEHSS) Modernization	Various	Various : Not Specified	0.955	0.053	Jan 2017	0.000		0.000		-		0.000	0.000	1.008	Continuing
Future capabilities products & technologies: Management of Moderate to Severe Hemorrhage	Various	Various : Not Specified	0.490	0.169	Feb 2017	0.000		0.000		-		0.000	0.000	0.659	Continuing
Marine Corps Systems Command Medical Products and Equipment	Various	Various : Not Specified	0.274	0.100	Jun 2017	0.750	May 2018	0.800	Mar 2019	-		0.800	Continuing	Continuing	Continuing
Phage Therapy	Allot	Naval Med Rsrch. Cntr./Walter Reed Inst. of Rsrch. : Silver Spring, MD	0.000	0.532	Jun 2017	0.346	Dec 2017	0.000		-		0.000	0.000	0.878	Continuing
Mitigation of Adverse Physiological Episodes in Tactical Aircraft	Allot	Various : Not Specified	0.000	0.272	Sep 2017	0.995	Dec 2017	0.000		-		0.000	0.000	1.267	Continuing
Enhanced Decision Makiing Under Stress	Allot	Naval Health Research Center : San Diego, CA	0.000	0.000		0.397	Dec 2017	0.000		-		0.000	0.000	0.397	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 0933 / *Medical/Dental Equipment Dev*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Crew Endurance and Fatigue Mitigation	WR	Naval Post Graduate Schoo : Monterey, CA	0.000	0.000		0.750	Jan 2018	0.750	Dec 2018	-		0.750	Continuing	Continuing	Continuing
Innovative Medical Technologies and Logistics	Various	Various : Not Specified	0.000	0.000		2.899	May 2018	4.275	May 2019	-		4.275	Continuing	Continuing	Continuing
Medical Product Development	Various	Various : Not Specified	5.586	0.000	Aug 2017	0.977	Aug 2018	0.966	Aug 2019	-		0.966	Continuing	Continuing	Continuing
		Subtotal	21.894	2.559		8.479		7.221		-		7.221	Continuing	Continuing	N/A

Management Services ($ in Millions)

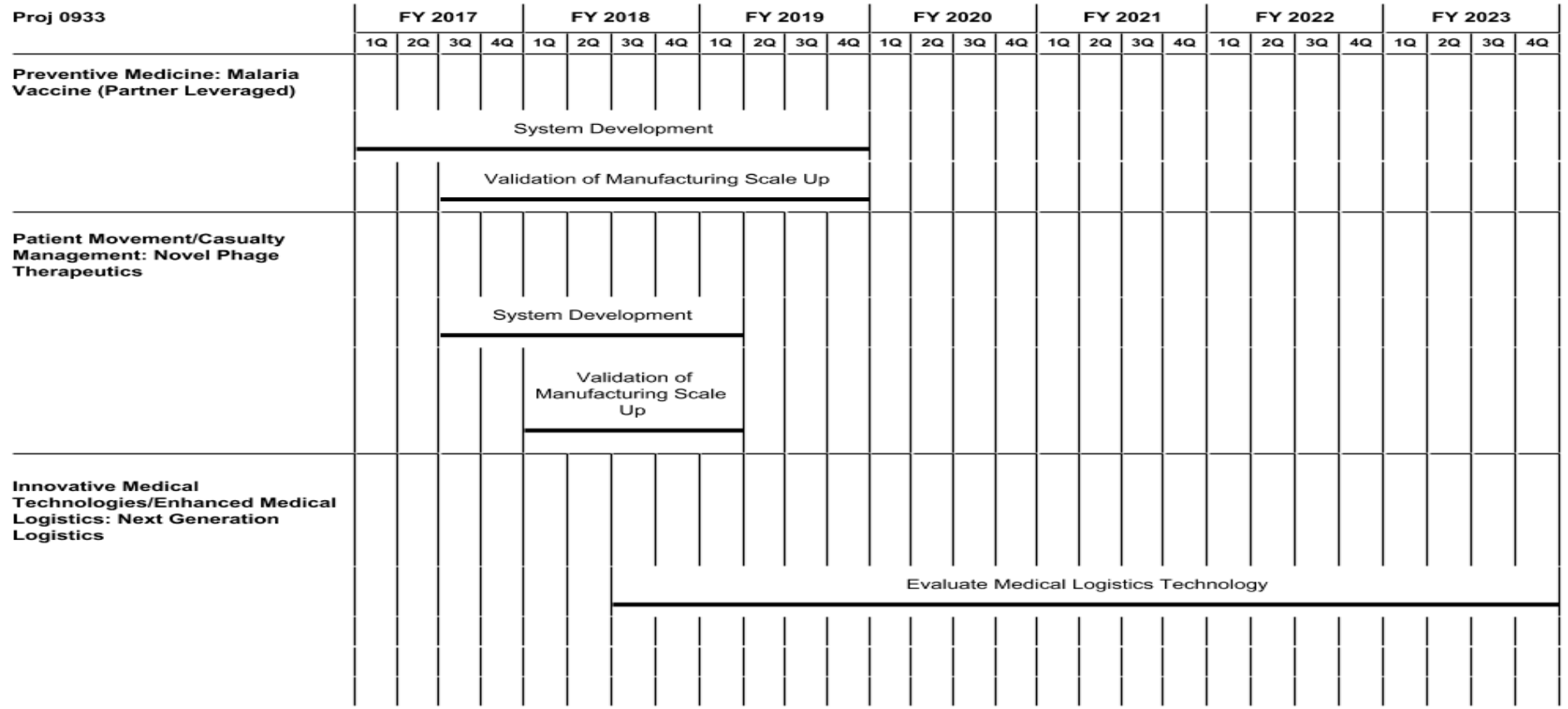
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support	Various	Various : Not Specified	0.770	0.253	Aug 2017	0.874	Aug 2018	0.874	Aug 2019	-		0.874	Continuing	Continuing	Continuing
		Subtotal	0.770	0.253		0.874		0.874		-		0.874	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	22.664	2.812		9.353		8.095		-		8.095	Continuing	Continuing	N/A

Remarks

The FY 2019 funding request was reduced by -$0.105 million to account for the availability of prior year execution balances.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 0933 / *Medical/Dental Equipment Dev*



2019PB - 0604771N - 0933

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 0933 / *Medical/Dental Equipment Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0933				
Preventive Medicine: Malaria Vaccine (Partner Leveraged): System Development	1	2017	4	2019
Preventive Medicine: Malaria Vaccine (Partner Leveraged): Validation of Manufacturing Scale Up	3	2017	4	2019
Patient Movement/Casualty Management: Novel Phage Therapeutics: System Development	3	2017	1	2019
Patient Movement/Casualty Management: Novel Phage Therapeutics: Validation of Manufacturing Scale Up	1	2018	1	2019
Innovative Medical Technologies/Enhanced Medical Logistics: Next Generation Logistics: Evaluate Medical Logistics Technology	3	2018	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*	Project (Number/Name) 2896 / *Military Dental Research*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2896: *Military Dental Research*	0.000	0.015	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.015
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 17 funding reflected in this project is erroneous due to a database error. This funding should be reflected in Project 0933.

A. Mission Description and Budget Item Justification

The purpose of this program is to develop biomedical equipment and related techniques to reduce morbidity; to enhance the logistic feasibility of modern medical care for combat casualties; to sustain casualties for evacuation to fixed medical facilities for definitive care; and to ensure that personnel are medically qualified for military duty. Each work unit undertaken in this project has a military requirement. Efforts are justified based upon military payoff and cost benefit. There is a strong potential for dual use, technology transfer, and biotechnology firm/industry participation in the projects.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Medical/Dental Equipment Development	0.015	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: N/A					
Accomplishments/Planned Programs Subtotals	0.015	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 2896 / *Military Dental Research*

D. Acquisition Strategy

The major Product Areas in the Medical Development Program are: 1) Equipment, 2) Pharmaceuticals/Biologics, and 3) Operational Knowledge/Concepts. The primary Program Areas of Interest are in: 1) Naval Expeditionary Health Services Support (Navy in Terrestrial, Maritime Surface, Submarine, and Aviation Operations), 2) USMC in Expeditionary Operations, and 3) Products for battlefield treatment and en route care of Combat Casualties and Combat Trauma, focusing on delivery of care within the seabase and the littoral environment.

For Product Areas 1 and 2, there are two primary acquisition strategies. The first is to test and evaluate for Naval application commercially-developed medical product or candidates in managed trials with the ultimate goal of Food and Drug Administration (FDA) approval. Partnerships with commercial developers promotes developing products of military interest for procurement by the Operating Forces. A second benefit of this strategy is that products are made available across the DoD, Federal Government, and commercial market, thus reducing overall procurement costs. During development, DoD end users are included in the process to the extent possible. The second strategy is to drive a collaborative development process with larger DoD program investments. Navy and Marine Corps needs can be met at lower service cost. This process involves developing in-house or industrial prototypes in government- managed programs to meet Naval needs while meeting regulatory requirements for production and fielding. Both tactics promote development of procurement plans that align product availability with Service integration strategies.

The Third Product Area (Knowledge/Concepts) is focused on the introduction of technologies, techniques, and procedures that enhance medical practice and standards of care for effective delivery of health care and casualty care in the Naval operating environment. These primarily require early involvement of the senior leadership of military medicine, in that the end product of the program is modification of concepts of operations, policy, and/or doctrine. These acquisitions can impact the care and performance of Sailors and Marines. Medical Development Program examples include Navy Crew Endurance Handbook and associated implementation tools.

E. Performance Metrics

Successful completion of Milestones/Demonstration Events for individualized project/product roadmap, on time and on budget. Ensuring dependencies across multiple efforts are maintained on schedule are primary metrics.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*	Project (Number/Name) 2896 / *Military Dental Research*	

Management Services ($ in Millions)

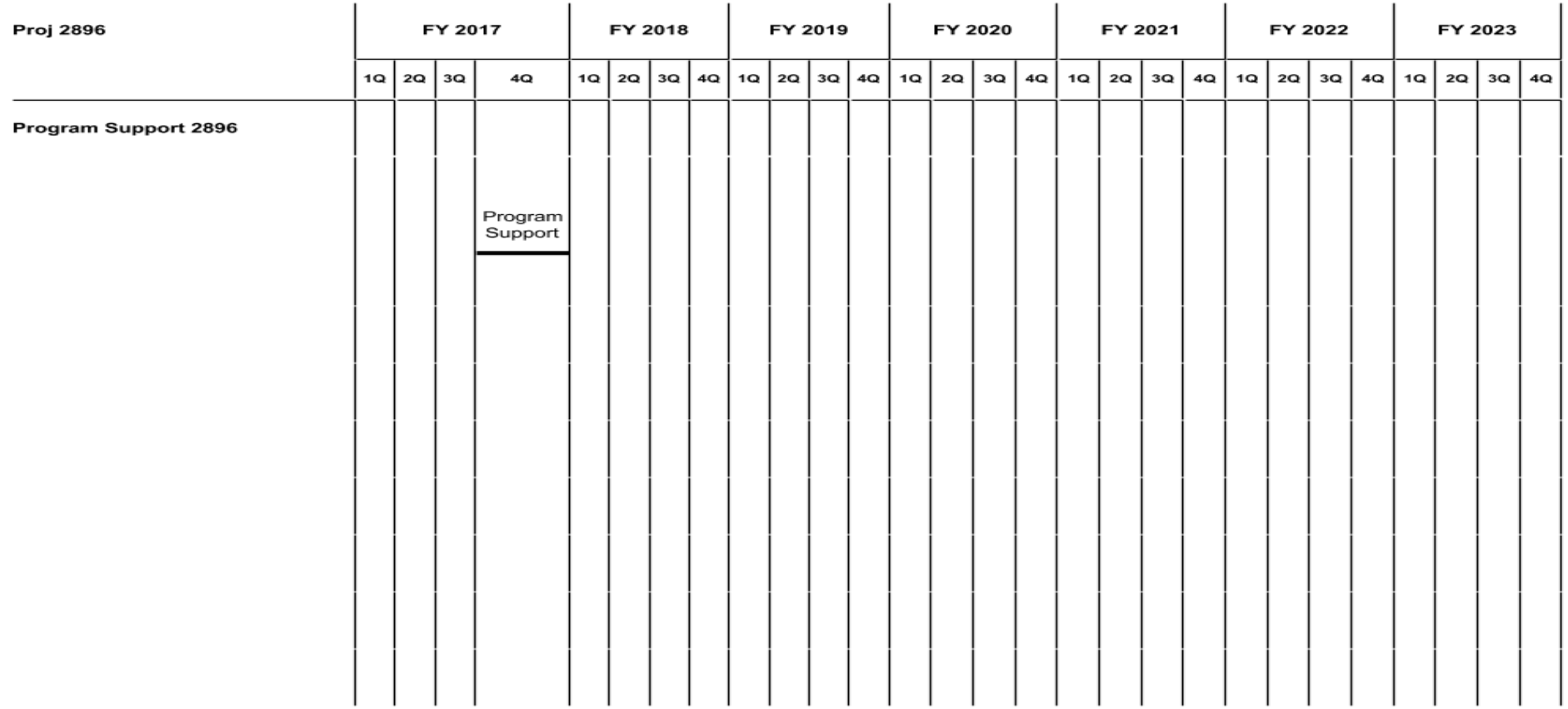
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support	Various	Various : Not Specified	0.000	0.015	Aug 2017	0.000		0.000		-		0.000	0.000	0.015	-
		Subtotal	0.000	0.015		0.000		0.000		-		0.000	0.000	0.015	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.015		0.000		0.000		-		0.000	0.000	0.015	N/A

Remarks

The FY2017 funding that is reflected in 2896 is erroneous and should be reflected in project 0933.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 2896 / *Military Dental Research*



2019PB - 0604771N - 2896

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 2896 / *Military Dental Research*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2896				
Program Support 0933:	4	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*				Project (Number/Name) 9999 / *Congressional Adds*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
9999: *Congressional Adds*	116.826	15.475	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	132.301
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

None

A. Mission Description and Budget Item Justification

Congressional Adds: Military Dental Research

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Military Dental Research ***FY 2017 Accomplishments:*** -Continued efforts in cranio-facial injury surveillance; combat dentistry; treatment of maxillofacial injury; dental disease non-battle injuries; oral/facial disease and infection in military personnel. ***FY 2018 Plans:*** N/A	5.803	0.000
Congressional Add: Wound Care Research (transferred from Defense Health Program) ***FY 2017 Accomplishments:*** -Continued to develop novel diagnostics and treatments to enhance the care of the wounded warfighter. ***FY 2018 Plans:*** N/A	9.672	0.000
Congressional Adds Subtotals	15.475	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

None

E. Performance Metrics

Not required for Congressional adds.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604771N / *Medical Development*	Project (Number/Name) 9999 / *Congressional Adds*	

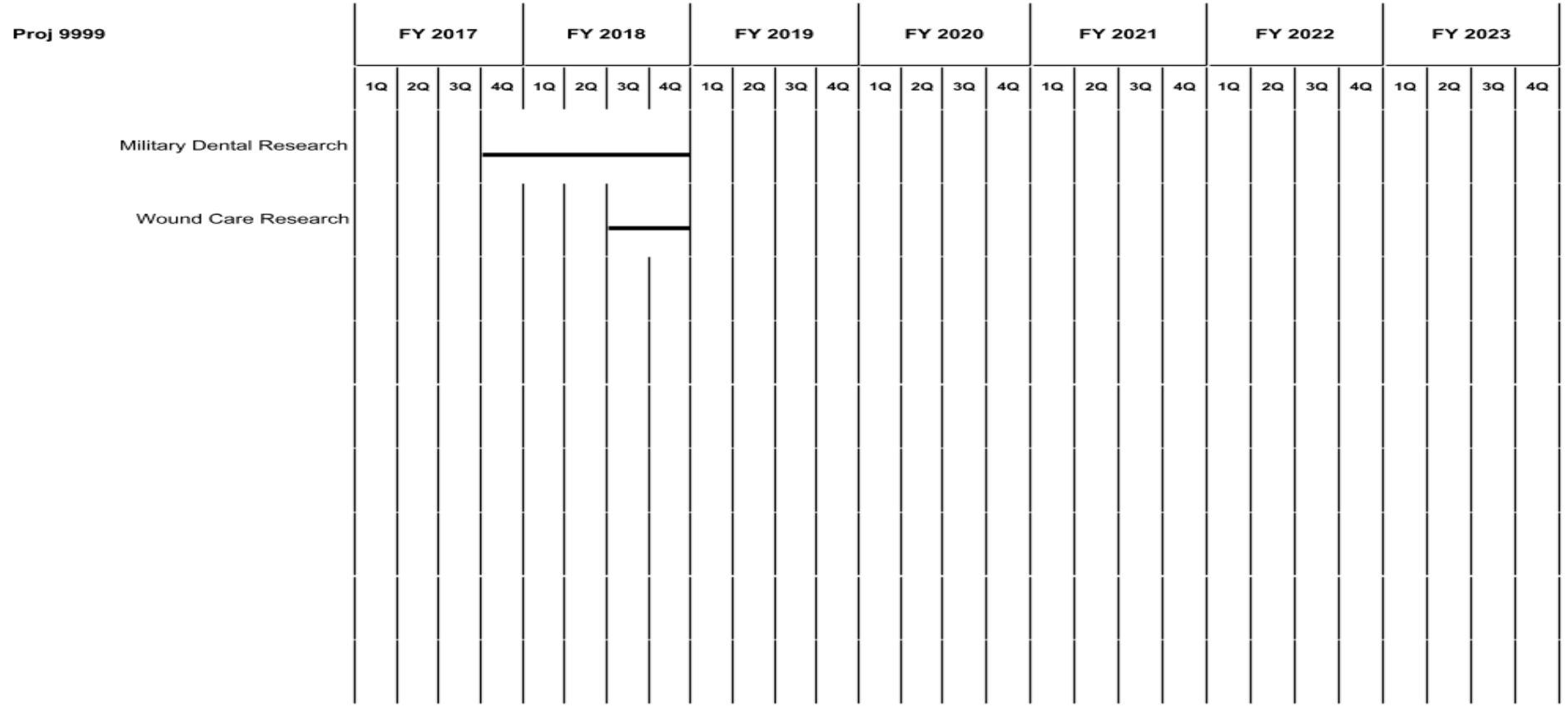
Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Congressional Add - Wound Care Research	C/FFP	Noveome Biotherapeutics Inc. : Pittsburg, PA	22.260	9.672	Apr 2018	0.000		0.000		-		0.000	0.000	31.932	-
Congressional Add - Military Dental Research	Allot	Naval Medical Research Unit - San Antonio : San Antonio, TX	5.969	2.952	Aug 2017	0.000		0.000		-		0.000	0.000	8.921	-
Congressional Add - Military Dental Research	MIPR	USAISR Dental and Trauma Research Detachment : San Antonio, TX	5.821	2.851	Aug 2017	0.000		0.000		-		0.000	0.000	8.672	-
Congressional Adds	Various	Various : Not Specified	82.776	0.000		0.000		0.000		-		0.000	0.000	82.776	-
		Subtotal	116.826	15.475		0.000		0.000		-		0.000	0.000	132.301	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	116.826	15.475		0.000		0.000		-		0.000	0.000	132.301	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 9999 / *Congressional Adds*



2019PB - 0604771N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604771N / *Medical Development*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Military Dental Research: Schedule Detail	4	2017	4	2018
Wound Care Research: Schedule Detail	3	2018	4	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604777N *I Navigation/Id System*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	561.203	41.905	92.546	121.026	-	121.026	138.648	101.254	85.693	69.074	Continuing	Continuing
0253: *Nav & Electro-Optical Supt*	54.983	3.904	7.477	35.963	-	35.963	36.612	37.381	38.153	38.942	Continuing	Continuing
0676: *Improve ID Development*	41.849	5.013	2.477	2.405	-	2.405	2.335	9.646	8.768	2.482	Continuing	Continuing
0921: *NAVSTAR GPS Equipment*	281.975	23.668	80.044	80.675	-	80.675	97.814	52.298	36.807	25.645	Continuing	Continuing
1253: *Combat Ident System*	182.396	3.517	2.548	1.983	-	1.983	1.887	1.929	1.965	2.005	Continuing	Continuing
9999: *Congressional Adds*	0.000	5.803	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.803

A. Mission Description and Budget Item Justification

Reliable and secure navigation and positive identification (ID) systems are essential elements of battle management in the naval environment. The Photonics Imaging System (0253) is a non-hull penetrating replacement for existing optical periscopes. The Photonics Imaging System exploits a wide portion of the electro-magnetic spectrum utilizing advanced Electro-Optic/thermal imaging, and communications intercept/Electronic Warfare Support (ES). The Integrated Submarine Imaging System (ISIS) (0253) is a back fit system to integrate all imaging capabilities on existing submarine classes. The Combat Identification System (CIS) project (1253) for Mark XIIA, and Improved Identification Development (0676) for AN/UPX-29(V), covers the Mark XIIA Mode 5 upgrade to the existing Mark XII family of systems that is Joint and North Atlantic Treaty Organization (NATO) interoperable. Per OSD direction, NATO participation is encouraged and performance data is exchanged to ensure the opportunity for interoperability with allied identification systems is maximized. In addition to distinguishing friend from foe for weapons employment, the Navy requires secure, jam resistant Identification Friend or Foe (IFF) systems for battle group air defense management and air traffic control. Identification is multifaceted and includes information received from several sensors (both cooperative and non-cooperative systems).

Navigation Satellite Timing & Ranging (NAVSTAR) Global Positioning System (GPS) project (0921) is a space-based Positioning, Navigation, and Timing (PNT) system that provides authorized users with secure, worldwide, all weather, three dimensional position, velocity, and precise time data. NAVSTAR GPS provides Assured PNT (A-PNT) capability to Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR) and combat systems in standalone and networked architectures throughout air and maritime domains. This project is comprised of four distinct efforts: Air and Sea Navigation Warfare (NAVWAR), GPS-based PNT Service (GPNTS), and GPS Modernization. Research, Development, Testing and Evaluation (RDT&E) funds are used to perform all the non-recurring GPS Surface Ship, Submarine and Aircraft Development, Integration, and Testing efforts in support of NAVSTAR GPS.

The Air and Sea NAVWAR programs were established to provide continued access to GPS information in a denied or impeded electronic environment. Development efforts for both programs provide improvements to various platform type antennas and ensure compatibility with the new Military Code (M-Code) signal. The Air NAVWAR program continues integration efforts using GPS Antenna System (GAS-1), Advanced Digital Antenna Production (ADAP), and other anti-jam antennas on air platforms while investigating smaller anti-jam antennas for space constrained platforms and aircraft with unique requirements. The Sea NAVWAR program integrates Anti-Jam (AJ) antennas onto surface and subsurface platforms. Sea NAVWAR will continue to research the viability of smaller anti-jam antennas for space-constrained

platforms and to support the Submarine Anti-Jam GPS Enhancement (SAGE) antenna development which integrates AJ capability into the submarine Multi-Function Mast (OE-538B) antenna system.

The Global Positioning System (GPS)-Based Positioning, Navigation and Timing (PNT) Service (GPNTS) system is being developed to serve as the primary PNT system for the Navy to ensure reliable PNT capability and interoperability insertion into GPS receivers and associated Command, Control, Computers, Communications and Intelligence (C4I), and Combat Systems in a challenged/jammed environment. GPNTS provides precise PNT data required for combat, weapons, command, control, communications, navigation, and other systems, as well as providing the time synchronization critical to the network environments. GPNTS will back fit current PNT/GPS systems as well as serve as a forward fit for new platforms. GPNTS will host the GPS Directorate-developed Military GPS User Equipment (MGUE) card, allowing access to the new GPS M-Code signal. GPNTS will provide more robust and secure GPS/PNT capabilities than is currently in the Fleet. The system will provide the capability to migrate non-real time GPS data toward a Common Computing Environment (CCE), such as Consolidated Afloat Networks Enterprise Services (CANES), and provide a path for the integration of advanced navigation systems and sensors. GPNTS provides Assured PNT (A-PNT) capability to Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR) and Combat Systems in standalone and networked architectures throughout maritime domains.

GPS Modernization addresses the Navy's future integration of the GPS Directorate MGUE products being developed by the Air Force that will enable the use of new GPS signals. This effort supports Navy compliance with Public Law 111-383 which mandates only M-Code capable receivers are to be procured after FY 2017. GPS Modernization consists of multiple parallel efforts that address the Navy's integration of multiple next generation GPS receivers that provide Naval air, surface, subsurface and weapon platforms improved access to GPS signals in challenged and jamming environments. Modernized GPS receivers will utilize the new M-Code GPS Signal in Space, incorporate enhanced cryptology, deliver greater position and time accuracy, and provide improved protection against signal spoofing. Additionally, GPS Modernization delivers increased GPS anti-jam protection and enables blue force GPS electronic attack.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	42.723	92.546	120.792	-	120.792
Current President's Budget	41.905	92.546	121.026	-	121.026
Total Adjustments	-0.818	0.000	0.234	-	0.234
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.806	0.000			
• Program Adjustments	0.000	0.000	-2.000	-	-2.000
• Rate/Misc Adjustments	0.000	0.000	2.234	-	2.234
• Congressional General Reductions Adjustments	-0.012	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0604777N *I Navigation/Id System*			
• Congressional Directed Reductions	-6.000	-	-	-	-
Adjustments					
• Congressional Add Adjustments	6.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)

	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Improved GPS*	5.803	0.000
Congressional Add Subtotals for Project: 9999	5.803	0.000
Congressional Add Totals for all Projects	5.803	0.000

Change Summary Explanation

The FY 2019 funding request was reduced by $0.792 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Technical: The increase to Global Positioning System (GPS) Modernization in FY 2019 supports multiple software intensive updates and non-recurring engineering services specifically for F/A-18E/F, EA-18G and E-2D air platforms for the integration of Military Code (M-Code) capable GPS receivers. FY19 funding also supports a full year of integration, government systems engineering and software development efforts for the integration of M-Code capable GPS receivers for surface ship platforms and seven (7) air platforms: F/A-18E/F, EA-18G, E-2D, MV-22B, CMV-22B, CH-53K, and KC-130J.

Program:
Proj: 0253 Nav & Electro-Optical Supt:FY 2019 $26.830M increase is for the major design, development, fabrication, and verification testing of the new Task Oriented Technical Insertion Mast (TOTIM) required for Columbia Class and VA Class Submarines. TOTIM development will utilize open architecture and a non-rotating modular design to reduce life cycle costs and enable flexibility for future capability upgrades. FY 2019 increase includes developing the TOTIM technical data package, executing design reviews, developing test plans, designing counter detection vulnerability reduction, procuring and fabricating the TOTIM test article, and executing test events and environmental qualification testing of TOTIM.

Proj: 0921 NAVSTAR GPS Equipment:GPS Modernization re-baselined schedule to move E-6B air platform initiation from FY18 to FY20 and surface ships from the out-years into FY18 to begin M-Code capability efforts for Size Weight and Power and Cost (SWaP-C) constrained Surface Platforms that cannot accept Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) such as Military Sealift Command (MSC) surface ships.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 0253 / *Nav & Electro-Optical Supt*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0253: *Nav & Electro-Optical Supt*	54.983	3.904	7.477	35.963	-	35.963	36.612	37.381	38.153	38.942	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY19 navigation and electro-optical (E-O) support program develops submarine E-O and imagery systems and equipment that will improve submarine imaging capability in the areas of: ship safety, Intelligence, Surveillance and Reconnaissance (ISR), and tactical control (contact management in the littorals). The Department of the Navy established the Integrated Submarine Imaging System (ISIS) to rapidly field the Type 18 periscope, Periscope Acquisition, Tracking, and Ranging with Improved Observation Techniques (PATRIOT) rangefinder, Type 8 Mod 4 Infra-Red (IR) periscope systems, and integrate existing periscope imagery systems into a single imaging system for installation on board SSN 688 class and SEAWOLF class submarines. The ISIS baseline also includes the Imaging System with the Photonics Mast (PM) and all configurations of Low Profile Photonics Mast (LPPM) onboard VIRGINIA and Photonics Mast Variant (PMV) onboard SSGN class submarines. The PM, LPPM, and PMV design exploit a wide portion of the electro-magnetic spectrum through advanced E-O and thermal imaging and Electronic Warfare Support (ES)/ communications intercept. The Common Submarine Imaging System (CSIS) capability development document (CDD), that covers both ISIS and Legacy Imaging systems was approved 22 Dec 2011. The CDD is used to fully integrate the ISIS program of record into the submarines force rapid Technical Insertion/Advanced Processor Build (TI/APB) process and to incorporate Fleet-endorsed requirements such as the LPPM. The $28.486M FY19 increase is a significant and key investment in imaging sensors and algorithms to improve submarine operations in high intensity littoral environments, intelligence gathering, real time imagery and support the safe and effective employment of surveillance and weapons systems. First, a $26.830M increase is to design and develop the Tactically Orientated Technical Insertion Mast (TOTIM) which will provide a 360 degree, non-rotating modular mast with vastly increased capability, reduced maintenance costs and increased development flexibility with new reconfigurable mast sensors. Second, a $1.642M increase is to improve the software algorithms and inboard hardware to process the 30 times increase in data provided by TOTIM. Finally, a $0.014M increase is an inflation increase which funds the TI-16 / APB-15 VA Operational Testing that verifies the software improvements funded in previous fiscal years.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: ISIS and Photonics common software and hardware capabilities development and obsolescence.	3.236	5.794	7.436	0.000	7.436
Articles:	-	-	-	-	-
FY 2018 Plans: ISIS Technical Insertion (TI) development for LOS ANGELES, SEAWOLF, VIRGINIA, SSBN and SSGN classes. Consisting of TI and Advanced Processor Build (APB) productionization efforts including incorporation of Automatic Target Recognition, Auto Navigation Fix and Augmented Reality for Navigation as well as integration of unique LPPM capabilities. Continued improvements to current system and software reliability to improve ISIS Operational Availability (Ao).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0253 / *Nav & Electro-Optical Supt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Initiate modifications to the ISIS TI-20 baseline which are required to support TOTIM integration. The baseline modifications update the inboard architecture to support the processing, storage, and display of panoramic imaging data which improves operator effectiveness. While FY18 initiates the design and development of a new system architecture in TI-20 ISIS to support TOTIM, the majority of the design effort occurs in FY19. ***FY 2019 Base Plans:*** The $1.642M increase is to design and develop additional complex and sophisticated imaging algorithms, upgrade software and hardware to process 30 times more imaging data provided by 360 degree TOTIM video and enable system to operate TOTIM. The increased data rates from the 360 degree TOTIM provide enhanced situational awareness and effectiveness. Continue Advanced Processor Build (APB) productionization efforts, to add additional functionality including Image Contact Follower Improvements, Small Craft Detection, and Automatic Target Recognition. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $1.642M increase is to improve and scale ISIS to receive and evaluate 30 times increase in imaging data to be provided by the 360 degree TOTIM video.					
Title: Task-Oriented Technology Insertion Mast (TOTIM)	0.000	1.002	27.832	0.000	27.832
Articles:	-	-	1	-	1
FY 2018 Plans: Initiate development of Task Orientated Tech Insertion Mast (TOTIM) which will provide 360 degree, non-rotating modular mast with vastly increased capability, reduced maintenance costs, and increased development flexibility for new mast sensors. Specific efforts include: development of TOTIM preliminary architecture and common interface between mast modules. ***FY 2019 Base Plans:*** The $26.830M increase is for the major design, development, fabrication, and verification testing of the new Task Oriented Technical Insertion Mast (TOTIM). TOTIM development will utilize open architecture and a non-rotating modular design to reduce life cycle costs and enable flexibility for future capability upgrades. Specific efforts include: -Start development of the TOTIM technical data package -Execute design reviews					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0253 / *Nav & Electro-Optical Supt*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Start developing of the test plans -Start designing counter detection vulnerability reduction -Start procuring and fabricating the TOTIM test article for delivery in FY20 -Execute test events and environmental qualification testing of TOTIM ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 $26.830M increase is to design, develop, fabricate, and test the new Task Oriented Technical Insertion Mast (TOTIM). TOTIM will provide state of the art visual imagery and other sensors which will increase situational awareness (especially in high intensity littoral operations), improve safety of navigation and tactical decision-making, and further advance the safe and effective employment of surveillance and weapons systems. TOTIM development will utilize open architecture and a non-rotating modular design to reduce life cycle costs and enable flexibility for future capability upgrades. FY 2019 increase includes developing the TOTIM technical data package, executing design reviews, developing test plans, designing counter detection vulnerability reduction, procuring and fabricating the TOTIM test article, and executing test events and environmental qualification testing of TOTIM.					
Title: Imaging Systems Test Efforts. ***Articles:*** ***FY 2018 Plans:*** TI-14 / APB-13 VA Integrated Testing (IT) covering capability increases to previous algorithm builds including 360 Degree Image Stitching, LACE Night Modification (VA Class Only) and Super Position. ***FY 2019 Base Plans:*** The $0.014M increase is for TI-16 / APB-15 VA Operational Testing (OT) to verify capability increases to previous algorithm builds including Image Fusion, Automated Detection/Tracking, and Synthetic Horizon. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $0.014M increase is an inflation adjustment which will fund the design, manage and evaluate results of the Operational Test for TI-16 / APB 15 for modernizing VIRGINIA boats.	0.668 -	0.681 -	0.695 -	0.000 -	0.695 -
Accomplishments/Planned Programs Subtotals	3.904	7.477	35.963	0.000	35.963

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0253 / *Nav & Electro-Optical Supt*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/2013: *Photonics Mast*	38.909	39.648	40.442	-	40.442	41.250	42.076	42.918	43.776	Continuing	Continuing
• RDT&E/0604558N: *VIRGINIA Class Design Development*	1.000	1.020	1.040	-	1.040	1.061	1.082	1.104	1.126	Continuing	Continuing
• RDT&E/0603562N: *Advanced Submarine Support Equipment (ASSEP)*	4.419	4.155	4.307	-	4.307	4.672	4.777	4.866	4.977	Continuing	Continuing
• OPN/0840: *Sub Periscope, Imaging Equip. and Supt Equip Program*	151.963	151.240	178.421	-	178.421	199.590	224.643	215.012	255.918	Continuing	Continuing
• RDT&E/0603595N: *COLUMBIA Class Design Development*	0.882	1.024	1.118	-	1.118	1.115	0.898	0.936	0.954	0.000	6.927

Remarks

D. Acquisition Strategy

The Acquisition Strategy for AN/BVY-1 Integrated Submarine Imaging System (ISIS) is dated 07 Jul 2003. The Acquisition Program Baseline Agreement for ISIS Advanced Processor Builds 11, 13 and 15 is dated 07 Mar 2013. The Single Acquisition Management Plan (SAMP) for the LPPM is dated 01 Jul, 2013. The ISIS will provide mission critical, all weather, visual, and electronic search, digital image management, indication, warning, and platform architecture interface capabilities for SSN 688, SSN 21, SSN 774 and SSGN class submarines. The Single Acquisition Management Plan (SAMP) for the TOTIM is dated 07 Jul, 2017.

E. Performance Metrics

Successful application of system engineering processes. Design and development of improvements. The Rapid Development and Deployment (RDD) program goal is to respond to urgent operational needs within 30 days and provide for rapid development and fielding of prototype solutions within 270 days.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0253 / *Nav & Electro-Optical Supt*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/CPIF	Lockheed Martin : Manassas, VA	15.492	1.273	Dec 2016	2.075	Dec 2017	3.142	Dec 2018	-		3.142	Continuing	Continuing	Continuing
Systems Engineering	WR	NUWC : Newport, RI	16.034	0.690	Oct 2016	1.037	Oct 2017	1.558	Dec 2018	-		1.558	Continuing	Continuing	Continuing
Hardware Development	C/CPIF	Lockheed Martin : Manassas, VA	6.460	1.228	Dec 2016	2.636	Dec 2017	2.689	Dec 2018	-		2.689	Continuing	Continuing	Continuing
Hardware Development	TBD	TBD : TBD	0.000	0.000		1.002	Dec 2017	27.832	Dec 2018	-		27.832	Continuing	Continuing	Continuing
Hardware Development	C/CPFF	L3-KEO : Northhampton, MA	7.953	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	45.939	3.191		6.750		35.221		-		35.221	Continuing	Continuing	N/A

Remarks

FY 2019 increase is for the major design, development, fabrication, and verification testing of the new Task Oriented Technical Insertion Mast (TOTIM) required for Columbia Class and VA Class Submarines. TOTIM development will utilize open architecture and a non-rotating modular design to reduce life cycle costs and enable flexibility for future capability upgrades. FY 2019 increase includes developing the TOTIM technical data package, executing design reviews, developing test plans, designing counter detection vulnerability reduction, procuring and fabricating the TOTIM test article ($8.995 million), and executing test events and environmental qualification testing of TOTIM.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	NUWC : Newport, RI	7.400	0.418	Oct 2016	0.426	Oct 2017	0.435	Oct 2018	-		0.435	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.910	0.250	Oct 2016	0.255	Oct 2017	0.260	Oct 2018	-		0.260	Continuing	Continuing	Continuing
Development Test & Evaluation	C/CPFF	Lockheed Martin : Manassas, VA	0.200	0.000	Mar 2017	0.000		0.000		-		0.000	0.000	0.200	-
		Subtotal	8.510	0.668		0.681		0.695		-		0.695	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 0253 / *Nav & Electro-Optical Supt*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	WR	NAVSEA : Washington, DC	0.534	0.045	Oct 2016	0.046	Oct 2017	0.047	Oct 2018	-		0.047	Continuing	Continuing	Continuing
		Subtotal	0.534	0.045		0.046		0.047		-		0.047	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	54.983	3.904		7.477		35.963		-		35.963	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0253 / *Nav & Electro-Optical Supt*

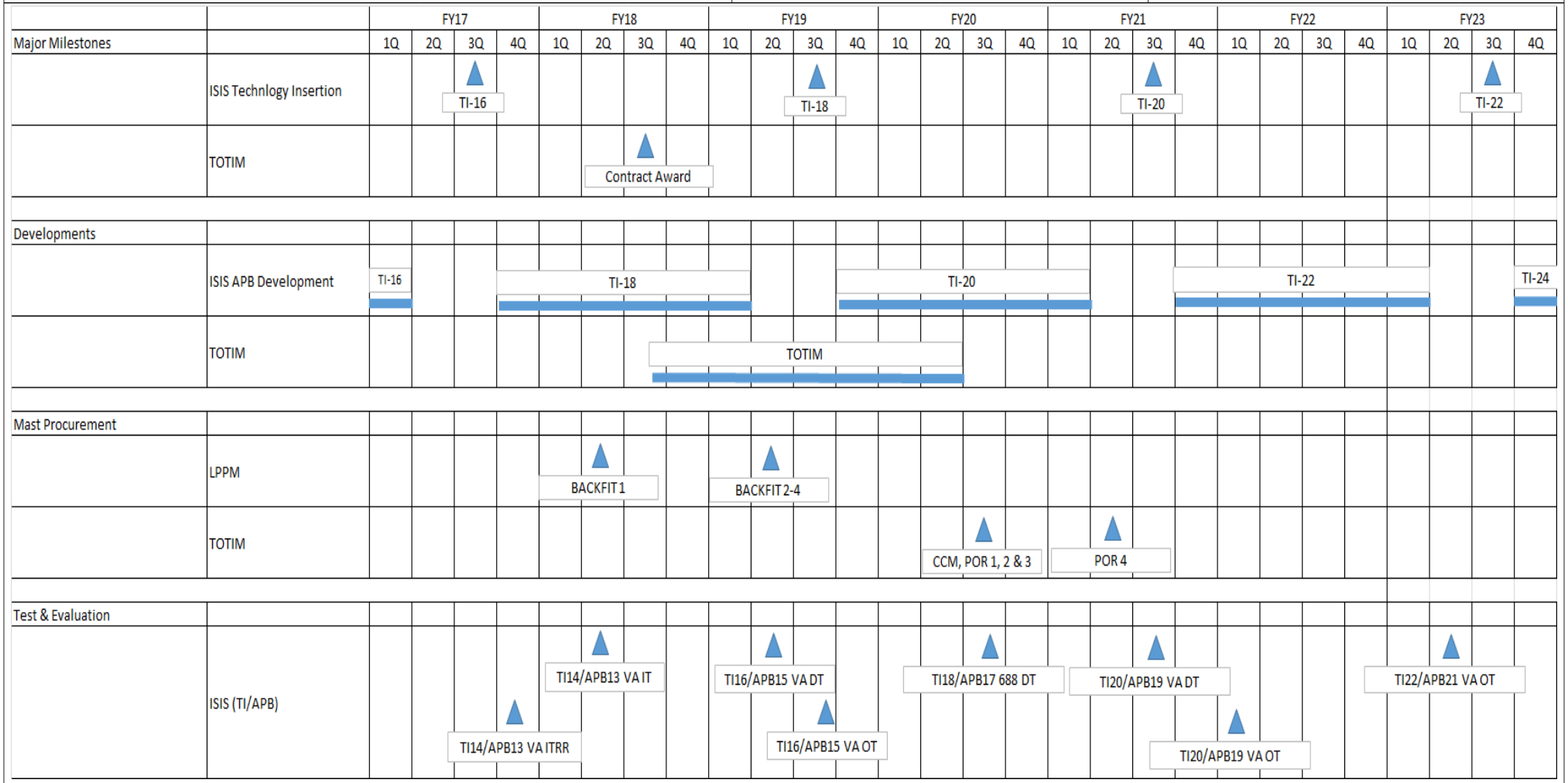


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0253 / *Nav & Electro-Optical Supt*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Nav & Electro-Optical Supt				
Major Milestones: ISIS Technology Insertion: ISIS Technology Insertion Fielding (TI-16)	3	2017	3	2017
Major Milestones: ISIS Technology Insertion: ISIS Technology Insertion Fielding (TI-18)	3	2019	3	2019
Major Milestones: ISIS Technology Insertion: ISIS Technology Insertion Fielding (TI-20)	3	2021	3	2021
Major Milestones: ISIS Technology Insertion: ISIS Technology Insertion Fielding (TI-22)	3	2023	3	2023
Major Milestones: TOTIM: Contract Award	3	2018	3	2018
Developments: ISIS APB Development: Development: ISIS TI-16	1	2017	1	2017
Developments: ISIS APB Development: Development: ISIS TI-18	4	2017	1	2019
Developments: ISIS APB Development: Development: ISIS TI-20	4	2019	1	2021
Developments: ISIS APB Development: Development: ISIS TI-22	4	2021	1	2023
Developments: ISIS APB Development: Development: ISIS TI-24	4	2023	4	2023
Developments: TOTIM Development: TOTIM	3	2018	2	2020
Mast Procurement: LPPM (Buy): Backfit 1	2	2018	2	2018
Mast Procurement: LPPM (Buy): Backfit 2 - 4	2	2019	2	2019
Mast Procurement: TOTIM (Buy): CCM, POR 1, 2 & 3	3	2020	3	2020
Mast Procurement: TOTIM (Buy): POR 4	2	2021	2	2021
Test & Evaluation: ISIS (TI/APB): Test & Evaluation - ISIS TI-14/APB 13 ITRR	4	2017	4	2017
Test & Evaluation: ISIS (TI/APB): Test & Evaluation - ISIS TI-14/APB 13 VA IT	2	2018	2	2018
Test & Evaluation: ISIS (TI/APB): Test & Evaluation - ISIS TI-16/APB 15 VA DT	2	2019	2	2019
Test & Evaluation: ISIS (TI/APB): Test & Evaluation - ISIS TI-16/APB 15 VA OT	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0253 / *Nav & Electro-Optical Supt*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation: ISIS (TI/APB): Test & Evaluation - ISIS TI-18/APB 17 688 DT	3	2020	3	2020
Test & Evaluation: ISIS (TI/APB): Test & Evaluation - ISIS TI-20/APB 19 VA DT	3	2021	3	2021
Test & Evaluation: ISIS (TI/APB): Test & Evaluation - ISIS TI-20/APB 19 VA OT	1	2022	1	2022
Test & Evaluation: ISIS (TI/APB): Test & Evaluation - ISIS TI-22/APB 21 VA OT	2	2023	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 0676 / *Improve ID Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0676: *Improve ID Development*	41.849	5.013	2.477	2.405	-	2.405	2.335	9.646	8.768	2.482	Continuing	Continuing
Quantity of RDT&E Articles		-	1	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Reliable and secure navigation and positive identification (ID) systems are essential elements of battle management in the naval environment. In addition to providing platform identification for weapons employment, the Navy requires secure, jam resistant Identification Friend or Foe (IFF) systems for battle group air defense management and Air Traffic Control. The Improved ID Development project addresses the Mark XIIA Mode 5 and Mode S upgrades to the existing AN/UPX-29(V) Mark XII family of systems that is Joint and North Atlantic Treaty Organization interoperable. The AN/UPX-29(V) Interrogator System is comprised of the Interrogator Set AN/UPX-24(V), OE-120()/UPX Antenna Group, and Mark XII or Mark XIIA equipment such as AN/UPX-37, AN/UPX-41(C) or AN/UPX-45(C) Digital Interrogators and associated equipment. Additionally, the Improved ID Development project may include product improvements designed to be installed through upgrade and deficiency correction studies, which in turn become engineering changes to other IFF solutions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AN/UPX-29 (V) - OE-120()/UPX Antenna Tech Refresh	4.869	1.720	1.611	0.000	1.611
Articles:	-	1	-	-	-
Description: Engineering and integration development for antenna group OE-120()/UPX antenna tech refresh. Develop design studies and Analysis of Alternatives, draft specifications, and perform system development and integration efforts and support mission requirements, to include engineering investigations and Engineering Change Proposal (ECP) development to support mission readiness for IFF systems. ***FY 2018 Plans:*** Complete development of OE-120()/UPX retrofit kit. Complete qualification testing. Complete and deliver the Engineering Development Model (EDM). ***FY 2019 Base Plans:*** Establish tech-refresh configuration at In-Service Engineering Activity lab and land-based test sites. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.109M from FY 2018 to FY 2019 is due to the OE-120()/UPX development program ramping down.					
Title: Mark XIIA Mode 5 and Mode S Improvement for AN/UPX-29(V)	0.000	0.334	0.371	0.000	0.371

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0676 / *Improve ID Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
Description: Engineering, development, and integration of improvements to Mark XIIA Shipboard Identification Friend or Foe (IFF) Systems, including, but not limited to the AN/UPX-29(V) Interrogator System, which is comprised of the Interrogator Set AN/UPX-24, OE-120()/UPX Antenna Group, and Mark XII or Mark XIIA equipment such as AN/UPX-37, AN/UPX-41 or AN/UPX-45 Digital Interrogators. Funds development and integration of Mark XIIA Mode 5 and Mode Select (S) Improvements to the AN/UPX-29(V) systems on CG47, DDG51, LHD1, LPD17, LHA6, and CVN68, CVN78, and future ship classes. Correct software and performance deficiencies from Integrated Test and Operational Test, Aegis, and other Combat System Integration events to support Combat System integration with Aegis Weapon Systems (AWS), Ship Self Defense System (SSDS), Advanced Combat Direction System (ACDS), or Air Traffic Control Systems using Mark XIIA equipment to include engineering investigations, Engineering Change Proposal development, and testing. Provides core Integrated Logistics Support documentation; formalizes hardware/software configuration: finalizes technical/ design data, resolves testing anomalies, and integrates with shipboard training systems. ***FY 2018 Plans:*** Conduct AN/UPX-29(V) Interrogator System integration testing with Mode 5/Mode S capable AN/UPX-45 Digital Interrogator in preparation for deployment to Aegis and Ship Self Defense System (SSDS) platforms. Support logistics and technical data management for the OE-120()/UPX Antenna Group retrofit kit development, qualification test, and Engineering Development Model (EDM) delivery. ***FY 2019 Base Plans:*** Continue AN/UPX-29(V) Interrogator System integration testing with Mode 5/Mode S capable AN/UPX-45 Digital Interrogator in preparation for deployment to Aegis and Ship Self Defense System (SSDS) platforms. Evaluate inter-operability test data to validate planned combat system software design changes. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.037M from FY 2018 to FY 2019 is due to the software development increase for evaluation of Mode 5/Mode S interoperability test data.					
Title: AN/UPX-29(V) Management Support	0.144	0.423	0.423	0.000	0.423
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0676 / *Improve ID Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Engineering and Program Management of the AN/UPX 29 (V). Perform system integration efforts. ***FY 2018 Plans:*** Support logistics and technical data management for the AN/UPX 29 (V) Mode 5/Mode S integration and OE-120/UPX retrofit kit development, qualification test, and Engineering Development Model (EDM) delivery. ***FY 2019 Base Plans:*** Support logistics and technical data management for the AN/UPX 29 (V) Mode 5/Mode S integration. Evaluate in-service OE-120 antenna systems for maximum service life and create corresponding OE-120 retro-fit schedule. ***FY 2019 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	5.013	2.477	2.405	0.000	2.405

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2851: *ID Systems*	22.177	21.239	26.163	-	26.163	26.139	25.463	49.655	57.497	348.665	875.227

Remarks

D. Acquisition Strategy

The acquisition strategy is to develop Mode 5 Engineering Change Proposals for modern Mark XII Identification Friend or Foe (IFF) equipment and integrate into all Navy Combat Weapons systems platforms and augment the Navy's Cooperative Identification Capability to include Mode 5.

E. Performance Metrics

Achieve Full Rate Production Decision and Initial Operational Capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 0676 / *Improve ID Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	WR	NAWCAD : St Inigoes, MD	9.264	0.049	Nov 2016	0.000		1.139	Nov 2018	-		1.139	Continuing	Continuing	Continuing
Ship Integration	WR	NAWCAD : St Inigoes, MD	2.462	0.000		0.000		0.115	Nov 2018	-		0.115	0.000	2.577	-
Systems Engineering	WR	NAWCAD : St Inigoes, MD	6.229	0.000		0.000		0.357	Nov 2018	-		0.357	0.000	6.586	-
OE-120 Tech Refresh	SS/FFP	BAE : Nashua, NH	8.943	4.820	Nov 2016	1.720	Nov 2017	0.000		-		0.000	0.000	15.483	15.483
		Subtotal	26.898	4.869		1.720		1.611		-		1.611	Continuing	Continuing	N/A

Remarks

Decrease in FY19 for OE-120 Tech Refresh efforts is due to the transition from OEM to USG. Primary Hardware Development, Ship Integration, and Systems Engineering increases in FY19 are due to the transition from OEM to USG for establishment of OE-120 Tech Refresh configuration at In-Service Engineering Activity (ISEA) and Land Base Test Site (LBTS) labs.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NAWCAD : St Inigoes, MD	0.169	0.000		0.000		0.075	Nov 2018	-		0.075	0.000	0.244	-
ILS	WR	NAWCAD : St Inigoes, MD	2.547	0.000		0.239	Nov 2017	0.000		-		0.000	0.000	2.786	-
Software Development	WR	NAWCAD : St Inigoes, MD	5.535	0.000		0.000		0.197	Nov 2018	-		0.197	0.000	5.732	-
Technical Data	WR	NAWCAD : St Inigoes, MD	1.874	0.000		0.095	Nov 2017	0.099	Nov 2018	-		0.099	0.000	2.068	-
Training	WR	NAWCAD : St Inigoes, MD	0.200	0.000		0.000		0.000		-		0.000	0.000	0.200	-
Engineering	WR	NAWCAD : PAX River, MD	0.244	0.000		0.000		0.000		-		0.000	0.000	0.244	-
		Subtotal	10.569	0.000		0.334		0.371		-		0.371	0.000	11.274	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 0676 / *Improve ID Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Software development cost increases for evaluation of Mode 5/Mode S interoperability test data from combat system software design changes.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : St Inigoes, MD	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Operational Test & Evaluation	WR	NAWCAD : St Inigoes, MD	1.328	0.000		0.000		0.000		-		0.000	0.000	1.328	-
Test Assets	WR	NAWCAD : St Inigoes, MD	0.731	0.000		0.000		0.000		-		0.000	0.000	0.731	-
		Subtotal	2.559	0.000		0.000		0.000		-		0.000	0.000	2.559	N/A

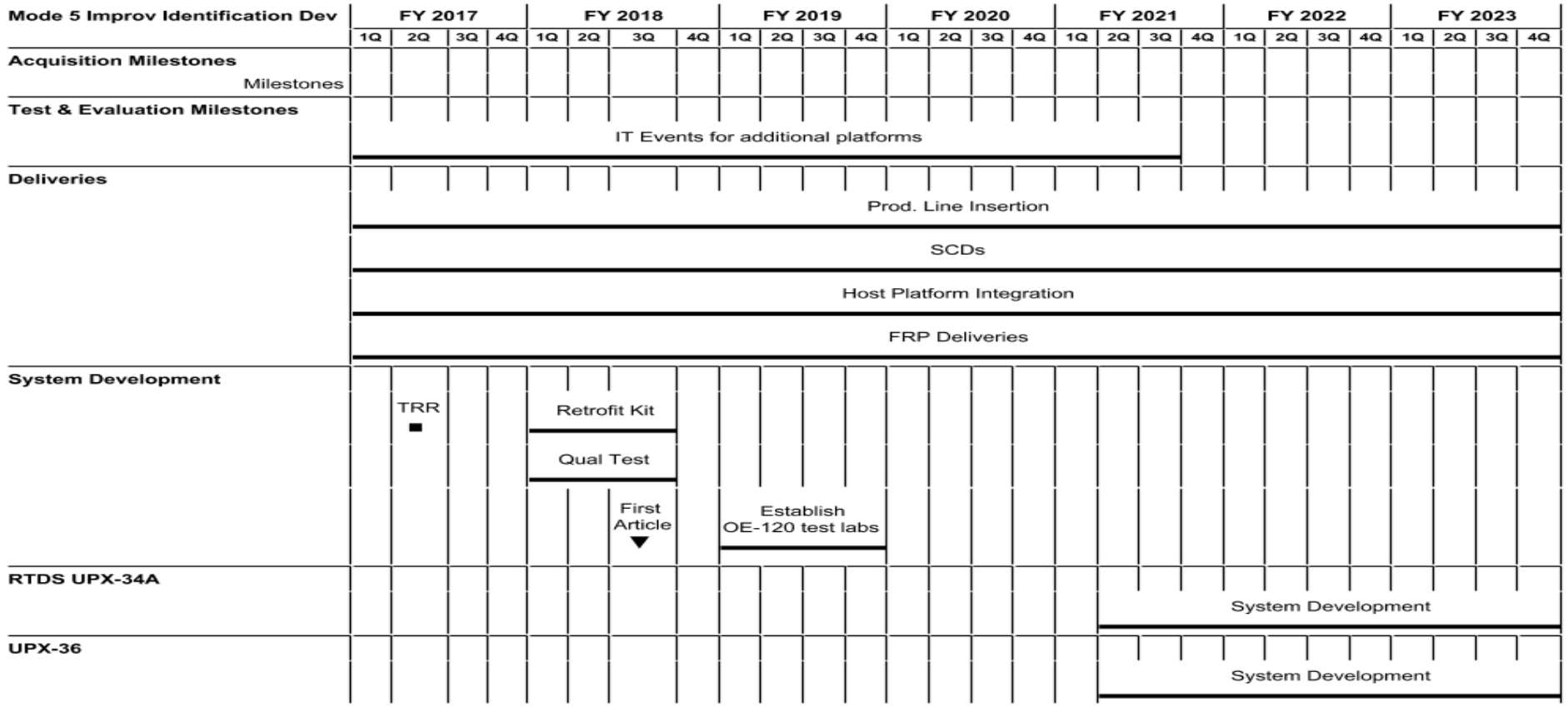
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPFF	American Electronics : California, MD	1.823	0.144	Nov 2016	0.423	Nov 2017	0.423	Nov 2018	-		0.423	0.000	2.813	2.813
		Subtotal	1.823	0.144		0.423		0.423		-		0.423	0.000	2.813	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	41.849	5.013		2.477		2.405		-		2.405	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0676 / *Improve ID Development*



2019PB - 0604777N - 0676

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0676 / *Improve ID Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Mode 5 Improv Identification Dev				
Test & Evaluation Milestones: IT Events for additional platforms	1	2017	3	2021
Deliveries: Mode 5 - Production Line Insertion	1	2017	4	2023
Deliveries: Mode 5 - Prepare and Evaluate ECPs/SCDs	1	2017	4	2023
Deliveries: Mode 5 - Host Platform Integrations	1	2017	4	2023
Deliveries: Mode 5 - FRP Deliveries	1	2017	4	2023
System Development: TRR	2	2017	2	2017
System Development: Retrofit Kit	1	2018	3	2018
System Development: Qual Test	1	2018	3	2018
System Development: OE-120 Tech Refresh First Article Delivery	3	2018	3	2018
System Development: Establish ISEA and LBTS OE-120 tech refresh labs.	1	2019	4	2019
RTDS UPX-34A: System Development (UPX-34A ECP)	2	2021	4	2023
UPX-36: System Development (UPX-36 ECP)	2	2021	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 0921 / *NAVSTAR GPS Equipment*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0921: *NAVSTAR GPS Equipment*	281.975	23.668	80.044	80.675	-	80.675	97.814	52.298	36.807	25.645	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Navigation Satellite Timing & Ranging (NAVSTAR) Global Positioning System (GPS) project (0921) is a space-based Positioning, Navigation, and Timing (PNT) system that provides authorized users with secure, worldwide, all weather, three dimensional position, velocity, and precise time data. This project is comprised of four distinct efforts: Air and Sea Navigation Warfare (NAVWAR), GPS-based PNT Service (GPNTS), and GPS Modernization. Research, Development, Testing and Evaluation (RDT&E) funds are used to perform all the non- recurring GPS Surface Ship, Submarine and Aircraft Development, Integration, and Testing efforts in support of NAVSTAR GPS.

The Air and Sea NAVWAR programs were established to provide continued access to GPS information in a denied or impeded electronic environment. Development efforts for both programs provide improvements to various platform type antennas and ensure compatibility with the new Military Code (M-Code) signal. The Air NAVWAR program continues integration efforts using GPS Antenna System (GAS-1), Advanced Digital Antenna Production (ADAP), and other anti-jam antennas on air platforms while investigating smaller anti-jam antennas for space constrained platforms and aircraft with unique requirements. The Sea NAVWAR program integrates Anti-Jam (AJ) antennas onto surface and subsurface platforms. The Sea NAVWAR program will continue to research the viability and development of smaller anti-jam antennas for space-constrained platforms. The program continues to support the Submarine Anti-Jam GPS Enhancement (SAGE) antenna development which integrates AJ capability into the submarine Multi-Function Mast (OE-538B) antenna system.

The GPNTS system is being developed to serve as the primary PNT system for the Navy to ensure reliable PNT capability and interoperability insertion into GPS receivers and associated Command, Control, Computers, Communications and Intelligence (C4I), and Combat Systems in a denied environment. GPNTS provides precise PNT data required for combat, weapons, command, control, communications, navigation, and other systems, as well as providing the time synchronization critical to the network environments. GPNTS will back fit current PNT/GPS systems as well as serve as a forward fit for new platforms. GPNTS will host the GPS Directorate-developed Military GPS User Equipment (MGUE) card, allowing access to the new GPS M-Code signal. GPNTS will provide more robust and secure GPS/PNT capabilities than is currently in the Fleet. The system will provide the capability to migrate non-real time GPS data toward a Common Computing Environment (CCE), such as Consolidated Afloat Networks Enterprise Services (CANES), and provide a path for the integration of advanced navigation systems and sensors. GPNTS provides Assured PNT (A-PNT) capability to Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR) and Combat Systems in standalone and networked architectures throughout maritime domains.

GPS continues to be integrated in all DoD platforms and the development of enhanced and protected GPS is a national security priority. GPS Modernization executes the Navy's integration of Military GPS User Equipment (MGUE) being developed by the Air Force GPS Directorate. This effort provides Navy platforms improved access to GPS signals in challenged and jamming environments. Because of the number and diversity of all of the Navy's air, surface, subsurface, and weapons platforms, this project will consist of multiple parallel efforts across many program offices with central coordination and management of funding and priorities by GPS Modernization. Modernized GPS receivers will utilize the new M-Code GPS Signal in Space, incorporate enhanced cryptology, deliver greater position and time accuracy, and provide

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

improved protection against signal spoofing as compared to legacy receivers. Additionally, GPS Modernization delivers increased GPS AJ protection and enables blue force GPS electronic attack. This effort supports Navy compliance with Public Law 111-383 which prohibits spending funds on non-M-Code GPS user equipment after FY 2017.

FY19 growth in Global Positioning System (GPS) Modernization is to continue GPS integration efforts for surface platforms and seven (7) air platforms: F/A-18E/F, EA-18G, E-2D, MV-22B, CMV-22B, CH-53K, and KC-130J. Each platform has a unique configuration, which requires separate parallel efforts to integrate and test the modernized GPS receiver into each platform, individual prime vendor contracts, and coordination with each Air program office to include management, oversight and support of the effort. To meet the Navy's schedule, efforts must begin before actual delivery of Military GPS User Equipment (MGUE) products from the Air Force.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Air Navigation Warfare (NAVWAR)	2.208	13.237	8.195	0.000	8.195
Articles:	-	-	-	-	-
Description: Air Navigation Warfare (NAVWAR) provides the Warfighter continued access to GPS through the use of anti-jam (AJ) Antenna Systems designed to counter GPS Electronic Warfare threats due to intentional and unintentional interference. Air NAVWAR efforts include investigation and testing of emerging technologies to improve anti-jam capability and technologies such as development of miniaturized very small antenna systems to allow for the capability on small variant aircraft. Efforts will also include development to ensure antennas can accept the new Military Code (M-Code) signal.					
FY 2018 Plans: The $11M increase in funding is to integrate Anti-Jam (AJ) antennas into select aviation platforms and to fund development and integration of miniaturized anti-jam antennas in AH-1Z, UH-1Y helicopters, MQ-4C, and MQ-8B/C air platforms. Efforts require ramp up of systems engineering to include integration studies; Non-Recurring Engineering (NRE) for platform interface modifications; Global Positioning System (GPS) antenna test articles; integration testing; test plan development and updates; test support, analysis and reporting; and increased engineering support staff. Efforts will commence to determine air platform specific requirements and determine if existing solutions are available or a new solution needs to be developed. Initiate developmental test effort for common solution for H-1 helicopter variants to include the AH-1Z and UH-1Y. Start integration of solution on platform with Power test, Environmental test, Weapons Replaceable Assembly (WRA) Box-Level Electromagnetic Interference (EMI) Test, and System-Level EMI Tests. Begin integration of AJ capability and upgrade main operation software to incorporate secure Y-Mode functionality for MV-22, E-2D and MQ-8B/C Fire Scout platforms.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Design antenna solution. Conduct laboratory testing of GPS receivers with associated antennas at Facilities for Antenna and Radar Cross Section (RCS) Measurements (FARM). Continue to assist other air platforms with integration of Anti-Jam (AJ) capable antennas to include Unmanned Aircraft Systems (UAS) and E-2D. Conduct testing of small form factor AJ solution. Continue Navigation Warfare (NAVWAR) AJ demonstrations for unmanned platforms, work on miniaturized NAVWAR Anti-Jam antenna solutions, and assist new unmanned vehicles with navigation issues. Continue efforts to assist with coordination of E-2D platforms with AJ capable antennas in conjunction with a refueling probe upgrade. Continue to lead Aviation Assured-Position, Navigation and Timing (A-PNT) efforts by working with Navy Air platforms on future navigation requirements and coordinating with surface Navy platforms to leverage synergies. Continue development of Aviation Position, Navigation and Timing (PNT) Capabilities Based Assessment (CBA) and determine Assured Position Velocity and Timing (APVT) requirements for E-2D and P-8A aircraft. Continue to assist the Fleet with Global Positioning System (GPS) Enterprise Selective Availability Anti-Spoofing Module (SAASM) and Architecture Evolution Plan (AEP) developments, providing subject matter expertise to NAVAIR platforms for SAASM integration and monitor future GPS Directorate SAASM upgrades. Continue to participate in joint NAVWAR Memorandum of Understanding (MOU) initiatives with Canada, United Kingdom and Australia to meet Office of the Secretary of Defense (OSD) initiatives. ***FY 2019 Base Plans:*** Continue to integrate AJ antennas into select aviation platforms and to fund development and integration of miniaturized AJ antennas in AH-1Z, UH-1Y helicopters, MQ-4C, and MQ-8B/C Fire Scout air platforms. Perform systems engineering to include integration studies; follow on testing to resolve discrepancies; Non-Recurring Engineering (NRE) for platform interface modifications; integration testing; test plan development and updates; test support, analysis and reporting; and increased engineering support staff. Efforts will continue to determine air platform specific requirements and solutions. Continue developmental test effort to identify a common solution for H-1 helicopter variants to include the AH-1Z and UH-1Y. Continue integration of solution on platforms to resolve deficiencies through follow on testing					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
including Power test, Environmental test, Weapons Replaceable Assembly (WRA) Box-Level Electromagnetic Interference (EMI) Test, and System-Level EMI Tests. Continue developmental effort for AJ capability on MQ-8B and MQ-8C to include hardware integration of solution on platform and software testing for safety of flight certification. Continue effort to upgrade main operation software including development, integration and laboratory testing to incorporate Y-Only mode functionality for MV-22, E-2D, and MQ-8B/C Fire Scout platforms. Conduct in flight testing of Global Positioning System (GPS) receivers with associated antennas at Facilities for Antenna and Radar Cross Section (RCS) Measurements (FARM). Continue efforts to assist with coordination of E-2D platforms with Anti-Jam (AJ) capable antennas in conjunction with a refueling probe upgrade. Continue to support Aviation Assured-Position, Navigation and Timing (A-PNT) efforts by working with Navy Air platforms on navigation requirements and coordinating with surface Navy platforms to leverage synergies. Finalize Aviation Position, Navigation and Timing (PNT) Capabilities Based Assessment (CBA) and determine Assured Position Velocity and Timing (APVT) requirements for F/A-18E/F, MQ-4C and H-60 aircraft according to the OPNAV N2N6 guidance and prioritization. Continue to assist the Fleet with GPS Enterprise Selective Availability Anti-Spoofing Module (SAASM) and Architecture Evolution Plan (AEP) developments, providing subject matter expertise to NAVAIR platforms for SAASM integration and monitor future GPS Directorate SAASM upgrades. Continue to participate in joint Navigation Warfare (NAVWAR) Memorandum of Understanding (MOU) initiatives with Canada, United Kingdom and Australia to meet Office of the Secretary of Defense (OSD) initiatives. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding decrease from FY 2018 to FY 2019 is due to procurement of multiple test articles and systems engineering efforts that began labor intensive Non-Recurring Engineering (NRE) efforts and integration efforts in FY 2018. FY 2019 funding supports NRE updates and follow on testing to resolve discrepancies.					
Title: Sea Navigation Warfare (NAVWAR)	8.169	6.109	2.870	0.000	2.870
Articles:	-	-	-	-	-
Description: Sea Navigation Warfare (NAVWAR) provides the Warfighter continued access to GPS through the use of AJ Antenna Systems designed to counter GPS Electronic Warfare threats due to intentional and unintentional interference on surface and subsurface platforms through the continued development of anti-jam antennas. The program is continuing the Submarine Anti-Jam Global Positioning System (GPS) Enhancement (SAGE) antenna development, which integrates Anti-Jam (AJ) capability into the submarine Multi-Function Mast (OE-538B). Sea Navigation Warfare (NAVWAR) will continue to research the viability and development of smaller AJ antennas for platforms with Size, Weight and Power (SWaP) restrictions and ensure compatibility with the Military Code (M-Code) signal.					
FY 2018 Plans: Continue to provide government oversight, system engineering, logistics, contracts, and programmatic management efforts for SAGE and integration into the OE-538B antenna system development. Complete Test Readiness Review (TRR), OE-538B production representative article (PRA) factory acceptance testing and conduct Functional Configuration Audit (FCA). Complete Radio Frequencies Distribution and Control System (RFDACS) development and integration with OE-538B PRA. Accept delivery of OE-538B PRA and conduct Government Acceptance Test. Conduct OE-538B PRA laboratory developmental testing with RFDACS. Commence the following First Article Qualification Testing (FAQT) of SAGE and OE-538B antenna system: - Radio Frequency (RF) Characterization - Structure Borne Noise (SBN) - Electromagnetic Interference (EMI) - Vibration					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Electromagnetic Pulse (EMP)/High Altitude Electromagnetic Pulse (HEMP) - Thermal - Electromagnetic Environmental Effects (E3) - Underwater Explosion (UNDEX) Commence efforts for the OE-538B Physical Configuration Audit and development of OE-538B Technical Manual, I-Level Factory Training, and Factory Maintenance Demonstration. Complete Engineering Change (EC) process for implementation of the OE-538B antenna system on all submarine classes. Commence preparation for submarine Multi-Function Mast (OE-538B) Developmental Testing/Operational Testing (DT/OT) on operational submarine classes. Continue studies and begin analysis on smaller Anti-Jam antennas to meet requirements for Size, Weight, and Power (SWaP) restricted platforms. Continue to participate in joint Navigation Warfare (NAVWAR) Memorandum of Understanding (MOU) initiatives with Canada, United Kingdom and Australia to meet Office of the Secretary of Defense (OSD) initiatives. OCO: N/A. ***FY 2019 Base Plans:*** Complete government oversight, system engineering, logistics, contracts, and programmatic management efforts for the Submarine Anti-Jam GPS Enhancement (SAGE) and integration into the OE-538B antenna system development. Conduct OE-538B Developmental Testing/Operational Testing (DT/OT) on operational submarine classes. Commence and obtain fielding decision for full implementation of OE-538B antenna system. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease from FY 2018 to FY 2019 is due to conducting final stages of development, integration testing and documentation of SAGE and OE-538B antenna system in FY 2018. FY 2019 funding supports Developmental Testing/Operational Testing (DT/OT) on operational submarine classes and completion of system engineering and programmatic support to obtain OE-538B Fielding Decision for full implementation of the antenna system.					
Title: Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS) ***Articles:*** ***Description:*** GPNTS is the Navy's next generation Positioning, Navigation, and Timing (PNT) system. GPNTS will provide more robust and secure GPS/PNT capabilities than is currently in the Fleet. GPNTS will replace Navigation Sensor System Interface (NAVSSI) and WRN-6 systems on surface ships. The system contains Selective Availability Anti-spoofing Security Module (SAASM) GPS security architecture with a planned migration to GPS Military Code (M-Code). ***FY 2018 Plans:*** The $8M increase in funding is for: 1) additional developmental efforts in preparation for Initial Operational Test and Evaluation (IOT&E), 2) development of the Pre-planned Product Improvement (P3I) technology, 3) development of a single rack solution for smaller surface combatant platforms, and 4) development of a Global Positioning System (GPS)-Based Positioning, Navigation and Timing (PNT) Service (GPNTS) configuration to meet unique requirements for Frigate (FFG-(X)), formerly known as Littoral Combat Ship (LCS) platforms. Begin development of GPNTS P3I technology insertion for software enhancements for Assured-Positioning, Navigation, and Timing (A-PNT) sensor suite integration to include, but not limited to: All Source Position Navigation (ASPN) algorithm, Celestial Navigation, Two Way Satellite Time Transfer (TWSTT), Public Key Infrastructure (PKI), Host-Based Security System (HBSS). ASPN, Celestial Navigation, and TWSTT are developments to address emerging threats to the GPS signal in a GPS denied environment. PKI and HBSS provide secure cybersecurity architecture to the GPNTS system to comply with Navy Cybersecurity mandates. Commence the design, build, integration, and test of a GPNTS one rack solution for smaller surface combatant platforms to include Dock Landing Ship, United States Coast Guard, patrol crafts, Mine Countermeasure,and Military Sealift Command platforms.	5.497 -	17.689 -	16.625 -	0.000 -	16.625 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Commence the requirements analysis and initiate the design and development of a GPNTS configuration modification for the FFG-(X) platforms to replace the currently installed commercial navigation systems. Begin development, assembly, and implementation of a Navigation Simulator and Advanced GPS Navigation Simulator tool required for testing and integration of the GPNTS system with all Combat Systems interfaces to support IOT&E. Continue to resolve GPNTS software defects discovered during Operational Assessment prior to formal IOT&E. Continue preparations and coordination of efforts with Commander, Operational Test and Evaluation Force (COMOPTEVFOR) and the Joint Interoperability Test Command (JITC) to support GPNTS Navigation Certification, Technical Evaluation, Combat Systems Certification and IOT&E onboard the test platforms. Continue to develop the GPNTS software in support of IOT&E. Continue development of Initial Operational Test and Evaluation (IOT&E) documentation to include test plan, test procedures, and System Operational Verification Test (SOVT) documentation. Conduct GPNTS Aegis Integration Event (AIE) activities at Wallops Island, VA, to ensure compatibility with specific Aegis Combat System baselines. The AIE is required prior to the installation of GPNTS on the Aegis capable DDG IOT&E platform and prior to fielding on platforms with Aegis capability (DDGs and CGs). ***FY 2019 Base Plans:*** Resolve remaining software defects on the Global Positioning System (GPS)-Based Positioning, Navigation and Timing (PNT) Service (GPNTS) software prior to commencing IOT&E. Commence the implementation of GPNTS Pre-planned Product Improvement (P3I) technology software enhancements for Assured-Positioning, Navigation, and Timing (A-PNT) sensor suite integration to include: All Source Position Navigation (ASPN) algorithm, Celestial Navigation, Two Way Satellite Time Transfer (TWSTT), Public Key Infrastructure (PKI), Host-Based Security System (HBSS). ASPN, Celestial Navigation, and TWSTT address emerging threats to the GPS signal in a GPS-denied environment. PKI and HBSS provide secure cybersecurity architecture to the GPNTS system to comply with OPNAV Cybersecurity mandates.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Begin integration of the Office of Naval Research (ONR) developed capability, Non-GPS Aided Positioning for Surface and Subsurface (NoGAPSS), into the GPNTS software baseline. The NoGAPSS capability provides additional resiliency for Assured-Positioning, Navigation, and Timing (A-PNT) data required for combat systems, weapons, navigation, command, control, communications, and other systems, as well as providing the time and frequency synchronization critical to the network infrastructure in a GPS interference or denied environment. Obtain an Authority to Operation (ATO) from the Navy Authorization Office (NAO) in order to install and operate a GPNTS system onboard a Navy ship. Conduct GPNTS Technical Evaluation prior to IOT&E. Conduct GPNTS IOT&E for two rack solution. Conduct Navigation Certification following IOT&E on program selected platforms. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease from FY 2018 to FY 2019 is due to preparation for Initial Operational Test and Evaluation (IOT&E)efforts in FY 2018. FY 2019 funding supports actual IOT&E event and commencement of software enhancement efforts to support Assured-Positioning, Navigation, and Timing (A-PNT) resiliency.					
Title: Global Positioning System (GPS) Modernization	7.794	43.009	52.985	0.000	52.985
Articles:	-	-	-	-	-
Description: Global Positioning System (GPS) Modernization funds the Navy's integration of Military GPS User Equipment (MGUE), specifically Military Code (M-Code) capable GPS receivers, being developed by the Air Force GPS Directorate into various receivers on Navy air and sea platforms. Integration of these receivers addresses emerging threats to GPS by securing access to the new GPS M-Code signal. This effort supports Navy's compliance with Public Law 111-383, which requires that all GPS user equipment be capable of receiving the new GPS M-Code signal after FY 2017. This project is the Navy's single voice on providing service requirements to Air Force receiver development programs and coordinate Navy reviews of Air Force GPS receiver documentation. Tasking includes overall centralized planning, coordination and budgeting of the non-recurring engineering required to conduct systems					

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
engineering, integration, and testing for multiple platforms. This effort includes use of core expertise and government engineers from multiple Navy platform program offices to conduct systems engineering, provide review and oversight of prime vendor engineering documents, and develop government test plans. The integration timeline is 5+ years from planning to test and is dependent on platform type. For aircraft integration, GPS M-Code capable receivers will be procured through existing Air Force Joint Services System Management Office (JSSMO) contracts and integrated on Navy platforms using Prime Vendor contracts held by each platform's program office. Each platform uses a unique GPS receiver requiring individual parallel efforts to integrate MGUE into each specific receiver. Each receiver integration effort requires a separate team to address the unique requirements. Additionally, each platform has a unique GPS system configuration, which requires separate parallel efforts to integrate and test the modernized GPS receiver into each platform, to include coordination with each Program Management Air (PMA) organization; management, oversight and support of the effort; and contracting and working with the identified Prime Vendor for the platform. To meet the Navy's mandate, system engineering and requirement development efforts must begin before actual delivery of MGUE. ***FY 2018 Plans:*** The increase in funding is to begin integration of Military Code (M-Code) capable Global Positioning System (GPS) receivers and start government systems engineering and contracting efforts for four (4) additional air platforms: MV-22B, CMV-22B, CH-53K, KC-130J as well as continue modernization efforts for three (3) air platforms : F/A-18E/F, EA-18G, and E-2D. Award Prime Vendor GPS contracts for platform integration and test efforts, and procure production ready unit (PRU) test articles for platform integration and test activities. The increase is also required to start integration of M-Code capable GPS receivers and small anti-jam antenna systems into Size Weight and Power and Cost (SWaP-C) constrained Surface Platforms that cannot accept Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Service (GPNTS). These efforts require separate teams to work with the four (4) GPS receiver vendors, five (5) Air program office organizations, Military Sea Lift Command (MSC), and five (5) Prime Vendors contracts to integrate and test the modernized GPS receiver for each platform. Begin GPS Modernization integration efforts on four (4) additional air platforms: MV-22B, CMV-22B, CH-53K, and KC-130J. - Initiate development of requirements and systems engineering efforts for integrating M-Code GPS receivers into the airframe and aircraft software. - Develop and implement process to integrate M-Code capability into platform receiver and to test modernized receiver into platform.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Procure test article receivers to provide production representative M-Code receivers for laboratory and flight testing for two (2) air platforms: MV-22B and CMV-22B. - Begin procurement planning process, award contracts, and commence efforts for integration of M-Code into receiver for two (2) air platforms: MV-22B and CMV-22B. - Begin procurement planning process to award M-Code receiver integration contracts for two (2) air platforms: CH-53K, and KC-130J. - Provide overarching management, central coordination, government oversight and guidance, shared expertise, and engineering support to ensure Naval platform performance and integration requirements are supported during integration of M-Code capable receiver into the platform. Begin GPS Modernization integration efforts on SWaP-C constrained MSC surface platforms. - Obtain acquisition authority to provide M-Code GPS Receiver with small Anti-Jam (AJ) Antenna system solution for SWaP-C constrained surface platforms. - Procure M-Code GPS Receiver and small AJ Antenna test assets. - Conduct platform requirement analysis including site surveys of targeted platforms, small Anti-Jam Antenna top side studies, and development of installation and related documentation. - Perform risk reduction integration and performance characterization testing of M-Code GPS Receiver and small AJ Antenna system Continue Global Positioning System (GPS) Modernization integration efforts on three (3) air platforms: F/A-18E/F, EA-18G, and E-2D. - Continue development of requirements and systems engineering efforts for integrating Military Code (M-Code) GPS receivers into airframe and aircraft software. - Procure test articles for laboratory and flight testing for all three (3) air platforms. - Complete hardware and software M-Code integration risk reduction studies. - Award contracts and commence efforts for integration of M-Code into receiver for all three (3) air platforms. - Provide overarching management, central coordination, government oversight and guidance, shared expertise, and engineering support to ensure Naval platform performance and integration requirements are supported during M-Code receiver development and integration into the platform. ***FY 2019 Base Plans:*** The increase in FY19 funding is to ramp up GPS Modernization efforts for CH-53K aircraft to include hardware/software Customization of the M-Code Receiver and award prime vendor contract to commence M-Code receiver integration into the aircraft. Continue GPS Modernization integration and test efforts for surface					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
platforms, seven (7) air platforms: F/A-18E/F, EA-18G, E-2D, MV-22B, CMV-22B, CH-53K, and KC-130J and procure PRU test articles for certain air platform integration and test activities. These efforts require separate teams to work with four (4) GPS receiver vendors, five (5) Air program office organizations, Military Sea Lift Command, and six (6) aircraft Prime Vendors contracts to integrate and test the modernized GPS receiver for each platform. Continue GPS Modernization efforts on the following five (5) air platforms: F/A-18E/F, EA-18G, E-2D, MV-22B and CMV-22B which have procured test articles and awarded prime vendor integration efforts: - Finalize cybersecurity requirements and Software Statement of Requirements (SOR) - Conduct systems engineering and technical reviews (SETR) including Systems Requirements Review (SRR) and Preliminary Design Review (PDR) - Perform Non-recurring Engineering (NRE) efforts and software updates required for the design and testing of M-Code GPS receivers in support of developmental and operational test events. - Provide overarching management, central coordination, government oversight and guidance, shared expertise, and engineering support to ensure aircraft performance and integration requirements are supported during M-Code receiver development. Continue GPS Modernization efforts on the following two (2) air platforms: CH-53K, and KC-130J - Development of requirements and systems engineering efforts for integrating Military Code (M-Code) Global Positioning System (GPS) receivers into the airframe and aircraft software. - Continue process to integrate M-Code capability into platform receiver and to test modernized receiver into platform. - Procure Embedded GPS/INS (Global Positioning System/Inertial Navigation System) (EGI) test article receivers to provide production representative M-Code receivers for laboratory and flight testing for CH-53K air platform. - Award contracts and commence integration of M-Code into receiver CH-53K air platform. - Provide overarching management, central coordination, government oversight and guidance, shared expertise, and engineering support to ensure aircraft performance and integration requirements are supported during M-Code receiver development. Continue GPS Modernization efforts for Size Weight and Power and Cost (SWaP-C) constrained Military Sealift Command (MSC) surface platforms: - Begin Environment Qualification Testing of M-Code GPS Receiver and small Anti-Jam (AJ) Antenna system.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Perform land based Anti-Jam and Anti-Spoof performance testing of M-Code GPS Receiver and small AJ Antenna system. - Perform platform specific integration testing. ***FY 2019 OCO Plans:*** OCO: N/A. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase to GPS Modernization funding requirements in FY 2019 supports multiple software intensive updates and non-recurring engineering services specifically for F/A-18E/F, EA-18G and E-2D air platforms for the integration of M-Code capable GPS receivers. FY19 funding also supports a full year of integration, government systems engineering and software development efforts for the integration of M-Code capable GPS receivers for surface ship platforms and seven (7) air platforms: F/A-18E/F, EA-18G, E-2D, MV-22B, CMV-22B, CH-53K, and KC-130J.					
Accomplishments/Planned Programs Subtotals	23.668	80.044	80.675	0.000	80.675

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2657: *NAVSTAR GPS Receivers (Space)*	7.102	15.923	10.703	-	10.703	32.733	33.815	30.060	23.037	Continuing	Continuing
• APN/0577: *Common Avionics Changes*	7.091	7.417	7.543	-	7.543	8.118	9.469	11.935	34.508	402.100	872.249

Remarks

D. Acquisition Strategy

Both the Navigation Warfare (NAVWAR) Air and Sea programs will continue to integrate improved anti-jam (AJ) capability onto air and sea platforms and ensure compatibility with new Military Code (M-Code) signal.

GPS-based Positioning, Navigation, and Timing (PNT) Service (GPNTS) program will develop, acquire, and field the GPNTS, a scalable Selective Availability/Anti-Spoofing Module (SAASM) GPS-based service-oriented architecture PNT system that will provide an open, extensible, modernized replacement for the current fleet PNT systems, GPNTS will also integrate Military GPS User Equipment (MGUE). A firm fixed price contract is planned for an FY 2017 award to procure LRIP and FRP systems.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

GPS Modernization will manage the non-recurring engineering required to conduct systems engineering, integration and test of Air Force GPS Directorate developed MGUE receivers. Existing platform hardware contracts and support infrastructure will be utilized to complete integration efforts by Air platform.

E. Performance Metrics

The primary metric used for the Air Navigation Warfare (NAVWAR) Program is acceptable system performance in a Global Positioning System (GPS) denied environment which is defined by classified values of jamming to signal ratio (J/S) identified in the Enhanced GPS User Equipment (UE) Operational Requirements Document (ORD) 562-06-00 of 7 June 2000. The performance goal is met if acceptable system performance is achieved in the threshold J/S environment cited in the classified appendix.

The primary metric used for the Sea NAVWAR is acceptable system performance in a GPS denial environment defined by classified values of jamming to J/S identified in the Sea NAVWAR Increment 2 Capabilities Production Document (CPD) (12/08). The performance goal is met if acceptable system performance is achieved in the threshold J/S environment cited in the CPD.

The primary metric used for the GPS-based Positioning, Navigation and Timing (PNT) Service (GPNTS) is successful completion of the system development as outlined in the GPNTS Technical Requirements Document (TRD).

The primary metric used for the GPS Modernization is successful completion of the system development as outlined in the Project Definition Document (PDD) for GPS Modernization.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 0921 / *NAVSTAR GPS Equipment*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air NAVWAR Development Support	WR	NAWC : Pax River, MD	0.000	0.266	Dec 2016	2.215	Nov 2017	2.000	Nov 2018	-		2.000	Continuing	Continuing	Continuing
Air NAVWAR Govt Eng Support	WR	NAWC : Pax River, MD	0.000	0.406	Dec 2016	2.566	Dec 2017	2.250	Dec 2018	-		2.250	Continuing	Continuing	Continuing
Sea NAVWAR Development	C/CPIF	Lockheed : Marion, MA	4.031	5.200	Dec 2016	2.330	Oct 2017	0.000		-		0.000	0.000	11.561	-
Sea NAVWAR Development Support	WR	SSC PAC, NUWC : San Diego, Newport	0.000	0.924	Dec 2016	1.484	Dec 2017	0.800	Dec 2018	-		0.800	Continuing	Continuing	Continuing
Sea NAVWAR Govt Eng Support	WR	SSC PAC, NUWC : San Diego, Newport	0.000	1.401	Dec 2016	0.345	Dec 2017	0.283	Dec 2018	-		0.283	Continuing	Continuing	Continuing
GPNTS HW / SW Development	C/CPIF	Raytheon : San Diego, CA	37.364	2.224	Nov 2016	5.000	Nov 2017	0.000		-		0.000	0.000	44.588	-
GPNTS SW / NoGAPSS Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		7.800	Dec 2018	-		7.800	Continuing	Continuing	Continuing
GPNTS Development Support	WR	SSC PAC : San Diego, CA	0.000	0.725	Dec 2016	2.658	Dec 2017	1.500	Dec 2018	-		1.500	Continuing	Continuing	Continuing
GPNTS Govt Eng Support	WR	SSC PAC : San Diego, CA	0.000	1.105	Dec 2016	4.750	Dec 2017	2.456	Dec 2018	-		2.456	Continuing	Continuing	Continuing
GPS Mod Development F/A-18E/F	C/CPIF	Boeing : St Louis, MO	0.000	0.000		4.075	Apr 2018	11.800	Apr 2019	-		11.800	Continuing	Continuing	Continuing
GPS Mod Development EA-18G	C/CPIF	Boeing : St Louis, MO	0.000	0.000		4.075	Apr 2018	12.779	Apr 2019	-		12.779	Continuing	Continuing	Continuing
GPS Mod Development E-2D	C/CPIF	Northup Gruman : Pax River, MD	0.000	0.000		2.000	Apr 2018	1.900	Apr 2019	-		1.900	Continuing	Continuing	Continuing
GPS Mod Development MV-22B,CMV-22B	C/CPIF	Bell Boeing : Amarillo, TX	0.000	0.000		1.250	Jun 2018	3.800	Jun 2019	-		3.800	Continuing	Continuing	Continuing
GPS Mod Development CH-53K	C/CPIF	Sikorsky : Stratford, CT	0.000	0.000		0.000		1.050	Apr 2019	-		1.050	Continuing	Continuing	Continuing
GPS Mod Hardware F/A-18E/F	C/FFP	Raytheon : El Segundo, CA	0.000	2.200	Aug 2017	0.000		0.000		-		0.000	0.000	2.200	-
GPS Mod Hardware EA-18G	C/FFP	TBD : TBD	0.000	0.000		1.960	Feb 2018	0.000		-		0.000	0.000	1.960	-
GPS Mod Hardware E-2D	C/FFP	TBD : TBD	0.000	0.000		2.900	Feb 2018	0.000		-		0.000	0.000	2.900	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GPS Mod Hardware MV-22B,CMV-22B	C/FFP	TBD : TBD	0.000	0.000		0.800	Mar 2018	0.000		-		0.000	0.000	0.800	-
GPS Mod Hardware CH-53K	C/FFP	TBD : TBD	0.000	0.000		0.000		1.000	Dec 2018	-		1.000	Continuing	Continuing	Continuing
GPS Mod Hardware MSC	C/FFP	TBD : TBD	0.000	0.000		1.500	Mar 2018	0.000		-		0.000	0.000	1.500	-
GPS Mod Development Support	WR	SSC PAC, NAWC : San Diego, Pax River	0.000	1.000	Jan 2017	10.308	Nov 2017	0.500	Nov 2018	-		0.500	Continuing	Continuing	Continuing
GPS Mod Govt Eng Support	WR	SSC PAC, NAWC : San Diego, Pax River	0.000	1.755	Jan 2017	7.061	Nov 2017	2.920	Nov 2018	-		2.920	Continuing	Continuing	Continuing
Product Development	WR	GPS Directorate : Los Angeles, CA	4.424	0.500	Dec 2016	1.300	Dec 2017	1.700	Dec 2018	-		1.700	Continuing	Continuing	Continuing
Systems Engineering	WR	Govt, Contractor : San Diego, Newport	23.659	0.150	Nov 2016	0.700	Nov 2017	0.750	Nov 2018	-		0.750	Continuing	Continuing	Continuing
Product Development	TBD	Various : Various	92.033	0.000		0.000		0.000		-		0.000	0.000	92.033	-
		Subtotal	161.511	17.856		59.277		55.288		-		55.288	Continuing	Continuing	N/A

Remarks

FY19 increase in funding requirements is to continue development, test and integration of Military Code (M-Code) capable Global Positioning System (GPS) receivers for surface platforms and seven (7) air platforms: F/A-18E/F, EA-18G, E-2D, MV-22B, CMV-22B, CH-53K, and KC-130J in support of GPS Modernization.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Engineering Services	WR	BAH : San Diego, Pax River, China Lake	0.000	0.700	Nov 2016	1.830	Nov 2017	2.700	Nov 2018	-		2.700	Continuing	Continuing	Continuing
Enginering Services	WR	SSC PAC, NAWC : San Diego, Pax River	0.000	0.000		1.875	Nov 2017	4.310	Nov 2018	-		4.310	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	SSC PAC, NAWC : San Diego, Pax River	0.000	0.677	Dec 2016	1.735	Dec 2017	2.750	Dec 2018	-		2.750	Continuing	Continuing	Continuing
Technical Data	WR	Various : Various	0.401	0.000		0.000		0.000		-		0.000	0.000	0.401	-
Support	Various	Various : Various	54.993	0.000		0.000		0.000		-		0.000	0.000	54.993	-
		Subtotal	55.394	1.377		5.440		9.760		-		9.760	Continuing	Continuing	N/A

Remarks

FY19 increase in funding requirements is essential to support a full year of software updates, Non-recurring Engineering (NRE), and Integrated Logistics Support (ILS) services for integration of Military Code (M-Code) capable Global Positioning System (GPS) receivers for surface ship platforms and air platforms in support of GPS Modernization.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air NAVWAR Test & Evaluation	WR	NAWC : Pax River	0.404	0.391	Nov 2016	2.250	Nov 2017	2.100	Nov 2018	-		2.100	Continuing	Continuing	Continuing
Sea NAVWAR Test & Evaluation	WR	SSC PAC, NUWC : San Diego, Newport	0.555	0.662	Nov 2016	0.338	Nov 2017	1.350	Nov 2018	-		1.350	Continuing	Continuing	Continuing
GPNTS Test & Evaluation	WR	SSC PAC : San Diego	0.987	0.820	Nov 2016	3.187	Nov 2017	3.500	Nov 2018	-		3.500	Continuing	Continuing	Continuing
GPS Mod Test & Evaluation	WR	SSC PAC, NAWC : San Diego, Pax River	0.000	0.167	Nov 2016	1.000	Nov 2017	1.900	Nov 2018	-		1.900	Continuing	Continuing	Continuing
Test & Evaluation	Various	Various : Various	45.296	0.000		0.000		0.000		-		0.000	0.000	45.296	-
		Subtotal	47.242	2.040		6.775		8.850		-		8.850	Continuing	Continuing	N/A

Remarks

FY19 increase in funding requirements is necessary to support testing of M-Code capable GPS receivers for integration on surface ship platforms and air platforms, as well as to prepare and conduct Initial Operational Test and Evaluation (IOT&E) for Global Positioning System (GPS) - Based Positioning, Navigation and Timing (PNT) Services (GPNTS).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	BAH : San Diego, Pax River, China Lake	7.494	2.395	Nov 2016	8.552	Nov 2017	6.777	Nov 2018	-		6.777	Continuing	Continuing	Continuing
Management Services	Various	Various : Various	10.334	0.000		0.000		0.000		-		0.000	0.000	10.334	-
		Subtotal	17.828	2.395		8.552		6.777		-		6.777	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	281.975	23.668		80.044		80.675		-		80.675	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

Air Navigation Program Schedule

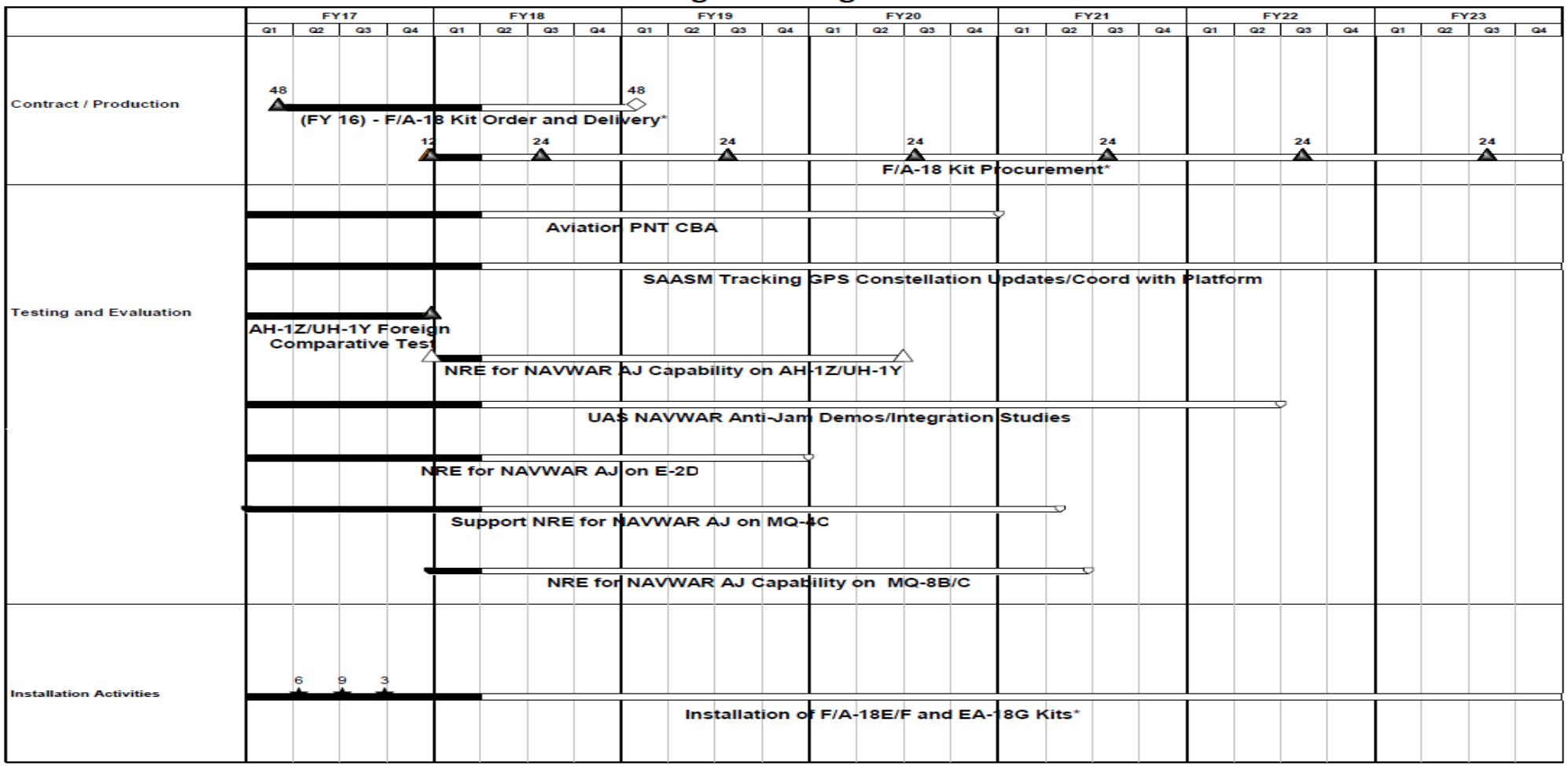


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

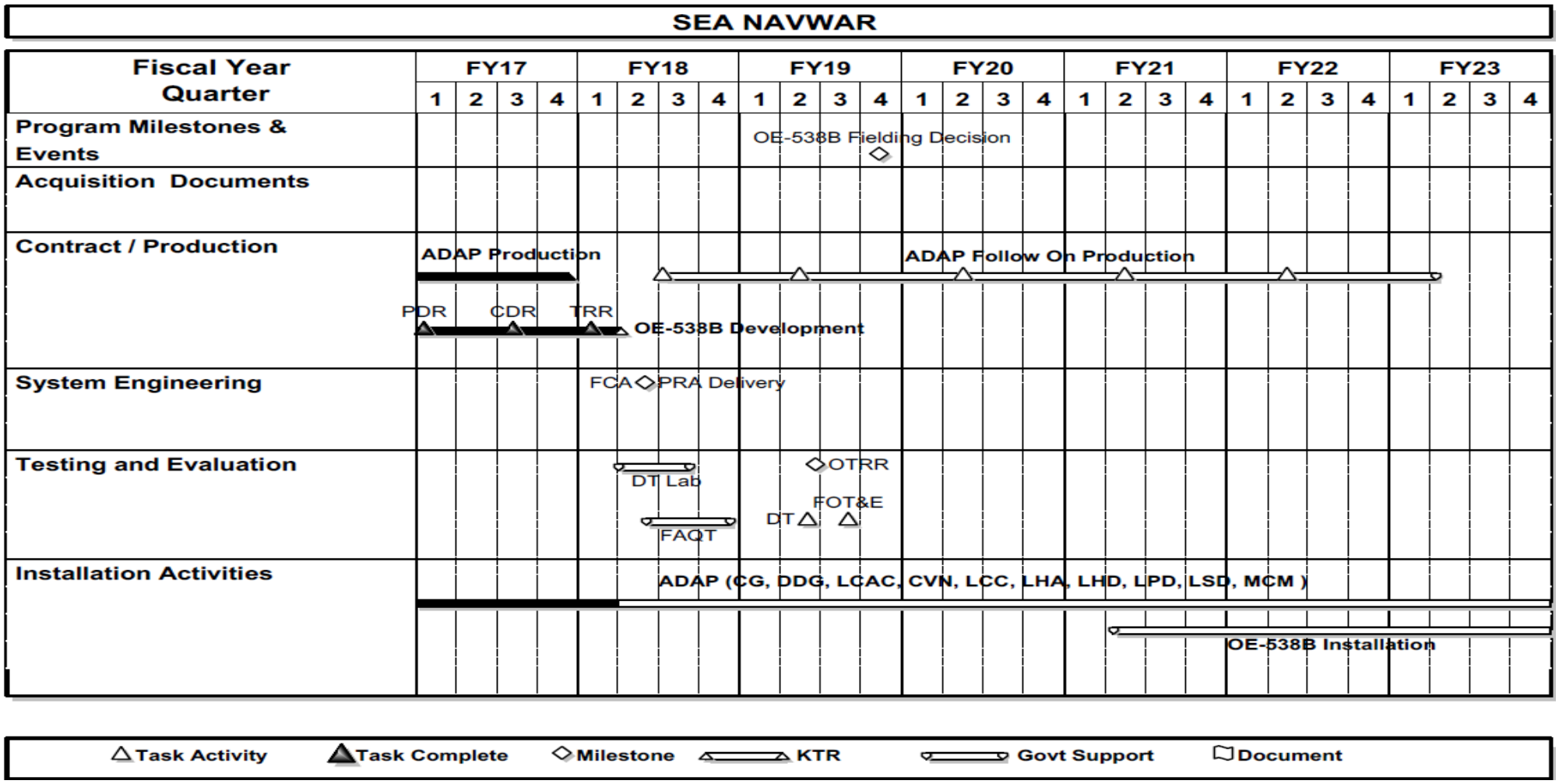


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

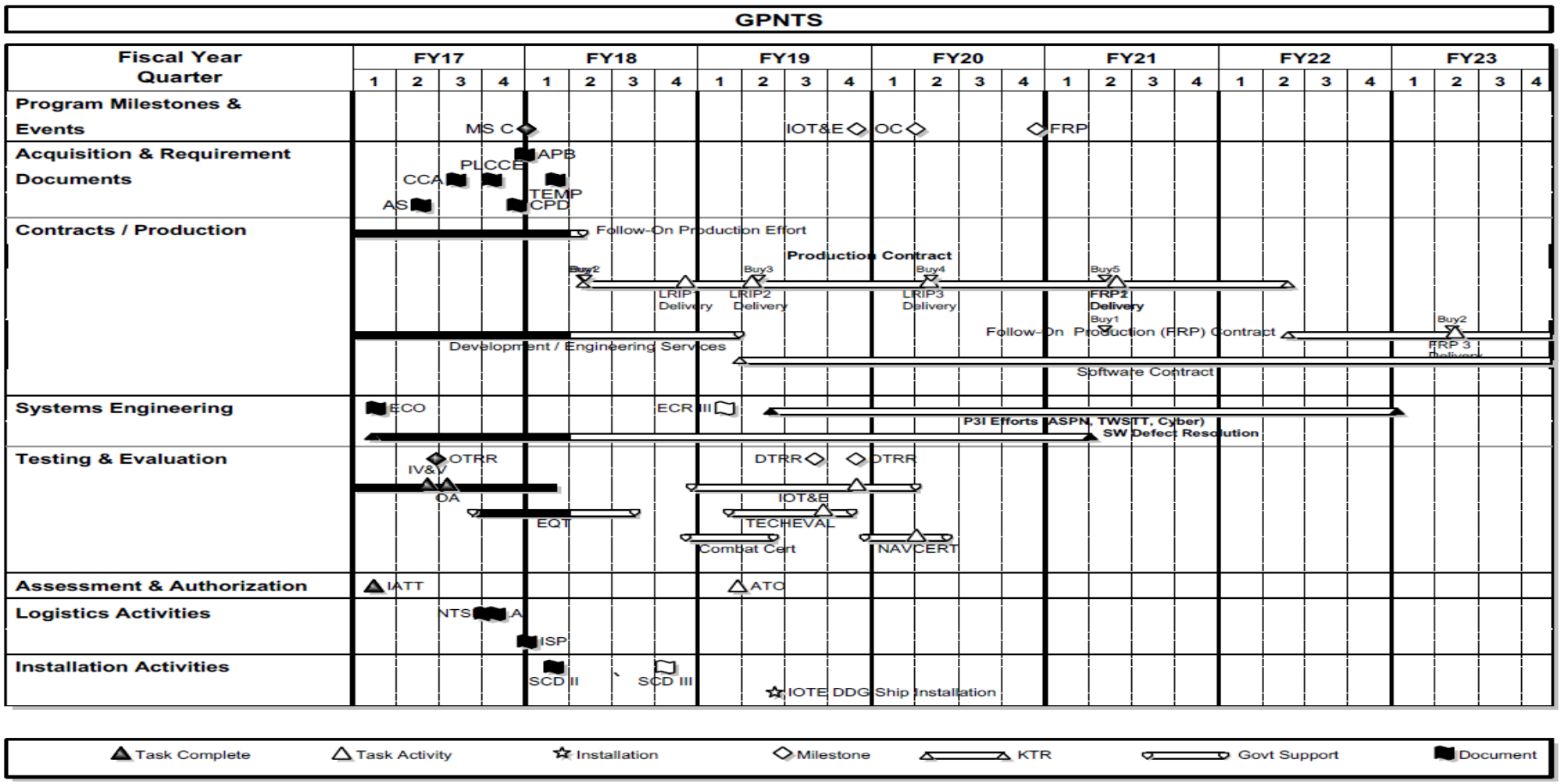


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

GPS Modernization

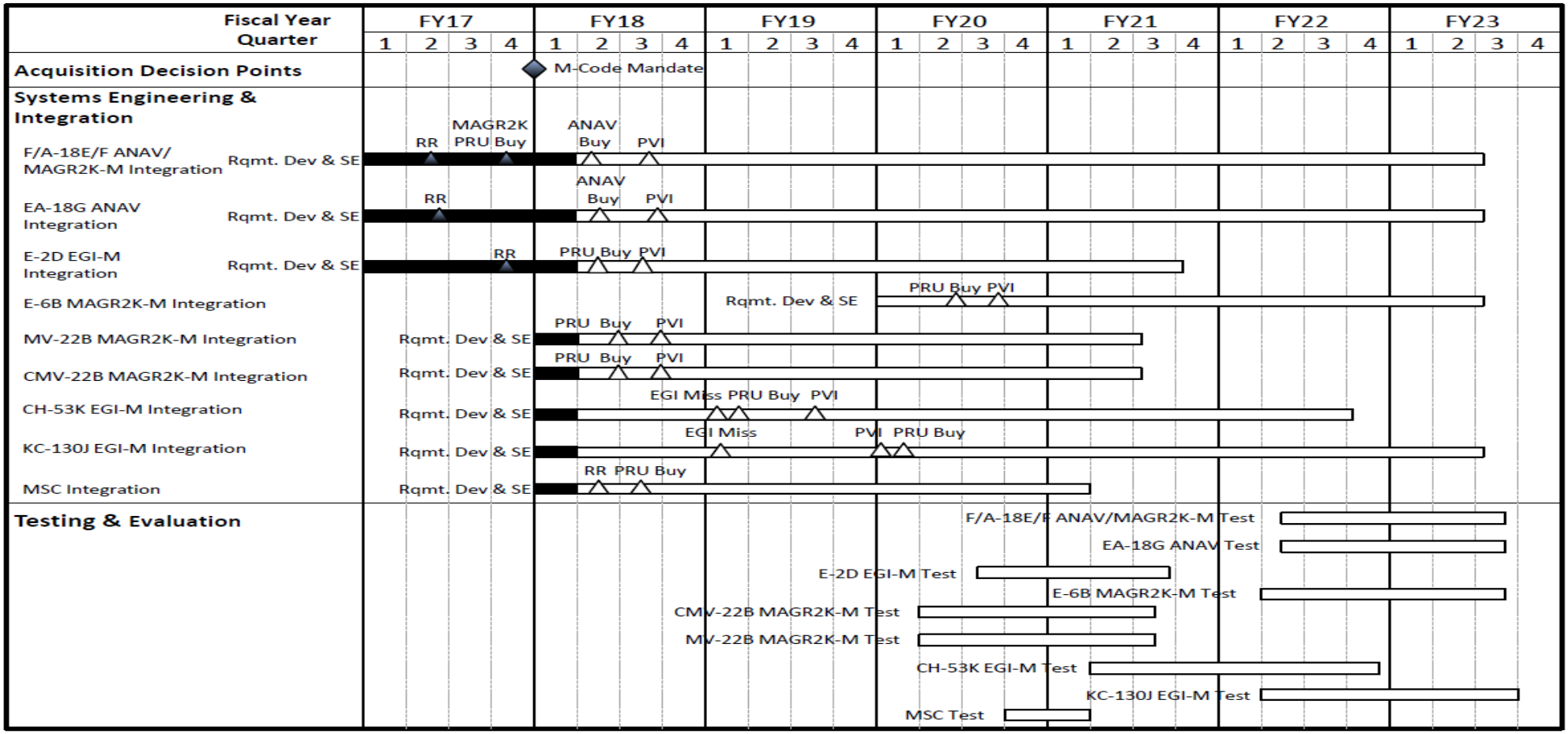


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0921				
Air NAVWAR: Air Navigation F/A-18 Kit Procurement 2016 Funds	1	2017	1	2017
Air NAVWAR: Air Navigation F/A-18 Kit Procurement 2017	4	2017	4	2017
Air NAVWAR: Air Navigation F/A-18 Kit Procurement 2018	3	2018	3	2018
Air NAVWAR: Air Navigation F/A-18 Kit Procurement 2019	3	2019	3	2019
Air NAVWAR: Air Navigation F/A-18 Kit Procurement 2020	3	2020	3	2020
Air NAVWAR: Air Navigation F/A-18 Kit Procurement 2021	3	2021	3	2021
Air NAVWAR: Air Navigation F/A-18 Kit Procurement 2022	3	2022	3	2022
Air NAVWAR: Air Navigation F/A-18 Kit Procurement 2023	3	2023	3	2023
Air NAVWAR: Air Navigation Aviation PNT CBA	1	2017	4	2020
Air NAVWAR: Air Navigation SAASM Tracking GPS Constellation Updates	1	2017	4	2023
Air NAVWAR: Air Navigation AH-1Z/UH-1Y Foreign Comparative Test	4	2017	4	2017
Air NAVWAR: Air Navigation NRE Integration for NAVWAR AJ on AH-1 Z/UH-1Y	1	2018	2	2020
Air NAVWAR: Air Navigation UAS NAVWAR Anti-Jam Demos/Integration Studies	1	2017	3	2022
Air NAVWAR: Air Navigation E-2D Ant-Jam Platform Coordination	1	2017	4	2019
Air NAVWAR: Air Navigation Support NRE for NAVWAR AJ on MQ-4C	1	2017	2	2021
Air NAVWAR: Air Navigation Integration for NAVWAR AJ Capability on MQ-8B/8C	1	2018	2	2021
Air NAVWAR: Air Navigation Installation of F/A-18 & EA-18 Kits	1	2017	4	2023
Sea NAVWAR: Sea Navigation OE-538B Fielding Decision	4	2019	4	2019
Sea NAVWAR: Sea Navigation ADAP Follow On Production FY18	3	2018	3	2018
Sea NAVWAR: Sea Navigation ADAP Follow On Production FY19	2	2019	2	2019
Sea NAVWAR: Sea Navigation ADAP Follow On Production FY20	2	2020	2	2020
Sea NAVWAR: Sea Navigation ADAP Follow On Production FY21	2	2021	2	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Sea NAVWAR: Sea Navigation ADAP Follow On Production FY22	2	2022	2	2022
Sea NAVWAR: Sea Navigation OE-538B Development	1	2017	2	2018
Sea NAVWAR: Sea Navigation Preliminary Design Review (PDR)CDR	1	2017	1	2017
Sea NAVWAR: Sea Navigation Critical Design Review (CDR)	3	2017	3	2017
Sea NAVWAR: Sea Navigation Test Readiness Review (TRR)	1	2018	1	2018
Sea NAVWAR: Sea Navigation Functional Configuarion Audit (FCA)	2	2018	2	2018
Sea NAVWAR: Sea Navigation Production Representative Article (PRA) Delivery	2	2018	2	2018
Sea NAVWAR: Sea Navigation Development Test (DT) LAB	2	2018	3	2018
Sea NAVWAR: Sea Navigation Operational Test Readiness Review (OTRR)	2	2019	2	2019
Sea NAVWAR: Sea Navigation First Article Qualification Testing (FAQT)	2	2018	4	2018
Sea NAVWAR: Sea Navigation Development Test (DT)	2	2019	2	2019
Sea NAVWAR: Sea Navigation Full Operational Test & Evaluation (FOT&E)	3	2019	3	2019
Sea NAVWAR: Sea Navigation ADAP Installations	1	2017	4	2023
Sea NAVWAR: Sea Navigation OE-538B Installations	2	2021	4	2023
GPS-based PNT Service (GPNTS): GPNTS Milestone C	4	2017	4	2017
GPS-based PNT Service (GPNTS): GPNTS Initial Operational Test & Evaluation (IOT&E)	4	2019	4	2019
GPS-based PNT Service (GPNTS): GPNTS Initial Operational Capability (IOC)	2	2020	2	2020
GPS-based PNT Service (GPNTS): GPNTS Full Rate Production (FRP)	4	2020	4	2020
GPS-based PNT Service (GPNTS): GPNTS Acquistion Program Baseline (APB)	1	2018	1	2018
GPS-based PNT Service (GPNTS): GPNTS PLCCE	4	2017	4	2017
GPS-based PNT Service (GPNTS): GPNTS Test and Evaluation Master Plan (TEMP)	1	2018	1	2018
GPS-based PNT Service (GPNTS): GPNTS Clinger Cohen Act (CCA)	3	2017	3	2017
GPS-based PNT Service (GPNTS): GPNTS Capability Production Document (CPD)	4	2017	4	2017
GPS-based PNT Service (GPNTS): GPNTS Acquisition Strategy (AS)	2	2017	2	2017
GPS-based PNT Service (GPNTS): GPNTS Follow-On Production Effort	1	2017	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GPS-based PNT Service (GPNTS): GPNTS Development/ Engineering Services	1	2017	1	2019
GPS-based PNT Service (GPNTS): GPNTS Production Contract	2	2018	2	2022
GPS-based PNT Service (GPNTS): GPNTS Buy 1	2	2018	2	2018
GPS-based PNT Service (GPNTS): GPNTS Buy 2	2	2018	2	2018
GPS-based PNT Service (GPNTS): GPNTS Buy 3	2	2019	2	2019
GPS-based PNT Service (GPNTS): GPNTS Buy 4	2	2020	2	2020
GPS-based PNT Service (GPNTS): GPNTS Buy 5	2	2021	2	2021
GPS-based PNT Service (GPNTS): GPNTS Follow On Production Contract	2	2022	4	2023
GPS-based PNT Service (GPNTS): GPNTS Software Contract	1	2019	4	2023
GPS-based PNT Service (GPNTS): GPNTS Engineering Change Order (ECO)	1	2017	1	2017
GPS-based PNT Service (GPNTS): GPNTS Engineering Change Request (ECR) Phase III	1	2019	1	2019
GPS-based PNT Service (GPNTS): GPNTS P3I Efforts	2	2019	1	2023
GPS-based PNT Service (GPNTS): GPNTS SW Defect Resolution	1	2017	1	2021
GPS-based PNT Service (GPNTS): GPNTS Operational Test Readiness Review (OTRR) 1	2	2017	2	2017
GPS-based PNT Service (GPNTS): GPNTS Development Test Readiness Review (DTRR)	3	2019	3	2019
GPS-based PNT Service (GPNTS): GPNTS Operational Test Readiness Review (OTRR) 2	4	2019	4	2019
GPS-based PNT Service (GPNTS): GPNTS Government Testing	1	2017	1	2018
GPS-based PNT Service (GPNTS): GPNTS Govt Testing: Independent Verification and Validation (IV&V)	2	2017	2	2017
GPS-based PNT Service (GPNTS): GPNTS Govt Testing: Operational Assessment (OA)	3	2017	3	2017
GPS-based PNT Service (GPNTS): GPNTS Initial Operational Test and Evaluation (IOT&E)	4	2018	1	2020
GPS-based PNT Service (GPNTS): GPNTS Environmental Quality Testing (EQT)	3	2017	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GPS-based PNT Service (GPNTS): GPNTS Technical Evaluation	1	2019	4	2019
GPS-based PNT Service (GPNTS): GPNTS NAVCERT	4	2019	2	2020
GPS-based PNT Service (GPNTS): GPNTS Combat Certification	4	2018	2	2019
GPS-based PNT Service (GPNTS): GPNTS Interim Authority to Test (IATT)	1	2017	1	2017
GPS-based PNT Service (GPNTS): GPNTS Authority to Operate (ATO)	1	2019	1	2019
GPS-based PNT Service (GPNTS): GPNTS Naval Training Support Plan (NTSP)	3	2017	3	2017
GPS-based PNT Service (GPNTS): GPNTS Initial Logistics Assessment (ILA)	4	2017	4	2017
GPS-based PNT Service (GPNTS): GPNTS Initial Security Plan (ISP)	1	2018	1	2018
GPS-based PNT Service (GPNTS): GPNTS Ship Change Document (SCD) II	1	2018	1	2018
GPS-based PNT Service (GPNTS): GPNTS SCD III	4	2018	4	2018
GPS-based PNT Service (GPNTS): GPNTS DDG Installation for IOT&E	2	2019	2	2019
GPS Modernization: GPS Modernization M-Code Mandate	1	2018	1	2018
GPS Modernization: GPS Modernization F-18E/F ANAV/MAGR2K-M Rqmts. Dev. & System Eng.	1	2017	3	2023
GPS Modernization: GPS Modernization F-18E/F ANAV/MAGR2K-M Risk Reduction Task Order	2	2017	2	2017
GPS Modernization: GPS Modernization F-18E/F MAGR2K-M PRU Buy	4	2017	4	2017
GPS Modernization: GPS Modernization F-18E/F ANAV PRU Buy 1	2	2018	2	2018
GPS Modernization: GPS Modernization F-18E/F ANAV/MAGR2K-M Prime Vendor Integration	3	2018	3	2018
GPS Modernization: GPS Modernization EA-18G ANAV Rqmts. Dev. & System Eng.	1	2017	3	2023
GPS Modernization: GPS Modernization EA-18G ANAV Risk Reduction Task Order	2	2017	2	2017
GPS Modernization: GPS Modernization EA-18G ANAV PRU Buy	2	2018	2	2018
GPS Modernization: GPS Modernization EA-18G ANAV Prime Vendor Integration (PVI)	3	2018	3	2018
GPS Modernization: GPS Modernization E-2D EGI-M Rqmts. Dev. & System Eng.	1	2017	4	2021
GPS Modernization: GPS Modernization E-2D EGI-M Risk Reduction Task Order	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GPS Modernization: GPS Modernization E-2D PRU Buy	2	2018	2	2018
GPS Modernization: GPS Modernization E-2D Prime Vendor Integration	3	2018	3	2018
GPS Modernization: GPS Modernization E-6B MAGR2K-M Rqmts. Dev. & System Eng.	1	2020	3	2023
GPS Modernization: GPS Modernization E-6B MAGR2K-M PRU Buy	2	2020	2	2020
GPS Modernization: GPS Modernization E-6B MAGR2K-M Prime Vendor Integration	3	2020	3	2020
GPS Modernization: GPS Modernization MV-22B MAGR2K-M Rqmts. Dev. & System Eng.	1	2018	3	2021
GPS Modernization: GPS Modernization MV-22B MAGR2K-M PRU Buy	2	2018	2	2018
GPS Modernization: GPS Modernization MV-22B MAGR2K-M Prime Vendor Integration	3	2018	3	2018
GPS Modernization: GPS Modernization CMV-22B MAGR2K-M Rqmts. Dev. & System Eng.	1	2018	3	2021
GPS Modernization: GPS Modernization CMV-22B MAGR2K-M PRU Buy	2	2018	2	2018
GPS Modernization: GPS Modernization CMV-22B MAGR2K-M Prime Vendor Integration	3	2018	3	2018
GPS Modernization: GPS Modernization CH-53K EGI-M Rqmts. Dev. & System Eng.	1	2018	4	2022
GPS Modernization: GPS Modernization CH-53K EGI-M Customization	1	2019	1	2019
GPS Modernization: GPS Modernization CH-53K EGI-M PRU Buy	1	2019	1	2019
GPS Modernization: GPS Modernization CH-53K EGI-M Prime Vendor Integration	3	2019	3	2019
GPS Modernization: GPS Modernization KC-130J EGI-M Rqmts. Dev. & System Eng.	1	2018	3	2023
GPS Modernization: GPS Modernization KC-130J EGI-M Customization	1	2019	1	2019
GPS Modernization: GPS Modernization KC-130J EGI-M PRU Buy	1	2020	1	2020
GPS Modernization: GPS Modernization KC-130J EGI-M Prime Vendor Integration	1	2020	1	2020
GPS Modernization: GPS Modernization MSC Rqmts. Dev. & System Eng.	1	2018	1	2021
GPS Modernization: GPS Modernization MSC Risk Reduction Task Order	2	2018	2	2018
GPS Modernization: GPS Modernization MSC PRU Buy	3	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 0921 / *NAVSTAR GPS Equipment*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GPS Modernization: GPS Modernization F-18E/F MAGR2K-M/EGI-M Pre-Test & Test	2	2022	3	2023
GPS Modernization: GPS Modernization EA-18G MAGR2K-M/EGI-M Pre-Test & Test	2	2022	3	2023
GPS Modernization: GPS Modernization E-2D EGI-M Pre-Test & Test	3	2020	3	2021
GPS Modernization: GPS Modernization E-6B MAGR2K-M Pre-Test & Test	2	2022	3	2023
GPS Modernization: GPS Modernization MV-22B MAGR2K-M Pre-Test & Test	2	2020	3	2021
GPS Modernization: GPS Modernization CMV-22B MAGR2K-M Pre-Test & Test	2	2020	3	2021
GPS Modernization: GPS Modernization CH-53K EGI-M Pre-Test & Test	2	2021	4	2022
GPS Modernization: GPS Modernization KC 130J EGI-M Pre-Test & Test	2	2022	3	2023
GPS Modernization: GPS Modernization MSC Pre-Test & Test	4	2020	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 1253 / *Combat Ident System*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1253: *Combat Ident System*	182.396	3.517	2.548	1.983	-	1.983	1.887	1.929	1.965	2.005	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MARK (MK) XIIA Mode 5 provides improved secure cooperative combat identification via Identification Friend or Foe (IFF). Mode 5 is developed in cooperation with North Atlantic Treaty Organization, with the DoD implementation governed by AIMS 03-1000A, AIMS 03-1000B and USN requirements defined in ORD # 577-06-01. IFF product improvements are designed to be installed through upgrade and deficiency correction studies, which in turn, become engineering changes to IFF interrogators and transponders and their associated cryptographic material.

The Navy MK XIIA Mode 5 program was approved for entry in Systems Development and Demonstration phase in August 2003 and into the Production and Deployment Phase and Low Rate Initial Production in July 2006, and Full Rate Production July 2012. The Navy Mode 5 program achieved Initial Operational Capability (IOC) in 2012 in accordance with the ORD. Mode 5 capable equipment was fielded in USN/USMC platforms in accordance with Joint Requirements Oversight Council Memorandums (047-07, 122-08 and 108-13) in support of Joint Mode 5 IOC in 2014 and is expected to meet Joint Full Operational Capability in FY2020.

RDT&E articles include Mode 5 cryptographic modules and associated hardware and software changes for IFF interrogators and transponders, including, but not limited to: AN/APX-118/123, AN/APX-119, and AN/APX-111 equipment. RDT&E units are required for government and contractor labs to support aircraft and ship integrations, test sites, test aircraft, and unmanned aircraft systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Mode 5 prototype hardware, cryptographic module	1.905	1.661	0.164	0.000	0.164
Articles:	-	-	-	-	-
Description: Develop kits for installation into existing fleet assets including AN/APX-118/123 Common Digital Transponder, and AN/APX-111 Combined Interrogator Transponder or other interrogator/transponder equipment to include small form factors. Repair and correct deficiencies identified during integration and test. Procure IFF interrogators and transponders, including, but not limited to: AN/APX-123, AN/APX-119, AN/APX-111, cryptographic modules and Mode 5 modification kits to support platform integration and testing. Perform platform integration efforts of Mode 5 equipment for various Type/Model/Series aircraft.					
FY 2018 Plans: Complete laboratory verification testing of the functionality of the Mode 5 capability in the CH-53K aircraft prior to FY2019 T&E efforts.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 1253 / *Combat Ident System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Begin T&E efforts testing the functionality of the Mode 5 capability in the CH-53K aircraft. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.497M from FY 2018 to FY 2019 is due to the ramp down of the Mode 5 integration into the CH-53K platform.					
Title: Mode 5 Systems Engineering and Integrated Logistics Support (ILS) ***Articles:*** ***Description:*** Performed systems engineering and analysis in support of Mode 5 hardware/software development and engineering change proposals on Identification Friend or Foe (IFF) interrogators and transponders, including but not limited to: AN/APX-123 Common Digital Transponder, AN/APX-119 Transponder, AN/APX-111 Combined Interrogator Transponder, Cryptographic Modules, Mode 5 Engineering Test Equipment, and Mode 5 support equipment. ***FY 2018 Plans:*** Finalize ECP for fleet installation of Mode 5 capability in CH-53K aircraft to support fleet fielding in late FY19. ***FY 2019 Base Plans:*** Development of small form factor IFF for unmanned aircraft systems. Support developmental test of Mode 5 capability in CH-53K aircraft. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.461M from FY 2018 to FY 2019 is due to the developmental testing requirements for the Mode 5 integration into the CH-53K platform.	0.412 -	0.338 -	0.799 -	0.000 -	0.799 -
Title: Mode 5 Upgrade Developmental Test & Operational Test ***Articles:*** ***Description:*** Perform Mode 5 integrated and operational test phases for AN/APX-123 Common Transponder, AN/APX-119 Transponder, and AN/APX-111 Combined Interrogator Transponder.	1.200 -	0.549 -	1.020 -	0.000 -	1.020 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 1253 / *Combat Ident System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Perform initial ground testing of Mode 5 in the CH-53K aircraft in support of FY19 flight testing and certification efforts. ***FY 2019 Base Plans:*** Perform CH-53K flight testing and certification efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $.471M from FY 2018 to FY 2019 is due to the support required for CH-53K flight testing (and certification) with Mode 5.					
Accomplishments/Planned Programs Subtotals	3.517	2.548	1.983	0.000	1.983

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/2851: *ID Systems*	22.177	21.239	26.163	-	26.163	26.139	25.463	49.655	57.497	348.665	875.227
• APN/0582: *ID Sys*	42.262	49.524	40.696	-	40.696	41.494	35.895	13.554	9.848	0.042	503.970

Remarks

D. Acquisition Strategy

The Acquisition Strategy is to develop Mode 5 Engineering Change Proposals to modernize Mark XII Identification Friend or Foe (IFF) equipment or insert Mode 5 into existing platforms by JROC memorandums (047-07, 122-08 and 108-13). After integration into all Navy Combat Weapons systems platforms, the Navy will transition Cooperative Identification Capability to Mode 5.

E. Performance Metrics

Continue Full Rate Production and assist in achieving Joint Full Operational Capability in FY2020. Perform studies and analysis for future road mapping of IFF capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 1253 / *Combat Ident System*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCAD : PAX River, MD	15.377	0.248	Nov 2016	0.204	Nov 2017	0.092	Nov 2018	-		0.092	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : St Inigoes, MD	14.751	0.051	Nov 2016	0.051	Nov 2017	0.655	Nov 2018	-		0.655	Continuing	Continuing	Continuing
Primary Hardware Development	WR	NAWCWD : China Lake, CA	17.218	0.000		0.000		0.000		-		0.000	0.000	17.218	-
Primary Hardware Development	Various	Sikorsky : Stratford, CT	0.890	1.905	Jan 2017	1.661	Jan 2018	0.164	Jan 2019	-		0.164	0.164	4.784	4.784
Primary Hardware Development	Various	Boeing : St Louis, MO	30.426	0.000		0.000		0.000		-		0.000	0.000	30.426	30.426
Prior Year Prod Dev Services costs no longer funded in FYDP	Various	Various : Various	43.213	0.000		0.000		0.000		-		0.000	0.000	43.213	43.213
		Subtotal	121.875	2.204		1.916		0.911		-		0.911	Continuing	Continuing	N/A

Remarks

The Product Development increase from FY18 to FY19 is due to systems engineering requirements for the development of small form factor IFF for unmanned aircraft systems.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ILS	Various	Various : Various	4.927	0.113	Nov 2016	0.083	Nov 2017	0.052	Nov 2018	-		0.052	Continuing	Continuing	Continuing
Prior Year Support Services costs no longer funded in FYDP	Various	Various : Various	2.761	0.000		0.000		0.000		-		0.000	0.000	2.761	2.761
		Subtotal	7.688	0.113		0.083		0.052		-		0.052	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 1253 / *Combat Ident System*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental T & E	WR	NAWCAD : PAX River, MD	28.067	1.200	Nov 2016	0.549	Nov 2017	1.020	Nov 2018	-		1.020	7.705	38.541	-
Develop/Operational T & E	WR	COMOPTEVFOR : Norfolk, VA	0.291	0.000		0.000		0.000		-		0.000	0.000	0.291	-
Operational T & E	WR	NAWCAD : PAX River, MD	16.623	0.000		0.000		0.000		-		0.000	0.000	16.623	-
Test Assets	Various	Various : Various	3.456	0.000		0.000		0.000		-		0.000	0.000	3.456	3.456
		Subtotal	48.437	1.200		0.549		1.020		-		1.020	7.705	58.911	N/A

Remarks

The development T&E increase from FY18 to FY19 is due to testing of the small form factor development and flight test efforts associated with CH-53K testing.

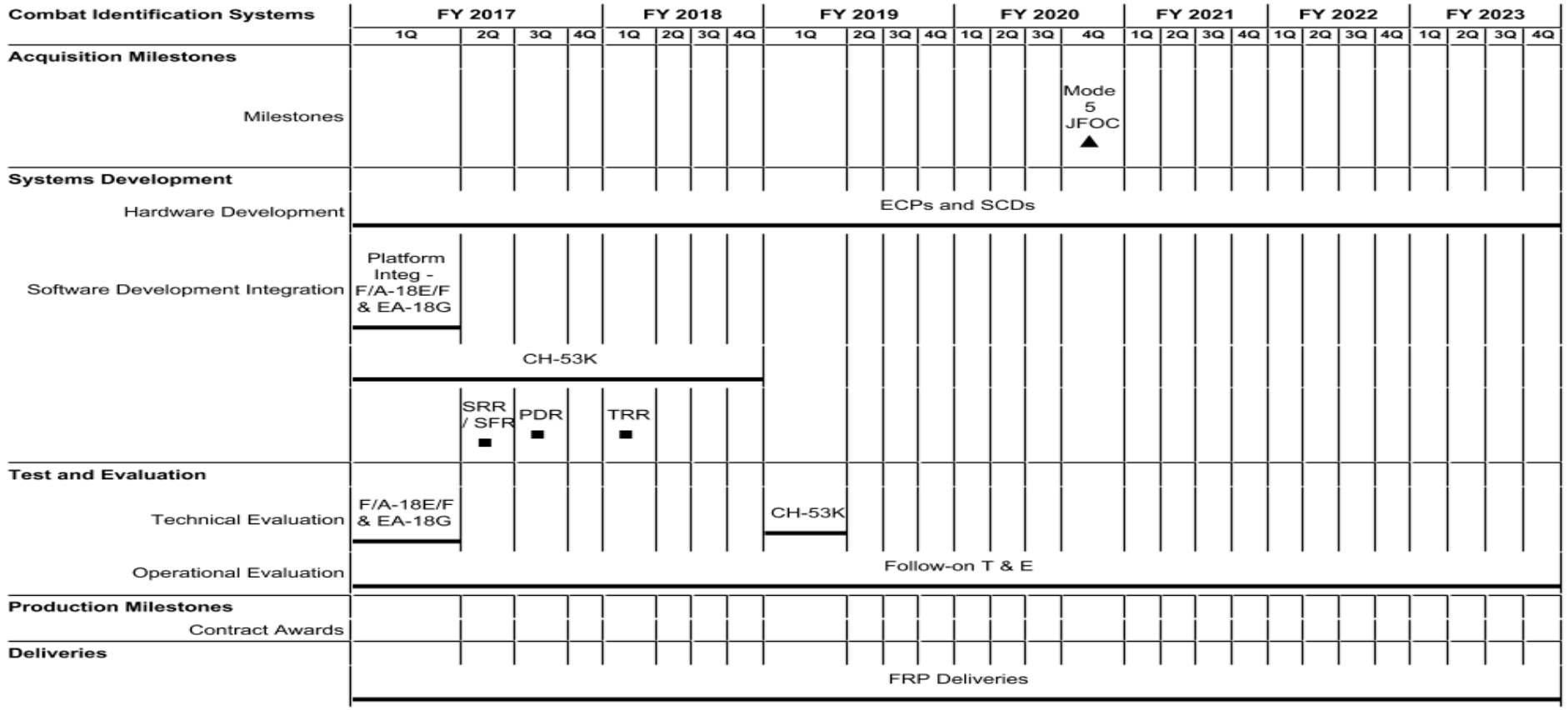
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Mgmt Services costs no longer funded in FYDP	Various	Various : Various	4.396	0.000		0.000		0.000		-		0.000	0.000	4.396	4.396
		Subtotal	4.396	0.000		0.000		0.000		-		0.000	0.000	4.396	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	182.396	3.517		2.548		1.983		-		1.983	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 1253 / *Combat Ident System*



2019PB - 0604777N - 1253

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 1253 / *Combat Ident System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Combat Identification Systems				
Acquisition Milestones: Milestones: Mode 5 JFOC	4	2020	4	2020
Systems Development: Hardware Development: Prepare & Evaluate ECPs/SCDs	1	2017	4	2023
Systems Development: Software Development Integration: Platform Integration	1	2017	1	2017
Systems Development: Software Development Integration: CH-53K	1	2017	4	2018
Systems Development: Software Development Integration: System Requirements Review / System Functional Review	2	2017	2	2017
Systems Development: Software Development Integration: Preliminary Design Review	3	2017	3	2017
Systems Development: Software Development Integration: Test Readiness Review	1	2018	1	2018
Test and Evaluation: Technical Evaluation: F/A-18E/F & EA-18G	1	2017	1	2017
Test and Evaluation: Technical Evaluation: CH-53K	1	2019	1	2019
Test and Evaluation: Technical Evaluation: F/A-18E/F Verification	1	2017	1	2017
Test and Evaluation: Operational Evaluation: Follow-on Test and Evaluation	1	2017	4	2023
Deliveries: FRP Deliveries	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	5.803	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.803
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

$6M congressional increase received for development of an M-Code capable GPS receiver for the Advanced Anti-Radiation Guided Missile (AARGM). GPS receivers will utilize the military code (M-Code) GPS Signal in Space, incorporate enhanced cryptology, deliver greater position and time accuracy, and provide improved protection against signal spoofing as compare to legacy Selective Availability Anti-Spoofing Module (SAASM) receivers. After development and test is complete, integration of GPS receiver into the AARGM will be completed with AARGM program of record funding. Efforts support Navy's compliance with Public Law 111-383, which requires that all GPS user equipment be capable of receiving the new GPS M-Code signal after FY 2017.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Improved GPS	5.803	0.000
FY 2017 Accomplishments: FY17 funding will complete development and test of a NAVSTRIKE-M M-Code capable GPS receiver with AARGM specific requirements included over an 18 month period of performance starting from receipt of funding. Specifically this effort will: - Develop and add AARGM specific software to NAVSTRIKE-M receiver - Procure two (2) prototype NAVSTRIKE-M receiver cards with AARGM software update for testing and performance characterization with the AARGM missile. - Conduct developmental Testing (DT) of NAVSTRIKE-M receiver cards with AARGM software. - Update two (2) prototype cards with final software after correction of deficiencies found during testing. - Procure and provide two (2) additional qualified, security certified and Military (M) code-capable NAVSTRIKE receiver cards with final software to AARGM program of record for integration into AARGM. - Provide overarching management, central coordination, government oversight and guidance, shared expertise, and engineering support to ensure AARGM performance and integration requirements are supported during NAVSTRIKE receiver development.		
FY 2018 Plans: N/A		
Congressional Adds Subtotals	5.803	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 9999 / *Congressional Adds*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

The performance goal is met if successful development test and evaluation is achieved.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604777N / *Navigation/Id System*	Project (Number/Name) 9999 / *Congressional Adds*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AARGM Product Development	C/CPFF	Rockwell : Cedar Rapids, IA	0.000	4.000	Aug 2017	0.000		0.000		-		0.000	0.000	4.000	-
AARGM Development Support	WR	SSC PAC : San Diego, CA	0.000	0.300	Jun 2017	0.000		0.000		-		0.000	0.000	0.300	-
		Subtotal	0.000	4.300		0.000		0.000		-		0.000	0.000	4.300	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT&E	C/FFP	Rockwell : Cedar Rapids, IA	0.000	0.803	Aug 2017	0.000		0.000		-		0.000	0.000	0.803	-
		Subtotal	0.000	0.803		0.000		0.000		-		0.000	0.000	0.803	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPAF	TBD : San Diego, Pax River, China Lake	0.000	0.700	Aug 2017	0.000		0.000		-		0.000	0.000	0.700	-
		Subtotal	0.000	0.700		0.000		0.000		-		0.000	0.000	0.700	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	5.803		0.000		0.000		-		0.000	0.000	5.803	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 9999 / *Congressional Adds*

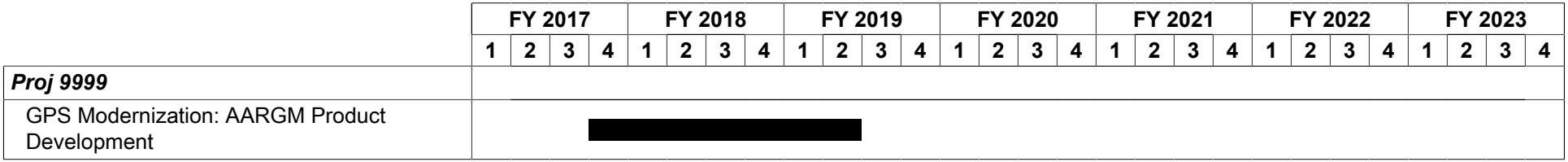


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604777N / *Navigation/Id System*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
GPS Modernization: AARGM Product Development	4	2017	2	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604800M *I (U)Joint Strike Fighter (JSF) - EMD*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	49,382.978	519.393	152.934	66.566	-	66.566	1.713	0.542	0.558	0.569	0.000	50,125.253
2262: *Joint Strike Fighter EMD STOVL*	49,044.533	495.958	141.534	66.566	-	66.566	1.713	0.542	0.558	0.569	0.000	49,751.973
3350: *F-35B Sustainment/ Capability Enhancements*	338.445	23.435	11.400	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	373.280
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 198												

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the USN, USAF, USMC and allies. The three variants are the F-35A conventional takeoff and landing; F-35B short takeoff and vertical landing; and the F-35C Aircraft Carrier suitable variant. The F-35A will be a stealthy multi-role aircraft, primary air-to-ground for the Air Force to replace the F-16 and A-10 and complement the F-22. The F-35B variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18 for the Marine Corps, replace the Sea Harrier and GR 7 for the United Kingdom, and replace the AV-8 currently employed by the Italian Navy. The F-35C will provide the Department of the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F.

The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark, Norway, and Foreign Military Sales customers are also participants in the JSF program. The program shown here reflects USN, USMC, USAF, and International Partner funding.

Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants.

The System Development and Demonstration (SDD) budget funds a total quantity of 20 RDT&E test articles to include 6 ground test articles and 14 flight test articles for USN, USMC, and USAF use.

FY07: 1 F-35A flight test article
FY08: 1 F-35B flight test article; 1 F-35B ground test article
FY09: 1 F-35B flight test article; 2 F-35A ground test articles
FY10: 6 flight test articles: 3 F-35A, 2 F-35B, 1 F-35C; 3 ground test articles: 1 F-35B, 2 F-35C
FY11: 4 flight test articles: 1 F-35A, 1 F-35B, 2 F-35C
FY13: 1 F-35C flight test article

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SDD because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604800M *I (U)Joint Strike Fighter (JSF) - EMD*

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	531.426	152.934	55.952	-	55.952
Current President's Budget	519.393	152.934	66.566	-	66.566
Total Adjustments	-12.033	0.000	10.614	-	10.614
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-12.033	0.000			
• Program Adjustments	0.000	0.000	11.000	-	11.000
• Rate/Misc Adjustments	0.000	0.000	-0.386	-	-0.386

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*				Project (Number/Name) 2262 / *Joint Strike Fighter EMD STOVL*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2262: *Joint Strike Fighter EMD STOVL*	49,044.533	495.958	141.534	66.566	-	66.566	1.713	0.542	0.558	0.569	0.000	49,751.973
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 198

Note

Total cost including United States Navy (USN), United States Marine Corps (USMC), International partner contributions and United States Air Force (USAF) funding are: FY17 $1,394.043M, FY18 $ 527.873M and FY19 $196.622M R-2 data reflects variant unique funding only.

R-2A(section B)/R-3 displays total combined program (i.e. not Service specific), including International partners.

F-35 EMD Includes:
USAF PE 0604800F BPAC 653831
USN PE 0604800N Project Unit 2261
USMC PE 0604800M Project Unit 2262

D&S Includes:
USAF PE 0604800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the USN, USAF, USMC and allies. The three variants are the F-35A Conventional Takeoff and Landing; F-35B Short Takeoff and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. The F-35A will be a stealthy multi-role aircraft, primary air-to-ground for the Air Force to replace the F-16 and A-10 and complement the F-22. The F-35B variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18 for the Marine Corps, replace the Sea Harrier and GR 7 for the United Kingdom, and replace the AV-8 currently employed by the Italian Navy. The F-35C will provide the Department of the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F.

The United Kingdom, other International Partner nations, and Foreign Military Sales customers are also participants in the Joint Strike Fighter program. The program shown here reflects United States Navy (USN), United States Marine Corps, United States Air Force (USAF), and International Partner funding.

The top-line Program Element reflects the unique variant for each Service. Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*

The System Development and Demonstration (SDD) budget funds a total quantity of 20 RDT&E test articles to include 6 ground test articles and 14 flight test articles for USN, USMC and USAF use.

FY07: 1 F-35A flight test article
FY08: 1 F-35B flight test article; 1 F-35B ground test article
FY09: 1 F-35B flight test article; 2 F-35A ground test articles
FY10: 6 flight test articles: 3 F-35A, 2 F-35B, 1 F-35C; 3 ground test articles: 1 F-35B, 2 F-35C
FY11: 4 flight test articles: 1 F-35A, 1 F-35B, 2 F-35C
FY13: 1 F-35C flight test article

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: System Development and Demonstration (SDD)	883.024	331.782	164.165	0.000	164.165
Articles:	-	-	-	-	-
Description: SDD execution of the Air System (Lockheed Martin) including International Commonality Efforts; includes airframe, vehicle and mission systems, autonomic logistics, systems engineering & test efforts.					
FY 2018 Plans: Continue SDD execution of Air System Lockheed Martin, including International Commonality Effort which includes, airframe, vehicle systems, mission systems, autonomic logistics, systems engineering, and integrated test efforts. Activity aligned to IMS in accordance with variant IOC.					
FY 2019 Base Plans: Continue SDD execution of Air System Lockheed Martin, including International Commonality Effort which includes, airframe, vehicle systems, mission systems, autonomic logistics, systems engineering, and integrated test efforts. Activity aligned to IMS in accordance with variant IOC.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: F135 Propulsion System	120.000	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: SDD execution of the F135 Propulsion System (Pratt & Whitney) including International Commonality Effort; includes testing, autonomic logistics, integration & performing technology maturation efforts. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: Systems Engineering (SE)	28.181	0.912	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: SDD SE including systems operations requirements analysis, program integration, requirements integration, and interoperability support. ***FY 2018 Plans:*** Complete SDD SE, including systems operations requirements analysis, program integration, requirements integration, and interoperability support. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: Test and Evaluation (T&E)	281.672	143.809	4.293	0.000	4.293
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Government DT&E/Operational Testing (OT) in support of first flight of test aircraft. Elements of DT&E include preparation for flight testing and weapons integration testing. ***FY 2018 Plans:*** Continue government DT&E/OT in support of test aircraft. Continue flight sciences testing of CTOL, STOVL, and CV variants to expand air vehicle envelope and support mission systems testing. Elements of DT&E include flight testing, weapons integration testing, and component capabilities testing. ***FY 2019 Base Plans:*** Continue government DT&E/OT in support of test aircraft. Continue flight sciences testing of CTOL, STOVL, and CV variants to expand air vehicle envelope and support mission systems testing. Elements of DT&E include flight testing, weapons integration testing, and component capabilities testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: Development Support	80.945	10.676	0.764	0.000	0.764
Articles:	-	-	-	-	-
Description: SDD Support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2018 Plans:*** Continue SDD support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2019 Base Plans:*** Continue SDD support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: Autonomic Logistics Information System (ALIS) ***Articles:*** ***Description:*** SDD execution of Autonomic Logistics Information System (ALIS) develops the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2018 Plans:*** Continue SDD execution of ALIS to develop the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2019 Base Plans:*** Continue SDD execution of ALIS to develop the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.	0.221 -	40.694 -	27.400 -	0.000 -	27.400 -
Accomplishments/Planned Programs Subtotals	1,394.043	527.873	196.622	0.000	196.622
Joint Strike Fighter 0604800F	386.941	255.745	69.519	-	69.519
Joint Strike Fighter 0604800N	489.144	103.144	60.537	-	60.537
International Partner	22.000	27.450	-	-	-
Navy Subtotals	495.958	141.534	66.566	0.000	66.566

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	Project (Number/Name) 2262 / *Joint Strike Fighter EMD STOVL*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E/0604800F: *F-35A Joint Strike Fighter*	388.660	255.745	69.655	-	69.655	7.796	5.598	0.000	0.000	0.000	22,247.823
• International: *International Partner (SDD)*	22.000	27.450	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5,013.463
• APAF/0207142F BP10: *F-35A USAF CTOL*	4,667.894	4,544.684	4,253.696	-	4,253.696	4,209.813	4,862.684	4,796.042	0.000	148,685.767	202,884.710
• RDT&E/0604800N/2261: *F-35C Joint Strike Fighter (JSF) - EMD*	489.144	103.144	60.537	-	60.537	1.499	0.328	0.323	0.345	0.000	49,699.853
• APN/0605B: *F-35B Joint Strike Fighter STOVL Spares*	123.252	105.671	92.198	-	92.198	160.150	140.989	143.809	0.000	Continuing	Continuing
• APN/0605C: *F-35C Joint Strike Fighter CV Spares*	26.076	84.591	44.971	-	44.971	52.858	303.608	309.680	0.000	Continuing	Continuing
• MILCON 0207142F: *USAF MILCON Operations*	305.700	181.250	175.150	-	175.150	154.400	0.000	0.000	0.000	0.000	1,602.550
• APAF/0207142F BP11: *USAF Modification Funding*	115.811	68.270	230.448	-	230.448	279.814	259.978	301.899	0.000	0.000	1,665.794
• FOD/0207142F: *USAF Follow-on Development (FoD)*	50.970	299.408	396.821	-	396.821	504.971	418.988	343.147	283.292	Continuing	Continuing
• 0207142F/USAF BP16: *USAF Joint Strike Fighter Initial Spares*	362.792	320.831	319.151	-	319.151	416.722	399.361	394.654	0.000	4,175.007	7,849.413
• USAF/OPAF 0207142F: *USAF OPAF*	2.333	3.326	3.310	-	3.310	2.993	2.463	2.507	0.000	Continuing	Continuing
• APN/0592: *F-35B STOVL Series*	24.350	34.963	36.618	-	36.618	38.582	47.609	50.163	53.742	Continuing	Continuing
• APN/0593: *F-35C CV Series*	21.733	31.689	21.236	-	21.236	13.136	12.435	12.683	12.938	Continuing	Continuing
• RDT&E/0604800N/3352: *F-35C Sustainment/ Capability Enhancements*	23.518	5.787	4.957	-	4.957	0.000	0.000	0.000	0.000	0.000	372.707
• USAF SDD BP 653832: *JSF Deployability and Suitability Enhancements*	46.962	37.202	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	241.159
• PAF/0207142F BP10: *F-35A JSF CTOL Advance Procurement*	404.500	780.300	405.200	-	405.200	1,003.600	965.300	414.700	0.000	20,154.954	26,885.296

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• DCA/0207142F 676011: *Dual Capable Aircraft (DCA)*	25.743	35.122	78.016	-	78.016	92.026	95.040	37.599	11.725	Continuing	Continuing
• APN/0147: *F-35C Joint Strike Fighter CV*	1,360.880	663.232	1,341.369	-	1,341.369	1,938.799	2,793.290	2,963.544	2,973.130	26,243.243	54,674.071
• APN/0152C: *F-35B Joint Strike Fighter STOVL AP*	233.648	413.450	228.492	-	228.492	215.704	209.222	225.245	229.749	1,651.860	4,696.946
• APN/0152: *F-35B Joint Strike Fighter STOVL*	2,504.927	2,631.787	2,635.111	-	2,635.111	2,700.264	2,658.313	2,666.245	2,851.920	20,419.570	47,203.890
• DoN MILCON: *DoN JSF MILCON*	230.900	64.660	121.990	-	121.990	119.800	0.000	0.000	0.000	642.400	1,406.074
• International 2: *Intl Production/ Reprogramming Lab*	185.641	124.114	151.776	-	151.776	150.588	149.848	87.119	0.000	Continuing	Continuing
• OPN/4268: *Logistics Information System (ALIS)*	29.528	63.277	39.374	-	39.374	51.457	54.934	70.046	71.314	Continuing	Continuing
• MC/0207597F: *USAF MILCON Training*	20.000	70.350	11.000	-	11.000	0.000	0.000	0.000	0.000	0.000	166.750
• International 3: *International R&D FoM/D&S*	84.602	158.273	159.649	-	159.649	162.023	167.383	160.111	0.000	Continuing	Continuing
• OPN 902010 S8JC: *Aviation Support Equipment (ALIS)*	0.881	2.297	2.321	-	2.321	0.139	1.977	0.000	0.000	Continuing	Continuing
• USAF O&M: *USAF O&M*	425.978	516.569	731.134	-	731.134	909.930	985.790	1,089.394	0.000	Continuing	Continuing
• USAF MILCON 0502635F: *USAF MILCON Air National Guard*	15.100	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.100
• USN 2936: *F-35C Follow-on Development (CV)*	63.387	139.942	224.712	-	224.712	228.707	188.678	120.192	0.000	Continuing	Continuing
• International Unique: *Intl Unique (SDD/PSFD)*	32.374	15.566	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	481.617

Remarks

D. Acquisition Strategy

The SDD program consists of a cost-reimbursement contract awarded to Lockheed Martin Aeronautics Company to develop the F-35 Air System, consisting of three aircraft variants and its associated logistics support system, for the U.S. Services and international participants. Similarly, a cost-reimbursement contract was awarded to Pratt & Whitney to develop the F135 propulsion system. Ground and flight testing will be conducted during development to accomplish validation and verification, with

the extensive use of modeling and simulation to offset the risk of this large, complex, and concurrent lifecycle program. A comprehensive logistics support environment, including an integrated training system for aircrew, maintenance, and support personnel, is also being developed.

On 25 April 2011, the Department of Defense terminated the development of the General Electric Rolls-Royce Fighter Engine Team F136 propulsion system.

The F-35 Program has made international involvement a key element of the acquisition strategy. This includes international partnership in the development, production, and sustainment phases of the lifecycle. Additional international participation includes Foreign Military Sales arrangements.

In Fiscal Year 2007, separate cost-type contracts were awarded to Lockheed Martin Aeronautics Company and Pratt & Whitney to begin low rate initial production for F-35 air vehicles, propulsion systems, and sustainment for the fielded systems. Transition to fixed-price-type procurement contracts occurred with the fourth low rate lot. To provide logistics support for delivered aircraft, Performance-Based Logistics cost-type contracts will be awarded to Lockheed Martin Aeronautics Company and Pratt & Whitney.

At the completion of Low Rate Initial Production, a Defense Acquisition Board review, and Milestone Decision Authority approval, the F-35 Program will enter Full Rate Production. Fixed-price procurement contracts will be awarded for F-35 air vehicles and propulsion systems for the U.S. Services and international participants. Multiyear procurement authority for the F-35 Air System will be requested for Full Rate Production. Concurrently, a fixed-price-type Performance Based Logistics contracts for sustainment will be requested to support multi-Service and multi-national requirements.

E. Performance Metrics

The following are the key performance parameters from the F-35 Selected Acquisition Report:

Performance Metrics reflect Key Program Performance data.

Combat Radius
F-35A Meets/Exceeds Tripwire Requirement
F-35B Meets/Exceeds Tripwire Requirement
F-35C Meets/Exceeds Tripwire Requirement

CV Recovery Performance
Maximum Approach Speed at required carrier landing weight

Mission Reliability
F-35A Meets/Exceeds Tripwire Requirement
F-35B Meets/Exceeds Tripwire Requirement
F-35C Meets/Exceeds Tripwire Requirement

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*

Sortie Generation Rate
F-35A Meets Tripwire Requirement
F-35B Meets Tripwire Requirement
F-35C Meets Tripwire Requirement

Logistics Footprint
F-35A Less than or equal to 8 C-17 equivalents
F-35B Less than or equal to 8 C-17 equivalents
F-35C Less than or equal to 38,800 cu ft., 217 ST

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - SDD	C/CPIF	Lockheed Martin : Ft. Worth, TX	31,298.696	731.806	Dec 2016	274.720	Dec 2017	161.665	Dec 2018	-		161.665	16.771	32,483.658	32,483.658
Primary Hardware Development - Award Fee	C/CPIF	Lockheed Martin : Ft. Worth, TX	1,727.259	11.430	Dec 2016	35.000	Dec 2017	2.500	Dec 2018	-		2.500	0.000	1,776.189	1,776.189
Primary Hardware Development - ALIS	C/CPIF	Lockheed Martin : Ft. Worth, TX	462.317	0.221	Dec 2016	40.694	Dec 2017	27.400	Dec 2018	-		27.400	0.000	530.632	530.632
Primary Hardware Development - 0031	C/CPFF	Lockheed Martin : Ft. Worth, TX	0.337	0.506	Dec 2016	0.169	Dec 2017	0.000		-		0.000	0.000	1.012	1.012
Primary Hardware Development - 0020	C/CPFF	Lockheed Martin : Ft. Worth, TX	81.838	139.281	Dec 2016	21.893	Dec 2017	0.000		-		0.000	0.000	243.012	243.012
Primary Hardware Development - SDD	C/CPIF	Pratt and Whitney : Hartford, CT	7,296.328	105.448	Dec 2016	0.000		0.000		-		0.000	0.000	7,401.776	7,401.776
Primary Hardware Development - Award Fee	C/CPIF	Pratt and Whitney : Hartford, CT	677.646	14.552	Dec 2016	0.000		0.000		-		0.000	0.000	692.198	692.198
Systems Engineering	Various	Various : Various	435.371	23.577	Nov 2016	0.911	Dec 2017	0.000		-		0.000	0.000	459.859	459.859
Prior Year No Longer Funded in FYDP	Various	Various : Various	2,909.122	0.000		0.000		0.000		-		0.000	0.000	2,909.122	2,909.122
		Subtotal	44,888.914	1,026.821		373.387		191.565		-		191.565	16.771	46,497.458	N/A

Remarks

Contract type prior to 2013 was CPAF.
Cumulative Award Fee earned in prior years for Lockheed Martin is 97%.
Cumulative Award Fee earned in prior years for Pratt and Whitney is 98%.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support - AFFTC/Eglin	Various	Eglin AFB : Eglin, FL	138.926	1.834	Nov 2016	0.830	Nov 2017	0.000		-		0.000	0.000	141.590	-
Development Support - AFLCMC/AFRL	Various	AFLCMC/AFRL : Various	75.829	3.133	Nov 2016	0.000		0.000		-		0.000	0.000	78.962	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	Project (Number/Name) 2262 / *Joint Strike Fighter EMD STOVL*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engine Test and Evaluation Support - AEDC/Fuel	Various	Various : Various	199.947	3.771	Nov 2016	0.000		0.000		-		0.000	0.000	203.718	-
Development Support - Miscellaneous	Various	Various : Various	123.516	12.356	Nov 2016	2.927	Nov 2017	0.764	Nov 2018	-		0.764	0.000	139.563	-
Software Development Support	Various	NAWC WD : China Lake, CA	163.175	4.312	Nov 2016	0.000		0.000		-		0.000	0.000	167.487	-
Development Support	Various	NAWC AD : Patuxent, MD	505.484	41.726	Nov 2016	6.913	Nov 2017	0.000		-		0.000	0.000	554.123	-
Prior Year No Longer Funded in FYDP	Various	Various : Various	77.641	0.000		0.000		0.000		-		0.000	0.000	77.641	-
		Subtotal	1,284.518	67.132		10.670		0.764		-		0.764	0.000	1,363.084	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Evaluation	Various	NAWC WD : China Lake, CA	40.545	2.712	Nov 2016	0.000		0.000		-		0.000	0.000	43.257	-
Developmental Test and Evaluation	Various	NAWC AD : Patuxent River, MD	752.168	54.944	Nov 2016	4.400	Nov 2017	0.000		-		0.000	0.000	811.512	-
Developmental Test and Evaluation	Various	Edwards AFB : Edwards AFB, CA	683.943	54.976	Nov 2016	4.400	Nov 2017	0.000		-		0.000	0.000	743.319	-
Developmental Test and Evaluation - Other (including Classified PIDs)	Various	Other (incl Classified PIDs) : Various	241.272	30.602	Nov 2016	2.400	Nov 2017	0.000		-		0.000	0.000	274.274	-
Operational Test and Evaluation Support	Various	OT-AFOTEC/ AFFTC : Kirkland AFB, NM/Eglin AFB, FL	204.545	35.436	Nov 2016	41.976	Nov 2017	2.150	Nov 2018	-		2.150	0.000	284.107	-
Operational Test and Evaluation Support	Various	OT-JITC/OPTEC : Various	61.243	42.956	Nov 2016	71.886	Nov 2017	2.143	Nov 2018	-		2.143	0.000	178.228	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	Project (Number/Name) 2262 / *Joint Strike Fighter EMD STOVL*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test and Evaluation Support	Various	OT-CHLK : China Lake, CA	3.999	9.912	Nov 2016	15.392	Nov 2017	0.000		-		0.000	0.000	29.303	-
Operational Test and Evaluation Support	Various	OT-Various : Various	7.823	2.775	Nov 2016	3.274	Nov 2017	0.000		-		0.000	0.000	13.872	-
Prior Year No Longer Funded in FYDP	Various	Various : Various	27.829	0.000		0.000		0.000		-		0.000	0.000	27.829	-
		Subtotal	2,023.367	234.313		143.728		4.293		-		4.293	0.000	2,405.701	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Security System High BOS	C/FP	Mantech : Arlington, VA	7.845	8.037	Dec 2016	0.000		0.000		-		0.000	0.000	15.882	15.882
AFLCMC Civilian Pay	Various	AFLCMC CIVPAY : Wright Patterson, AFB, OH	120.311	10.270	Oct 2016	0.000		0.000		-		0.000	0.000	130.581	-
Program Management Support	C/CPFF	Allutiiq : Arlington, VA	2.213	0.192	Dec 2016	0.000		0.000		-		0.000	0.000	2.405	2.405
Facilities BOSS	WR	Various : Various	32.772	9.013	Dec 2016	0.000		0.000		-		0.000	0.000	41.785	-
CIO ODCs	Various	Various : Various	13.021	7.256	Dec 2016	0.000		0.000		-		0.000	0.000	20.277	-
Travel	Various	Various : Various	24.830	2.343	Oct 2016	0.088	Dec 2017	0.000		-		0.000	0.000	27.261	-
Program Management Support	Various	Jacobs BOSS : Arlington, VA	50.440	24.686	Dec 2016	0.000		0.000		-		0.000	0.000	75.126	-
OPS - Cost/FM/EV ACT-I	Various	OPS - Cost/FM/EV : Arlington, VA	2.000	3.845	Dec 2016	0.000		0.000		-		0.000	0.000	5.845	-
Program Management Support	Various	Andrews AFB : Camp Springs, MD	0.358	0.135	Dec 2016	0.000		0.000		-		0.000	0.000	0.493	-
Prior Year No Longer Funded in FYDP	Various	Various : Various	593.944	0.000		0.000		0.000		-		0.000	0.000	593.944	-
		Subtotal	847.734	65.777		0.088		0.000		-		0.000	0.000	913.599	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	Project (Number/Name) 2262 / *Joint Strike Fighter EMD STOVL*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	49,044.533	1,394.043		527.873		196.622		-		196.622	16.771	51,179.842	N/A
Joint Strike Fighter 0604800F	-	386.941		255.745		69.519		-		69.519			-
Joint Strike Fighter 0604800N	-	489.144		103.144		60.537		-		60.537			-
International Partner	-	22.000		27.450		-		-		-			-
Project Cost Totals	49,044.533	495.958		141.534		66.566		-		66.566	16.771	51,179.842	-

Remarks

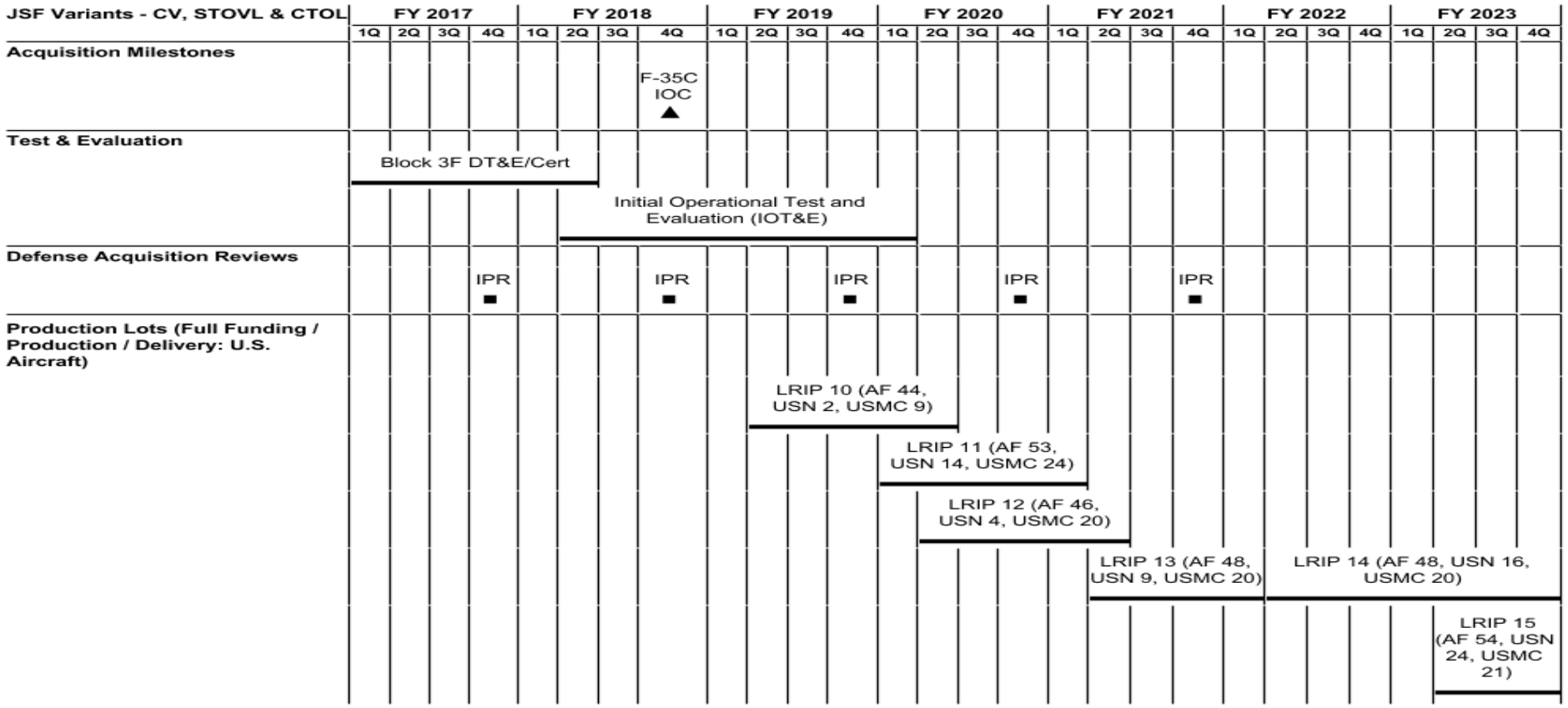
Subtotals and totals may not add due to rounding.

NOTE 1: Prior Years reflect $21,601.831M USAF/$19,311.879M USN/$3,166.810M USMC /$4,964.013 International/Total $49,044.533M
FY 2017 reflects $386.941M USAF/$489.144M USN/$495.958M USMC/$22.000M International/Total $1,394.043M
FY 2018 reflects $255.745M USAF/$103.144M USN/$141.534M USMC/$27.450M International/Total $ 527.873M
FY 2019 reflects $ 69.519M USAF/$ 60.537M USN/$ 66.566M USMC/$ 0.000M International/Total $ 196.622M

JSF EMD Includes:
USAF PE 0604800F BPAC 653831
USN PE 0604800N Project Unit 2261
USMC PE 0604800M Project Unit 2262

D&S Includes:
USAF PE 0604800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*



2019PB - 0604800M - 2262

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JSF Variants - CV, STOVL & CTOL				
Acquisition Milestones: F-35C Initial Operational Capability	4	2018	4	2018
Test & Evaluation: Test and Evaluation: Block 3F DT&E/Cert	1	2017	2	2018
Test & Evaluation: Test and Evaluation: Initial Operational Test and Evaluation (IOT&E)	2	2018	1	2020
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-17	4	2017	4	2017
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-18	4	2018	4	2018
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-19	4	2019	4	2019
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-20	4	2020	4	2020
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-21	4	2021	4	2021
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 10 Full Funding / Production / Delivery	2	2019	2	2020
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 11 Full Funding / Production / Delivery	1	2020	1	2021
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 12 Full Funding / Production / Delivery	2	2020	2	2021
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 13 Full Funding / Production / Delivery	2	2021	1	2022
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 14 Full Funding / Production / Delivery	2	2022	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2262 / *Joint Strike Fighter EMD STOVL*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 15 Full Funding / Production / Delivery	2	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*				Project (Number/Name) 3350 / *F-35B Sustainment/Capability Enhancements*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3350: *F-35B Sustainment/ Capability Enhancements*	338.445	23.435	11.400	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	373.280
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 198

Note

Total cost including United States Navy (USN), United States Marine Corps (USMC), United States Air Force (USAF) and International Partner contributions funding is: FY17 $125.862M, FY18 $61.270M and FY19 $ 4.957M.

R-2A table shown above reflect service funding only.

R-2A (section B)/R-3 displays total combined program (i.e. not Service-specific), including International partners.

D&S Includes:
USAF PE 64800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

A. Mission Description and Budget Item Justification

Funds enhancements to the deployability and suitability of the air system such as low observable (LO) maintenance enhancements, security architecture updates, redesign of obsolete items, and integrated training simulators. These enhancements will provide vital on-demand support to the war-fighter within a deployed environment and are not funded via the existing System Development and Demonstration (SDD) program or tied to Block 4 Operational Flight Program development. Funding will result in achieving targeted suitability, maintainability, and affordability returns employing the F-35 in deployed or austere locations.

-Funding at the accomplishment/planned program level is reported as the total of all services as these activities support all aircraft variants. By agreement, USN and USMC funding shares are approximately equal and when combined are equal to the USAF share.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Sustainment and Capability Enhancements	75.280	26.030	4.957	0.000	4.957
Articles:	-	-	-	-	-
Description: Apply disciplined systems engineering, refinement of requirements, develop and acquire					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
suitability and maintainability of the air system such as decentralized maintenance capabilities, LO maintenance enhancements, security architecture updates, redesign of obsolete items and integrated training simulators. ***FY 2018 Plans:*** Continue to conduct systems engineering, technical maturation, integration and test planning for suitability and deployability enhancements. Continue to perform sustaining engineering, development and test activities necessary to gain capacity, compatibility, and expansion in wiring, power, wing conduits, etc. in support of electronic warfare. This includes funding for suitability enhancements such as Standard Operating Unit Version 2 and Band 2/5 efforts. ***FY 2019 Base Plans:*** Continue to conduct systems engineering, technical maturation, integration and test planning for suitability and deployability enhancements. Continue to perform sustaining engineering, development and test activities necessary to gain capacity, compatibility, and expansion in wiring, power, wing conduits, etc. in support of electronic warfare. This includes funding for suitability enhancements related to Distributed Mission Training (DMT). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 Sustainment/Capability Enhancements funding decrease is due to reduction in domestic and International controls in cojunction with SDD phase drawing to closure.					
Title: Development Support	3.556	1.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: SDD support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2018 Plans:*** Complete SDD support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. Development Support decrease is due to across the board reduction between both services. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 Sustainment/Capability Enhancements funding decrease is due to reduction in domestic and International controls in cojunction with SDD phase drawing to closure.					
Title: Development Test and Evaluation ***Articles:*** ***Description:*** Verification and testing for deployability and suitability enhancements. ***FY 2018 Plans:*** Complete to initiate government test and evaluation of capability enhancements for Deployable Autonomic Logistics Information system, and LO maintenance enhancements. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 Sustainment/Capability Enhancements funding decrease is due to reduction in domestic and International controls in cojunction with SDD phase drawing to closure.	1.440 -	0.500 -	0.000 -	0.000 -	0.000 -
Title: Autonomic Logistics Information System ***Articles:*** ***Description:*** SDD execution of Autonomic Logistics Information System (ALIS) develops the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2018 Plans:***	45.586 -	33.740 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete SDD execution of Autonomic Logistics Information System (ALIS) develops the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 Sustainment/Capability Enhancements funding decrease is due to reduction in domestic and International controls in cojunction with SDD phase drawing to closure.					
Accomplishments/Planned Programs Subtotals	125.862	61.270	4.957	0.000	4.957
Joint Strike Fighter 0604800N 3352	23.518	5.787	4.957	-	4.957
International Partner	31.947	6.881	-	-	-
Joint Strike Fighter 0604800F	46.962	37.202	-	-	-
Navy Subtotals	23.435	11.400	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E/0604800F: *F-35A Joint Strike Fighter*	388.660	255.745	69.655	-	69.655	7.796	5.598	0.000	0.000	0.000	22,247.823
• International: *International Partner (SDD)*	22.000	27.450	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5,013.463
• APAF/0207142F BP10: *F-35A USAF CTOL*	4,667.894	4,544.684	4,253.696	-	4,253.696	4,209.813	4,862.684	4,796.042	0.000	148,685.767	202,884.710
• RDT&E/0604800N/2261: *F-35C Joint Strike Fighter (JSF) - EMD*	489.144	103.144	60.537	-	60.537	1.499	0.328	0.323	0.345	0.000	49,699.853
• APN/0605B: *F-35B Joint Strike Fighter STOVL Spares*	123.252	105.671	92.198	-	92.198	160.150	140.989	143.809	0.000	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0605C: *F-35C Joint Strike Fighter CV Spares*	26.076	84.591	44.971	-	44.971	52.858	303.608	309.680	0.000	Continuing	Continuing
• MILCON 0207142F: *USAF MILCON Operations*	305.700	181.250	175.150	-	175.150	154.400	0.000	0.000	0.000	0.000	1,602.550
• APAF/0207142F BP11: *USAF Modification Funding*	115.811	68.270	230.448	-	230.448	279.814	259.978	301.899	0.000	0.000	1,665.794
• FOD/0207142F: *USAF Follow-on Development (FoD)*	50.970	299.408	396.821	-	396.821	504.971	418.988	343.147	283.292	Continuing	Continuing
• 0207142F/USAF BP16: *USAF Joint Strike Fighter Initial Spares*	362.792	320.831	319.151	-	319.151	416.722	399.361	394.654	0.000	4,175.007	7,849.413
• USAF/OPAF 0207142F: *USAF OPAF*	2.333	3.326	3.310	-	3.310	2.993	2.463	2.507	0.000	Continuing	Continuing
• APN/0592: *F-35B STOVL Series*	24.350	34.963	36.618	-	36.618	38.582	47.609	50.163	53.742	Continuing	Continuing
• APN/0593: *F-35C CV Series*	21.733	31.689	21.236	-	21.236	13.136	12.435	12.683	12.938	Continuing	Continuing
• RDT&E/0604800N/3352: *F-35C Sustainment/ Capability Enhancements*	23.518	5.787	4.957	-	4.957	0.000	0.000	0.000	0.000	0.000	372.707
• USAF SDD BP 653832: *Deployability and Suitability Enhancements*	45.243	37.202	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	236.880
• PAF/0207142F BP10: *F-35A JSF CTOL Advance Procurement*	404.500	780.300	405.200	-	405.200	1,003.600	965.300	414.700	0.000	20,154.954	26,885.296
• DCA/0207142F 676011: *Dual Capable Aircraft (DCA)*	25.743	35.122	78.016	-	78.016	92.026	95.040	37.599	11.725	Continuing	Continuing
• APN/0147: *F-35C Joint Strike Fighter CV*	1,360.880	663.232	1,341.369	-	1,341.369	1,938.799	2,793.290	2,963.544	2,973.130	26,243.243	54,674.071
• APN/0152C: *F-35B Joint Strike Fighter STOVL AP*	233.648	413.450	228.492	-	228.492	215.704	209.222	225.245	229.749	1,651.860	4,696.946
• APN/0152: *F-35B Joint Strike Fighter STOVL*	2,504.927	2,631.787	2,635.111	-	2,635.111	2,700.264	2,658.313	2,666.245	2,851.920	20,419.570	47,203.890
• DoN MILCON: *DoN JSF MILCON*	230.900	64.660	121.990	-	121.990	119.800	0.000	0.000	0.000	642.400	1,406.074

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• International 2: *International Production/Reprogramming Lab*	185.641	124.114	151.776	-	151.776	150.588	149.848	87.119	0.000	Continuing	Continuing
• OPN/4268: *Logistics Information System (ALIS)*	29.528	63.277	39.374	-	39.374	51.957	55.434	70.046	71.314	Continuing	Continuing
• MC/0207597F: *USAF MILCON Training*	20.000	70.350	11.000	-	11.000	0.000	0.000	0.000	0.000	0.000	166.750
• International 3: *International R&D FoM/D&S*	84.602	158.273	159.649	-	159.649	162.023	167.383	160.111	0.000	Continuing	Continuing
• OPN 902010 S8JC: *Aviation Support Equipment (ALIS)*	0.881	2.297	2.321	-	2.321	0.139	1.977	0.000	0.000	Continuing	Continuing
• USAF O&M: *USAF O&M*	425.978	516.569	731.134	-	731.134	909.930	985.790	1,089.394	0.000	Continuing	Continuing
• USAF MILCON 0502635F: *USAF MILCON Air National Guard*	15.100	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.100
• USN 2936: *F-35C Follow-on Development (CV)*	63.387	139.942	224.712	-	224.712	228.707	188.678	120.192	0.000	Continuing	Continuing
• International Unique: *Imtl Unique (SDD/PSFD)*	32.374	15.566	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	481.617

Remarks

D. Acquisition Strategy

Implement Joint Strike Fighter Joint Executive Steering Board/Configuration Steering Board approved enhancements to existing capabilities through existing contracts using the engineering change proposal process. When appropriate, new cost type contracts may be established.

E. Performance Metrics

The following are the key performance parameters from the F-35 Selected Acquisition Report:

Performance Metrics reflect Key Program Performance data.

Combat Radius
F-35A Meets/Exceeds Tripwire Requirement
F-35B Meets/Exceeds Tripwire Requirement
F-35C Meets/Exceeds Tripwire Requirement

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*

F-35B Performance
Flat Deck (High-High-High Profile Fuel) Meets Requirement In Tripwire Band
Ski Jump (High-Medium-Medium-High Profile Fuel) Meets Requirement In Tripwire Band
Vertical Landing Bring Back Meets Requirement In Tripwire Band

F-35C Recovery
Maximum Approach Speed Meets Requirement In Tripwire Band

Interoperability
Net Ready Criteria- Meets Requirement In Tripwire Band

Radio Frequency Signature Meets/Exceeds Tripwire Requirement

Force Protection
CB Pilot Protection (New Key Performance Parameters Per CN3) - Meets/Exceeds Tripwire Requirement

Mission Reliability
F-35A Meets/Exceeds Tripwire Requirement
F-35B United States Marine Corps (USMC) Meets/Exceeds Tripwire Requirement
F-35B United Kingdom (UK) Meets/Exceeds Tripwire Requirement
F-35C Exceeds Operational Requiremets Document Objective

Sortie Generation Rate
F-35A Meets/Exceeds Tripwire Requirement
F-35B USMC Meets/Exceeds Tripwire Requirement
F-35B UK Meets/Exceeds Tripwire Requirement
F-35C Meets/Exceeds Tripwire Requirement

Logistics Footprints
F-35A Meets/Exceeds Tripwire Requirement
F-35B USMC Meets/Exceeds Tripwire Requirement

Logistics Footprint- Volume
F-35B USMC Exceeds ORD Objective

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*

F-35B UK Meets/Exceeds Tripwire Requirement
F-35C Exceeds Operational Requirements Document (ORD) Objective

Logistics Footprint-Weight
F-35B USMC Exceeds ORD Objective
F-35B UK Meets/Exceeds Tripwire Requirement
F-35C Exceeds ORD Objective

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	Project (Number/Name) 3350 / *F-35B Sustainment/Capability Enhancements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - 3002 SDD	C/CPFF	Lockheed Martin : Fort Worth, TX	44.233	45.572	Mar 2017	23.655	Mar 2018	4.957	Mar 2019	-		4.957	0.000	118.417	116.732
Primary Hardware Development - 3002 ALIS	C/CPFF	Lockheed Martin : Fort Worth, TX	144.378	40.768	Mar 2017	33.740	Mar 2018	0.000		-		0.000	0.000	218.886	218.886
Primary Hardware Development -14-C-002 Band 2/5	C/CPFF	Lockheed Martin : Fort Worth, TX	98.639	34.526	Mar 2017	2.375	Mar 2018	0.000		-		0.000	0.000	135.540	135.540
		Subtotal	287.250	120.866		59.770		4.957		-		4.957	0.000	472.843	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	AFLCMC : Eglin AFB	33.501	0.000		0.000		0.000		-		0.000	0.000	33.501	-
Development Support	Various	Various : Various	12.368	2.410	Mar 2017	1.000	Mar 2018	0.000		-		0.000	0.000	15.778	-
		Subtotal	45.869	2.410		1.000		0.000		-		0.000	0.000	49.279	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	Various : Various	2.010	0.976	Mar 2017	0.500	Mar 2018	0.000		-		0.000	0.000	3.486	-
		Subtotal	2.010	0.976		0.500		0.000		-		0.000	0.000	3.486	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support	Various	Various : Various	3.316	1.610	Mar 2017	0.000		0.000		-		0.000	0.000	4.926	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			3.316	1.610		0.000		0.000		-		0.000	0.000	4.926	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	338.445	125.862		61.270		4.957		-		4.957	0.000	530.534	N/A
Joint Strike Fighter 0604800N 3352	-	23.518		5.787		4.957		-		4.957			-
International Partner	-	31.947		6.881		-		-		-			-
Joint Strike Fighter 0604800F	-	46.962		37.202		-		-		-			-
Project Cost Totals	338.445	23.435		11.400		0.000		-		0.000	0.000	530.534	-

Remarks

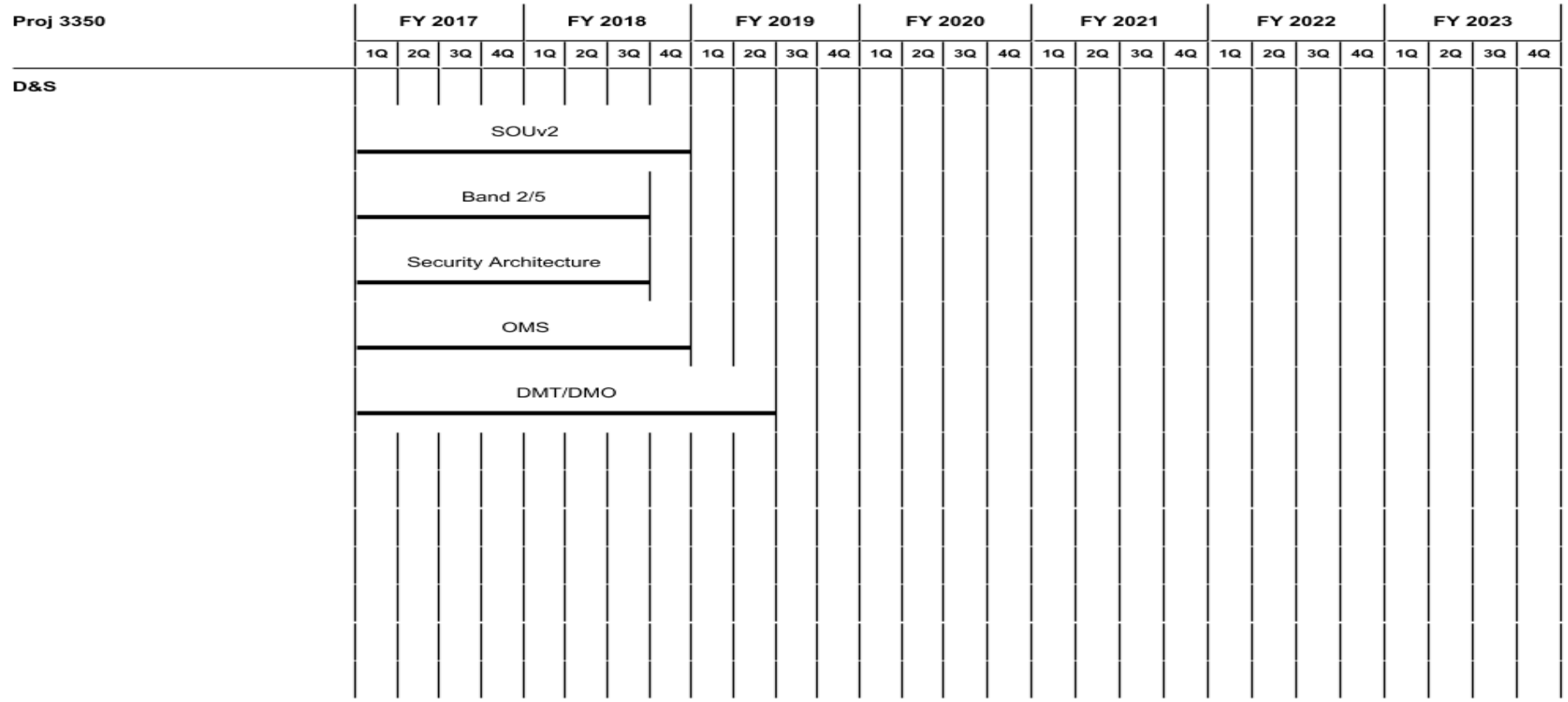
NOTE: Prior Years reflect $154.435M USAF/$68.518M USN/$58.740M USMC/$56.752M International/Total $338.445M
FY 2017 reflects $46.962M USAF/$23.518M USN/$23.435M USMC/$31.947M International/Total $125.862M
FY 2018 reflects $37.202M USAF/$ 5.787M USN/$11.400M USMC/$ 6.881M International/Total $ 61.270M
FY 2019 reflects $ 0.000M USAF/$ 4.957M USN/$ 0.000M USMC/$ 0.000M International/Total $ 4.957M

R-2A (section B)/R-3 displays total combined program (i.e. not Service-specific), including International partners.

JSF EMD Includes:
USAF PE 0604800F BPAC 653831
USN PE 0604800N Project Unit 2261
USMC PE 0604800M Project Unit 2262

D&S Includes:
USAF PE 0604800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*



2019DON - 0604800M - 3350

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800M / *(U)Joint Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3350 / *F-35B Sustainment/Capability Enhancements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3350				
D&S: Standard Operating Unit (SOUv2)	1	2017	4	2018
D&S: Band 2/5	1	2017	3	2018
D&S: Security Architecture	1	2017	3	2018
D&S: Offboard Misson Support (OMS) Redesign	1	2017	4	2018
D&S: Distributed Mission Training/Distributed Mission Operations (DMT/DMO)	1	2017	2	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604800N *I JT Strike Fighter (JSF) - EMD*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	49,382.978	512.662	108.931	65.494	-	65.494	1.499	0.328	0.323	0.345	0.000	50,072.560
2261: *Joint Strike Fighter EMD*	49,044.533	489.144	103.144	60.537	-	60.537	1.499	0.328	0.323	0.345	0.000	49,699.853
3352: *F-35C Sustainment/ Capability Enhancements*	338.445	23.518	5.787	4.957	-	4.957	0.000	0.000	0.000	0.000	0.000	372.707
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 198												

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the USN, USAF, USMC and allies. The three variants are the F-35A conventional takeoff and landing; F-35B short takeoff and vertical landing; and the F-35C Aircraft Carrier suitable variant. The F-35A will be a stealthy multi-role aircraft, primary air-to-ground for the Air Force to replace the F-16 and A-10 and complement the F-22. The F-35B variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18 for the Marine Corps, replace the Sea Harrier and GR 7 for the United Kingdom, and replace the AV-8 currently employed by the Italian Navy. The F-35C will provide the Department of the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F.

The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark, Norway, and Foreign Military Sales customers are also participants in the JSF program. The program shown here reflects USN, USMC, USAF, and International Partner funding.

Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants.

The System Development and Demonstration (SDD) budget funds a total quantity of 20 RDT&E test articles to include 6 ground test articles and 14 flight test articles for USN, USMC, and USAF use.

FY07: 1 F-35A flight test article
FY08: 1 F-35B flight test article; 1 F-35B ground test article
FY09: 1 F-35B flight test article; 2 F-35A ground test articles
FY10: 6 flight test articles: 3 F-35A, 2 F-35B, 1 F-35C; 3 ground test articles: 1 F-35B, 2 F-35C
FY11: 4 flight test articles: 1 F-35A, 1 F-35B, 2 F-35C
FY13: 1 F-35C flight test article

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SDD because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604800N *I JT Strike Fighter (JSF) - EMD*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	528.716	108.931	66.174	-	66.174
Current President's Budget	512.662	108.931	65.494	-	65.494
Total Adjustments	-16.054	0.000	-0.680	-	-0.680
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-16.054	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.680	-	-0.680

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604800N / *JT Strike Fighter (JSF) - EMD*				Project (Number/Name) 2261 / *Joint Strike Fighter EMD*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2261: *Joint Strike Fighter EMD*	49,044.533	489.144	103.144	60.537	-	60.537	1.499	0.328	0.323	0.345	0.000	49,699.853
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 198												

Note

Total cost including United States Navy (USN), United States Marine Corps (USMC), International partner contributions and United States Air Force (USAF) funding are: FY17 $1,394.043M, FY18 $ 527.873M and FY19 $196.622M R-2 data reflects variant unique funding only.

R-2A(section B)/R-3 displays total combined Program (i.e. not Service specific), including International partners.

JSF EMD Includes:
USAF PE 0604800F BPAC 653831
USN PE 0604800N Project Unit 2261
USMC PE 0604800M Project Unit 2262

D&S Includes:
USAF PE 0604800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the USN, USAF, USMC and allies. The three variants are the F-35A conventional takeoff and landing; F-35B short takeoff and vertical landing; and the F-35C Aircraft Carrier suitable variant. The F-35A will be a stealthy multi-role aircraft, primary air-to-ground for the Air Force to replace the F-16 and A-10 and complement the F-22. The F-35B variant will be a multi-role strike fighter aircraft to replace the AV-8B and F/A-18 for the Marine Corps, replace the Sea Harrier and GR 7 for the United Kingdom, and replace the AV-8 currently employed by the Italian Navy. The F-35C will provide the Department of the Navy a multi-role, stealthy strike fighter aircraft to complement the F/A-18E/F.

The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark, Norway, and Foreign Military Sales customers are also participants in the JSF program. The program shown here reflects USN, USMC, USAF, and International Partner funding.

The top-line Program Element reflects the unique variant for each Service. Funding at the accomplishment/planned program level is reported as the total of all services and partners as these activities support all aircraft variants.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

The System Development and Demonstration (SDD) budget funds a total quantity of 20 RDT&E test articles to include 6 ground test articles and 14 flight test articles for USN, USAF, and USMC use.

FY07: 1 F-35A flight test article
FY08: 1 F-35B flight test article; 1 F-35B ground test article
FY09: 1 F-35B flight test article; 2 F-35A ground test articles
FY10: 6 flight test articles: 3 F-35A, 2 F-35B, 1 F-35C; 3 ground test articles: 1 F-35B, 2 F-35C
FY11: 4 flight test articles: 1 F-35A, 1 F-35B, 2 F-35C
FY13: 1 F-35C flight test article

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: System Development and Demonstration (SDD)	883.024	331.782	164.165	0.000	164.165
Articles:	-	-	-	-	-
Description: SDD execution of the Air System (Lockheed Martin) including International Commonality Efforts; includes airframe, vehicle and mission systems, autonomic logistics, systems engineering & test efforts.					
FY 2018 Plans: Continue SDD execution of Air System Lockheed Martin, including International Commonality Effort which includes, airframe, vehicle systems, mission systems, autonomic logistics, systems engineering, and integrated test efforts. Activity aligned to IMS in accordance with variant IOC.					
FY 2019 Base Plans: Continue SDD execution of Air System Lockheed Martin, including International Commonality Effort which includes, airframe, vehicle systems, mission systems, autonomic logistics, systems engineering, and integrated test efforts. Activity aligned to IMS in accordance with variant IOC.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: F135 Propulsion System	120.000	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: SDD execution of the F135 Propulsion System (Pratt & Whitney) including International Commonality Effort; includes testing, autonomic logistics, integration & performing technology maturation efforts. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: Systems Engineering (SE)	28.181	0.912	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: SDD SE including systems operations requirements analysis, program integration, requirements integration, and interoperability support. ***FY 2018 Plans:*** Continue SDD SE, including systems operations requirements analysis, program integration, requirements integration, and interoperability support. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: Test and Evaluation (T&E)	281.672	143.809	4.293	0.000	4.293
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Government DT&E/Operational Testing (OT) in support of first flight of test aircraft. Elements of DT&E include preparation for flight testing and weapons integration testing. ***FY 2018 Plans:*** Continue government DT&E/OT in support of test aircraft. Continue flight sciences testing of CTOL, STOVL, and CV variants to expand air vehicle envelope and support mission systems testing. Elements of DT&E include flight testing, weapons integration testing, and component capabilities testing. ***FY 2019 Base Plans:*** Continue government DT&E/OT in support of test aircraft. Continue flight sciences testing of CTOL, STOVL, and CV variants to expand air vehicle envelope and support mission systems testing. Elements of DT&E include flight testing, weapons integration testing, and component capabilities testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: Development Support	80.945	10.676	0.764	0.000	0.764
Articles:	-	-	-	-	-
Description: SDD Support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2018 Plans:*** Continue SDD support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2019 Base Plans:*** Continue SDD support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.					
Title: Autonomic Logistics Information System (ALIS) ***Articles:*** ***Description:*** SDD execution of Autonomic Logistics Information System (ALIS) develops the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2018 Plans:*** Continue SDD execution of ALIS to develop the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2019 Base Plans:*** Continue SDD execution of ALIS to develop the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease is due to reduction in domestic and International controls as SDD phase draws to closure.	0.221 -	40.694 -	27.400 -	0.000 -	27.400 -
Accomplishments/Planned Programs Subtotals	1,394.043	527.873	196.622	0.000	196.622
Joint Strike Fighter 0604800F	386.941	255.745	69.519	-	69.519
Joint Strike Fighter 0604800M	495.958	141.534	66.566	-	66.566
International Partner	22.000	27.450	-	-	-
Navy Subtotals	489.144	103.144	60.537	0.000	60.537

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800N / *JT Strike Fighter (JSF) - EMD*	Project (Number/Name) 2261 / *Joint Strike Fighter EMD*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E/0604800F: *F-35A Joint Strike Fighter SDD*	386.941	255.745	69.519	-	69.519	7.793	5.596	0.000	0.000	0.000	22,245.963
• International: *International Partner (SDD)*	22.000	27.450	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5,013.463
• APAF/0207142F BP10: *F-35A USAF CTOL*	4,667.894	4,544.684	4,253.696	-	4,253.696	4,209.813	4,862.684	4,796.042	0.000	148,685.767	202,884.710
• RDT&E/0604800M/2262: *F-35B JT Strike Fighter (JSF) - EMD*	495.958	141.534	66.566	-	66.566	1.713	0.542	0.558	0.569	0.000	49,751.973
• APN/0605B: *F-35B Joint Strike Fighter STOVL Spares*	123.252	105.671	92.198	-	92.198	160.150	140.989	143.809	0.000	Continuing	Continuing
• APN/0605C: *F-35C Joint Strike Fighter CV Spares*	26.076	84.591	44.971	-	44.971	52.858	303.608	309.680	0.000	Continuing	Continuing
• MILCON 0207142F: *USAF MILCON Operations*	305.700	181.250	175.150	-	175.150	154.400	0.000	0.000	0.000	0.000	1,602.550
• APAF/0207142F BP11: *USAF Modification Funding*	115.811	68.270	230.448	-	230.448	279.814	259.978	301.899	0.000	0.000	1,665.794
• FOD/0207142F: *USAF Follow-on-Development (FoD)*	50.970	299.408	396.821	-	396.821	504.971	418.988	343.147	283.292	Continuing	Continuing
• 0207142F/USAF BP16: *USAF Joint Strike Fighter Initial Spares*	362.792	320.831	319.151	-	319.151	416.722	399.361	394.654	0.000	4,175.007	7,849.413
• USAF/OPAF 0207142F: *USAF OPAF*	2.333	3.326	3.310	-	3.310	2.993	2.463	2.507	0.000	Continuing	Continuing
• APN/0592: *F-35B STOVL Serious*	24.350	34.963	36.618	-	36.618	38.582	47.609	50.163	53.742	Continuing	Continuing
• APN/0593: *F-35C CV Serious*	21.733	31.689	21.236	-	21.236	13.136	12.435	12.683	12.938	Continuing	Continuing
• RDT&E/0604800M/3350: *F-35B Sustainment/ Capability Enhancements*	23.435	11.400	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	373.280
• USAF SDD BP 653832: *Deployability and Suitability Enhancements*	45.243	37.202	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	239.440
• PAF/0207142F BP10: *F-35A JSF CTOL Advance Procurement*	404.500	780.300	405.200	-	405.200	1,003.600	965.300	414.700	0.000	20,154.954	26,885.296

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• DCA/0207142F 676011: *Dual Capable Aircraft (DCA)*	25.743	35.122	47.016	-	47.016	49.026	67.040	62.599	0.000	Continuing	Continuing
• APN/0147: *F-35C Joint Strike Fighter CV*	1,360.880	663.232	1,341.369	-	1,341.369	1,938.799	2,793.290	2,963.544	2,973.130	26,243.243	54,674.071
• APN/0152C: *F-35B Joint Strike Fighter STOVL AP*	233.648	413.450	228.492	-	228.492	215.704	209.222	225.245	229.749	1,651.860	4,696.946
• APN/0152: *F-35B Joint Strike Fighter STOVL*	2,504.927	2,631.787	2,635.111	-	2,635.111	2,700.264	2,658.313	2,666.245	2,851.920	20,419.570	47,203.890
• DoN MILCON: *DoN JSF MILCON*	230.900	64.660	121.990	-	121.990	119.800	0.000	0.000	0.000	642.400	1,406.074
• International 2: *Intl Production/ Reprogramming Lab*	185.641	124.114	151.776	-	151.776	150.588	149.848	87.119	0.000	Continuing	Continuing
• OPN/4268: *Logistics Information System (ALIS)*	29.528	63.277	39.374	-	39.374	51.457	54.934	70.046	71.314	Continuing	Continuing
• MC/0207597F: *USAF MILCON Training*	20.000	70.350	11.000	-	11.000	0.000	0.000	0.000	0.000	0.000	166.750
• International 3: *International R&D FoD/D&S*	84.602	158.273	159.649	-	159.649	162.023	167.383	160.111	0.000	Continuing	Continuing
• OPN 902010 S8JC: *Aviation Support Equipment (ALIS)*	0.881	2.297	2.321	-	2.321	0.139	1.977	0.000	0.000	Continuing	Continuing
• USAF O&M: *USAF O&M*	425.978	516.569	731.134	-	731.134	909.930	985.790	1,089.394	0.000	Continuing	Continuing
• USAF MILCON 0502635F: *USAF MILCON Air National Guard*	15.100	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.100
• USN 2936: *F-35C Follow-on Development (CV)*	63.387	139.942	224.712	-	224.712	228.707	188.678	120.192	0.000	Continuing	Continuing
• International Unique: *Intl Unique (SDD)*	32.374	15.566	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	481.617

Remarks

D. Acquisition Strategy

The SDD program consists of a cost-reimbursement contract awarded to Lockheed Martin Aeronautics Company to develop the F-35 Air System, consisting of three aircraft variants and its associated logistics support system, for the U.S. Services and international participants. Similarly, a cost-reimbursement contract was awarded to Pratt & Whitney to develop the F135 propulsion system. Ground and flight testing will be conducted during development to accomplish validation and verification, with

the extensive use of modeling and simulation to offset the risk of this large, complex, and concurrent lifecycle program. A comprehensive logistics support environment, including an integrated training system for aircrew, maintenance, and support personnel, is also being developed.

On 25 April 2011, the Department of Defense terminated the development of the General Electric Rolls-Royce Fighter Engine Team F136 propulsion system.

The F-35 Program has made international involvement a key element of the acquisition strategy. This includes international partnership in the development, production, and sustainment phases of the lifecycle. Additional international participation includes Foreign Military Sales arrangements.

In Fiscal Year 2007, separate cost-type contracts were awarded to Lockheed Martin Aeronautics Company and Pratt & Whitney to begin low rate initial production for F-35 air vehicles, propulsion systems, and sustainment for the fielded systems. Transition to fixed-price-type procurement contracts occurred with the fourth low rate lot. To provide logistics support for delivered aircraft, Performance-Based Logistics cost-type contracts will be awarded to Lockheed Martin Aeronautics Company and Pratt & Whitney.

At the completion of Low Rate Initial Production, a Defense Acquisition Board review, and Milestone Decision Authority approval, the F-35 Program will enter Full Rate Production. Fixed-price procurement contracts will be awarded for F-35 air vehicles and propulsion systems for the U.S. Services and international participants. Multiyear procurement authority for the F-35 Air System will be requested for Full Rate Production. Concurrently, a fixed-price-type Performance Based Logistics contracts for sustainment will be requested to support multi-Service and multi-national requirements.

E. Performance Metrics

The following are the key performance parameters from the F-35 Selected Acquisition Report:

Performance Metrics reflect Key Program Performance data.

Combat Radius
F-35A Meets/Exceeds Tripwire Requirement
F-35B Meets/Exceeds Tripwire Requirement
F-35C Meets/Exceeds Tripwire Requirement

CV Recovery Performance
Maximum Approach Speed at required carrier landing weight

Mission Reliability
F-35A Meets/Exceeds Tripwire Requirement
F-35B Meets/Exceeds Tripwire Requirement
F-35C Meets/Exceeds Tripwire Requirement

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

Sortie Generation Rate
F-35A Meets Tripwire Requirement
F-35B Meets Tripwire Requirement
F-35C Meets Tripwire Requirement

Logistics Footprint
F-35A Less than or equal to 8 C-17 equivalents
F-35B Less than or equal to 8 C-17 equivalents
F-35C Less than or equal to 38,800 cu ft., 217 ST

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - SDD	C/CPIF	Lockheed Martin : Ft. Worth, TX	31,298.696	731.806	Dec 2016	274.720	Dec 2017	161.665	Dec 2018	-		161.665	16.771	32,483.658	32,483.658
Primary Hardware Development - Award Fee	C/CPIF	Lockheed Martin : Ft. Worth, TX	1,727.259	11.430	Dec 2016	35.000	Dec 2017	2.500	Dec 2018	-		2.500	0.000	1,776.189	1,776.189
Primary Hardware Development - ALIS	C/CPIF	Lockheed Martin : Ft. Worth, TX	462.317	0.221	Dec 2016	40.694	Dec 2017	27.400	Dec 2018	-		27.400	0.000	530.632	530.632
Primary Hardware Development - 0031	C/CPFF	Lockheed Martin : Ft. Worth, TX	0.337	0.506	Dec 2016	0.169	Dec 2017	0.000		-		0.000	0.000	1.012	1.012
Primary Hardware Development - 0020	C/CPFF	Lockheed Martin : Ft. Worth, TX	81.838	139.281	Dec 2016	21.893	Dec 2017	0.000		-		0.000	0.000	243.012	243.012
Primary Hardware Development - SDD	C/CPIF	Pratt and Whitney : Hartford, CT	7,296.328	105.448	Dec 2016	0.000		0.000		-		0.000	0.000	7,401.776	7,401.776
Primary Hardware Development - Award Fee	C/CPIF	Pratt and Whitney : Hartford, CT	677.646	14.552	Dec 2016	0.000		0.000		-		0.000	0.000	692.198	692.198
Systems Engineering	Various	Various : Various	435.371	23.577	Nov 2016	0.911	Dec 2017	0.000		-		0.000	0.000	459.859	459.859
Prior Year No Longer Funded in FYDP	Various	Various : Various	2,909.122	0.000		0.000		0.000		-		0.000	0.000	2,909.122	2,909.122
		Subtotal	44,888.914	1,026.821		373.387		191.565		-		191.565	16.771	46,497.458	N/A

Remarks

Contract type prior to 2013 was CPAF.
Cumulative Award Fee earned in prior years for Lockheed Martin is 97%.
Cumulative Award Fee earned in prior years for Pratt and Whitney is 98%.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support - AFFTC/Eglin	Various	Eglin AFB : Eglin, FL	138.926	1.834	Nov 2016	0.830	Nov 2017	0.000		-		0.000	0.000	141.590	-
Development Support - AFLCMC/AFRL	Various	AFLCMC/AFRL : Various	75.829	3.133	Nov 2016	0.000		0.000		-		0.000	0.000	78.962	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800N / *JT Strike Fighter (JSF) - EMD*	Project (Number/Name) 2261 / *Joint Strike Fighter EMD*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engine Test and Evaluation Support - AEDC/Fuel	Various	Various : Various	199.947	3.771	Nov 2016	0.000		0.000		-		0.000	0.000	203.718	-
Development Support - Miscellaneous	Various	Various : Various	123.516	12.356	Nov 2016	2.927	Nov 2017	0.764	Nov 2018	-		0.764	0.000	139.563	-
Software Development Support	Various	NAWC WD : China Lake, CA	163.175	4.312	Nov 2016	0.000		0.000		-		0.000	0.000	167.487	-
Development Support	Various	NAWC AD : Patuxent River, MD	505.484	41.726	Nov 2016	6.913	Nov 2017	0.000		-		0.000	0.000	554.123	-
Prior Year No Longer Funded in FYDP	Various	Various : Various	77.641	0.000		0.000		0.000		-		0.000	0.000	77.641	-
		Subtotal	1,284.518	67.132		10.670		0.764		-		0.764	0.000	1,363.084	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Evaluation	Various	NAWC WD : China Lake, CA	40.545	2.712	Nov 2016	0.000		0.000		-		0.000	0.000	43.257	-
Developmental Test and Evaluation	Various	NAWC AD : Patuxent River, MD	752.168	54.944	Nov 2016	4.400	Nov 2017	0.000		-		0.000	0.000	811.512	-
Developmental Test and Evaluation	Various	Edwards AFB : Edwards AFB, CA	683.943	54.976	Nov 2016	4.400	Nov 2017	0.000		-		0.000	0.000	743.319	-
Developmental Test and Evaluation - Other (including Classified PIDs)	Various	Other (incl Classified PIDs) : Various	241.272	30.602	Nov 2016	2.400	Nov 2017	0.000		-		0.000	0.000	274.274	-
Operational Test and Evaluation Support	Various	OT-AFOTEC/ AFFTC : Kirkland AFB, NM/Eglin AFB, FL	204.545	35.436	Nov 2016	41.976	Nov 2017	2.150	Nov 2018	-		2.150	0.000	284.107	-
Operational Test and Evaluation Support	Various	OT-JITC/OPTEC : Various	61.243	42.956	Nov 2016	71.886	Nov 2017	2.143	Nov 2018	-		2.143	0.000	178.228	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800N / *JT Strike Fighter (JSF) - EMD*	Project (Number/Name) 2261 / *Joint Strike Fighter EMD*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test and Evaluation Support	Various	OT-CHLK : China Lake, CA	3.999	9.912	Nov 2016	15.392	Nov 2017	0.000		-		0.000	0.000	29.303	-
Operational Test and Evaluation Support	Various	OT-Various : Various	7.823	2.775	Nov 2016	3.274	Nov 2017	0.000		-		0.000	0.000	13.872	-
Prior Year No Longer Funded in FYDP	Various	Various : Various	27.829	0.000		0.000		0.000		-		0.000	0.000	27.829	-
		Subtotal	2,023.367	234.313		143.728		4.293		-		4.293	0.000	2,405.701	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Security System High BOS	C/FP	Mantech : Arlington, VA	7.845	8.037	Dec 2016	0.000		0.000		-		0.000	0.000	15.882	15.882
AFLCMC Civilian Pay	Various	AFLCMC CIVPAY : Wright Patterson, AFB, OH	120.311	10.270	Oct 2016	0.000		0.000		-		0.000	0.000	130.581	-
Program Management Support	C/CPFF	Allutiiq : Arlington, VA	2.213	0.192	Dec 2016	0.000		0.000		-		0.000	0.000	2.405	2.405
Facilities BOSS	WR	Various : Various	32.772	9.013	Dec 2016	0.000		0.000		-		0.000	0.000	41.785	-
CIO ODCs	Various	Various : Various	13.021	7.256	Dec 2016	0.000		0.000		-		0.000	0.000	20.277	-
Travel	Various	Various : Various	24.830	2.343	Oct 2016	0.088	Dec 2017	0.000		-		0.000	0.000	27.261	-
Program Management Support	Various	Jacobs BOSS : Arlington, VA	50.440	24.686	Dec 2016	0.000		0.000		-		0.000	0.000	75.126	-
OPS - Cost/FM/EV ACT-I	Various	OPS - Cost/FM/EV : Arlington, VA	2.000	3.845	Dec 2016	0.000		0.000		-		0.000	0.000	5.845	-
Program Management Support	Various	Andrews AFB : Camp Springs, MD	0.358	0.135	Dec 2016	0.000		0.000		-		0.000	0.000	0.493	-
Prior Year No Longer Funded in FYDP	Various	Various : Various	593.944	0.000		0.000		0.000		-		0.000	0.000	593.944	-
		Subtotal	847.734	65.777		0.088		0.000		-		0.000	0.000	913.599	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800N / *JT Strike Fighter (JSF) - EMD*	Project (Number/Name) 2261 / *Joint Strike Fighter EMD*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	49,044.533	1,394.043		527.873		196.622		-		196.622	16.771	51,179.842	N/A
Joint Strike Fighter 0604800F	-	386.941		255.745		69.519		-		69.519			-
Joint Strike Fighter 0604800M	-	495.958		141.534		66.566		-		66.566			-
International Partner	-	22.000		27.450		-		-		-			-
Project Cost Totals	49,044.533	489.144		103.144		60.537		-		60.537	16.771	51,179.842	-

Remarks

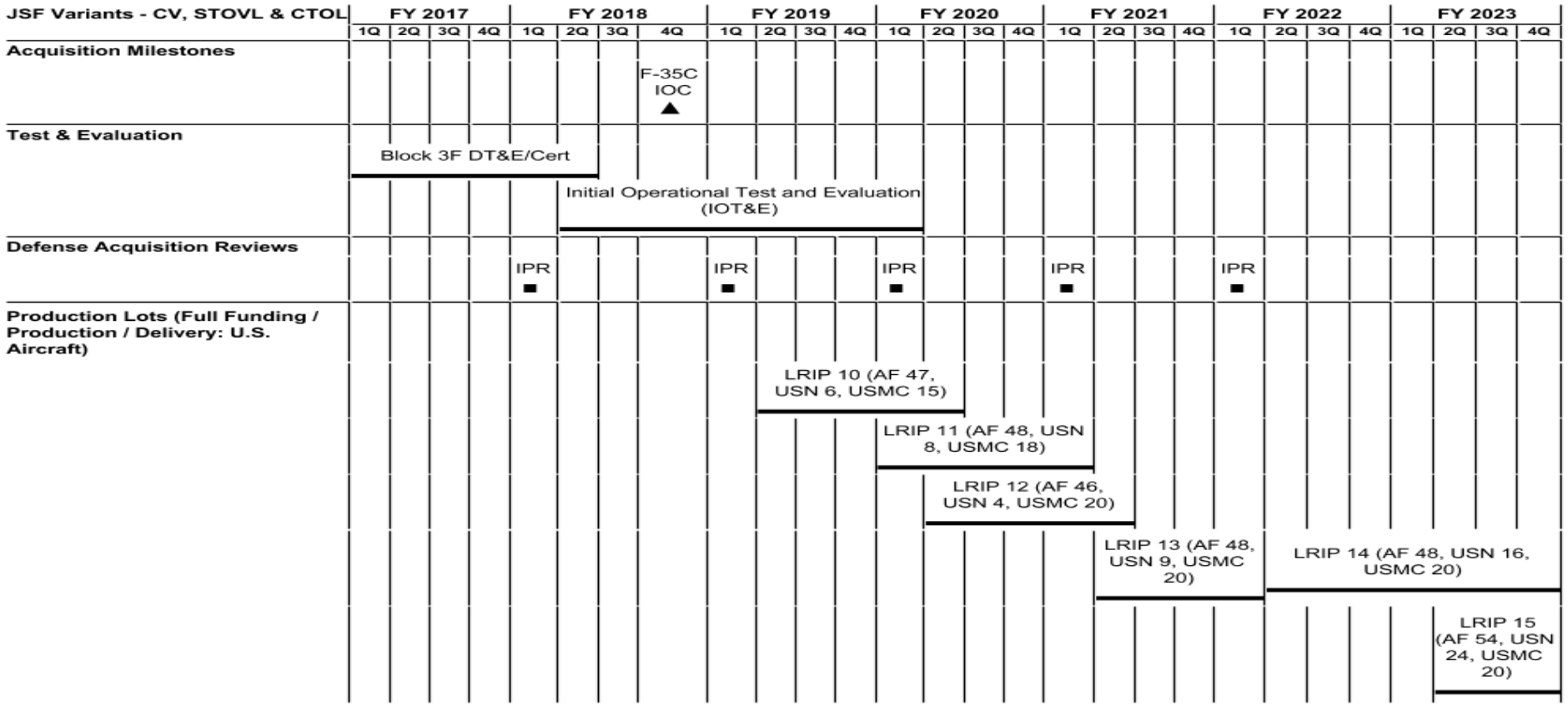
Subtotals and totals may not add due to rounding.

NOTE 1: Prior Years reflect $21,601.831M USAF/$19,311.879M USN/$3,166.810M USMC /$4,964.013 International/Total $49,044.533M
FY 2017 reflects $386.941M USAF/$489.144M USN/$495.958M USMC/$22.000M International/Total $1,394.043M
FY 2018 reflects $255.745M USAF/$103.144M USN/$141.534M USMC/$27.450M International/Total $ 527.873M
FY 2019 reflects $ 69.519M USAF/$ 60.537M USN/$ 66.566M USMC/$ 0.000M International/Total $ 196.622M

JSF EMD Includes:
USAF PE 0604800F BPAC 653831
USN PE 0604800N Project Unit 2261
USMC PE 0604800M Project Unit 2262

D&S Includes:
USAF PE 0604800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*



2019PB - 0604800N - 2261

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JSF Variants - CV, STOVL & CTOL				
Acquisition Milestones: F-35C Initial Operational Capability	4	2018	4	2018
Test & Evaluation: Test and Evaluation: Block 3F DT&E/Cert	1	2017	2	2018
Test & Evaluation: Test and Evaluation: Initial Operational Test and Evaluation (IOT&E)	2	2018	1	2020
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-17	1	2018	1	2018
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-18	1	2019	1	2019
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-19	1	2020	1	2020
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-20	1	2021	1	2021
Defense Acquisition Reviews: System Development Reviews: Interim Program Review (IPR) FY-21	1	2022	1	2022
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 10 Full Funding / Production / Delivery	2	2019	2	2020
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 11 Full Funding / Production / Delivery	1	2020	1	2021
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 12 Full Funding / Production / Delivery	2	2020	2	2021
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 13 Full Funding / Production / Delivery	2	2021	1	2022
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 14 Full Funding / Production / Delivery	2	2022	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 2261 / *Joint Strike Fighter EMD*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Lots (Full Funding / Production / Delivery: U.S. Aircraft): LRIP 15 Full Funding / Production / Delivery	2	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800N / *JT Strike Fighter (JSF) - EMD*	Project (Number/Name) 3352 / *F-35C Sustainment/Capability Enhancements*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3352: *F-35C Sustainment/ Capability Enhancements*	338.445	23.518	5.787	4.957	-	4.957	0.000	0.000	0.000	0.000	0.000	372.707
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 198

Note

Total cost including United States Navy (USN), United States Marine Corps (USMC), United States Air Force (USAF) and International Partner contributions funding is: FY17 $125.862M, FY18 $61.270M and FY19 $ 4.957M.

R-2A table shown above reflect service funding only.

R-2A (section B)/R-3 displays total combined program (i.e. not Service-specific), including International partners.

D&S Includes:
USAF PE 64800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

A. Mission Description and Budget Item Justification

Funds enhancements to the deployability and suitability of the air system such as low observable (LO) maintenance enhancements, security architecture updates, redesign of obsolete items, and integrated training simulators. These enhancements will provide vital on-demand support to the war-fighter within a deployed environment and are not funded via the existing System Development and Demonstration (SDD) program or tied to Block 4 Operational Flight Program development. Funding will result in achieving targeted suitability, maintainability, and affordability returns employing the F-35 in deployed or austere locations.

-Funding at the accomplishment/planned program level is reported as the total of all services as these activities support all aircraft variants. By agreement, USN and USMC funding shares are approximately equal and when combined are equal to the USAF share.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Sustainment and Capability Enhancements	75.280	26.030	4.957	0.000	4.957
Articles:	-	-	-	-	-
Description: Apply disciplined systems engineering, refinement of requirements, develop and acquire					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
suitability and maintainability of the air system such as decentralized maintenance capabilities, LO maintenance enhancements, security architecture updates, redesign of obsolete items and integrated training simulators. ***FY 2018 Plans:*** Continue to conduct systems engineering, technical maturation, integration and test planning for suitability and deployability enhancements. Continue to perform sustaining engineering, development and test activities necessary to gain capacity, compatibility, and expansion in wiring, power, wing conduits, etc. in support of electronic warfare. This includes funding for suitability enhancements such as Standard Operating Unit Version 2 and Band 2/5 efforts. ***FY 2019 Base Plans:*** Continue to conduct systems engineering, technical maturation, integration and test planning for suitability and deployability enhancements. Continue to perform sustaining engineering, development and test activities necessary to gain capacity, compatibility, and expansion in wiring, power, wing conduits, etc. in support of electronic warfare. This includes funding for suitability enhancements related to Distributed Mission Training (DMT). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 Sustainment/Capability Enhancements funding decrease is due to reduction in domestic and International controls in cojunction with SDD phase drawing to closure.					
Title: Development Support	3.556	1.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: SDD support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. ***FY 2018 Plans:*** Complete SDD support efforts for airframe, air vehicle systems, mission systems, weapons integration, mission support, and autonomic logistics development activities. Development Support decrease is due to across the board reduction between both services. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 Sustainment/Capability Enhancements funding decrease is due to reduction in domestic and International controls in cojunction with SDD phase drawing to closure.					
Title: Development Test and Evaluation ***Articles:*** ***Description:*** Verification and testing for deployability and suitability enhancements. ***FY 2018 Plans:*** Complete to initiate government test and evaluaton of capability enhancements for Deployable Autonomic Logistics Information System, and LO maintenance enhancements. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 Sustainment/Capability Enhancements funding decrease is due to reduction in domestic and International controls in cojunction with SDD phase drawing to closure.	1.440 -	0.500 -	0.000 -	0.000 -	0.000 -
Title: Autonomic Logistics Information System ***Articles:*** ***Description:*** SDD execution of Autonomic Logistics Information System (ALIS) develops the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2018 Plans:***	45.586 -	33.740 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete SDD execution of Autonomic Logistics Information System (ALIS) develops the information infrastructure used to transmit health and maintenance action information for the aircraft to the appropriate users. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 Sustainment/Capability Enhancements funding decrease is due to reduction in domestic and International controls in cojunction with SDD phase drawing to closure.					
Accomplishments/Planned Programs Subtotals	125.862	61.270	4.957	0.000	4.957
Joint Strike Fighter 0604800M 3350	23.435	11.400	-	-	-
International Partner	31.947	6.881	-	-	-
Joint Strike Fighter 0604800F	46.962	37.202	-	-	-
Navy Subtotals	23.518	5.787	4.957	0.000	4.957

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E/0604800F: *F-35A Joint Strike Fighter SDD*	386.941	255.745	69.519	-	69.519	7.793	5.596	0.000	0.000	0.000	22,245.963
• International: *International Partner (SDD)*	22.000	27.450	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5,013.463
• APAF/0207142F BP10: *F-35A USAF CTOL*	4,667.894	4,544.684	4,253.696	-	4,253.696	4,209.813	4,862.684	4,796.042	0.000	148,685.767	202,884.710
• RDT&E/0604800M/2262: *F-35B JT Strike Fighter (JSF) - EMD*	495.958	141.534	55.566	-	55.566	1.713	0.542	0.558	0.569	0.000	49,740.973
• APN/0605B: *F-35B Joint Strike Fighter STOVL Spares*	123.252	105.671	92.198	-	92.198	160.150	140.989	143.809	0.000	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0605C: *F-35 Joint Strike Fighter CV Spares*	26.076	84.591	44.971	-	44.971	52.858	303.608	309.680	0.000	Continuing	Continuing
• MILCON 0207142F: *USAF MILCON Operations*	305.700	181.250	175.150	-	175.150	154.400	0.000	0.000	0.000	0.000	1,602.550
• APAF/0207142F BP11: *USAF Modification Funding*	115.811	68.270	230.448	-	230.448	279.814	259.978	301.899	0.000	0.000	1,665.794
• FOD/0207142F: *USAF Follow-on Development (FoD)*	50.970	299.408	396.821	-	396.821	504.971	418.988	343.147	283.292	Continuing	Continuing
• 0207142F/USAF BP16: *USAF Joint Strike Fighter Initial Spares*	362.792	320.831	319.151	-	319.151	416.722	399.361	394.654	0.000	4,175.007	7,849.413
• USAF/OPAF 0207142F: *USAF OPAF*	2.333	3.326	3.310	-	3.310	2.993	2.463	2.507	0.000	Continuing	Continuing
• APN/0592: *F-35B STOVL Series*	24.350	34.963	36.618	-	36.618	38.582	47.609	50.163	53.742	Continuing	Continuing
• APN/0593: *F-35C CV Series*	21.733	31.689	21.236	-	21.236	13.136	12.435	12.683	12.938	Continuing	Continuing
• RDT&E/0604800M/3350: *F-35B Sustainment/ Capability Enhancements*	23.435	11.400	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	373.280
• USAF SDD BP 653832: *Deployability and Suitability Enhancements*	46.962	37.202	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	238.599
• PAF/0207142F BP10: *F-35A CTOL Advance Procurement*	404.500	780.300	405.200	-	405.200	1,003.600	965.300	414.700	0.000	20,154.954	26,885.296
• DCA/0207142F 676011: *Dual Capable Aircraft (DCA)*	25.743	35.122	78.016	-	78.016	92.026	95.040	37.599	11.725	Continuing	Continuing
• APN/0147: *F-35C Joint Strike Fighter CV*	1,360.880	663.232	1,341.369	-	1,341.369	1,938.799	2,793.290	2,963.544	2,973.130	26,243.243	54,674.071
• APN/0152C: *F-35B Joint Strike Fighter STOVL AP*	233.648	413.450	228.492	-	228.492	215.704	209.222	225.245	229.749	1,651.860	4,696.946
• APN/0152: *F-35B Joint Strike Fighter STOVL*	2,504.927	2,631.787	2,635.111	-	2,635.111	2,700.264	2,658.313	2,666.245	2,851.920	20,419.570	47,203.890
• DoN MILCON: *DoN JSF MILCON*	230.900	64.660	121.990	-	121.990	119.800	0.000	0.000	0.000	642.400	1,406.074

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• International 2: *International Procduction/Reprogramming Lab*	185.641	124.114	151.776	-	151.776	150.588	149.848	87.119	0.000	Continuing	Continuing
• OPN/4268: *Logistics Information System (ALIS)*	29.528	63.277	39.374	-	39.374	51.957	55.434	70.046	71.314	Continuing	Continuing
• MC/0207597F: *USAF MILCON Training*	20.000	70.350	11.000	-	11.000	0.000	0.000	0.000	0.000	0.000	166.750
• International 3: *International FoM/D&S*	84.602	158.273	159.649	-	159.649	162.023	167.383	160.111	0.000	Continuing	Continuing
• OPN 902010 S8JC: *Aviation Support Equipment (ALIS)*	0.881	2.297	2.321	-	2.321	0.139	1.977	0.000	0.000	Continuing	Continuing
• USAF O&M: *USAF O&M*	425.978	516.569	731.134	-	731.134	909.930	985.790	1,089.394	0.000	Continuing	Continuing
• USAF MILCON 0502635F: *USAF MILCON Air National Guard*	15.100	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.100
• USN 2936: *F-35C Follow-on Development (CV)*	63.387	139.942	224.712	-	224.712	228.707	188.678	120.192	0.000	Continuing	Continuing
• International Unique: *Imtl Unique (SDD/PSFD)*	32.374	15.566	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	481.617

Remarks

D. Acquisition Strategy

Implement Joint Strike Fighter Joint Executive Steering Board/Configuration Steering Board approved enhancements through existing contracts using the engineering change proposal process. When appropriate, new cost type contracts may be established.

E. Performance Metrics

The following are the key performance parameters from the F-35 Selected Acquisition Report:

Performance Metrics reflect Key Program Performance data.

Combat Radius
F-35A Meets/Exceeds Tripwire Requirement
F-35B Meets/Exceeds Tripwire Requirement
F-35C Meets/Exceeds Tripwire Requirement

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*

F-35B Performance
Flat Deck (High-High-High Profile Fuel) Meets Requirement In Tripwire Band
Ski Jump (High-Medium-Medium-High Profile Fuel) Meets Requirement In Tripwire Band
Vertical Landing Bring Back Meets Requirement In Tripwire Band

F-35C Recovery
Maximum Approach Speed Meets Requirement In Tripwire Band

Interoperability
Net Ready Criteria- Meets Requirement In Tripwire Band

Radio Frequency Signature Meets/Exceeds Tripwire Requirement

Force Protection
CB Pilot Protection (New Key Performance Parameters Per CN3) - Meets/Exceeds Tripwire Requirement

Mission Reliability
F-35A Meets/Exceeds Tripwire Requirement
F-35B United States Marine Corps (USMC) Meets/Exceeds Tripwire Requirement
F-35B United Kingdom (UK) Meets/Exceeds Tripwire Requirement
F-35C Exceeds Operational Requiremets Document Objective

Sortie Generation Rate
F-35A Meets/Exceeds Tripwire Requirement
F-35B USMC Meets/Exceeds Tripwire Requirement
F-35B UK Meets/Exceeds Tripwire Requirement
F-35C Meets/Exceeds Tripwire Requirement

Logistics Footprints
F-35A Meets/Exceeds Tripwire Requirement
F-35B USMC Meets/Exceeds Tripwire Requirement

Logistics Footprint- Volume
F-35B USMC Exceeds ORD Objective

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*

F-35B UK Meets/Exceeds Tripwire Requirement
F-35C Exceeds Operational Requirements Document (ORD) Objective

Logistics Footprint-Weight
F-35B USMC Exceeds ORD Objective
F-35B UK Meets/Exceeds Tripwire Requirement
F-35C Exceeds ORD Objective

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development - 3002 SDD	C/CPFF	Lockheed Martin : Fort Worth, TX	44.233	45.572	Mar 2017	23.655	Mar 2018	4.957	Mar 2019	-		4.957	0.000	118.417	116.732
Primary Hardware Development - 3002 ALIS	C/CPFF	Lockheed Martin : Fort Worth, TX	144.378	40.768	Mar 2017	33.740	Mar 2018	0.000		-		0.000	0.000	218.886	218.886
Primary Hardware Development -14-C-002 Band 2/5	C/CPFF	Lockheed Martin : Fort Worth, TX	98.639	34.526	Mar 2017	2.375	Mar 2018	0.000		-		0.000	0.000	135.540	135.540
		Subtotal	287.250	120.866		59.770		4.957		-		4.957	0.000	472.843	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	AFLCMC : Eglin AFB	33.501	0.000		0.000		0.000		-		0.000	0.000	33.501	-
Development Support	Various	Various : Various	12.368	2.410	Mar 2017	1.000	Mar 2018	0.000		-		0.000	0.000	15.778	-
		Subtotal	45.869	2.410		1.000		0.000		-		0.000	0.000	49.279	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	Various : Various	2.010	0.976	Mar 2017	0.500	Mar 2018	0.000		-		0.000	0.000	3.486	-
		Subtotal	2.010	0.976		0.500		0.000		-		0.000	0.000	3.486	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Support	Various	Various : Various	3.316	1.610	Mar 2017	0.000		0.000		-		0.000	0.000	4.926	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604800N / *JT Strike Fighter (JSF) - EMD*	Project (Number/Name) 3352 / *F-35C Sustainment/Capability Enhancements*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			3.316	1.610		0.000		0.000		-		0.000	0.000	4.926	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	338.445	125.862		61.270		4.957		-		4.957	0.000	530.534	N/A
Joint Strike Fighter 0604800M 3350	-	23.435		11.400		-		-		-			-
International Partner	-	31.947		6.881		-		-		-			-
Joint Strike Fighter 0604800F	-	46.962		37.202		-		-		-			-
Project Cost Totals	338.445	23.518		5.787		4.957		-		4.957	0.000	530.534	-

Remarks

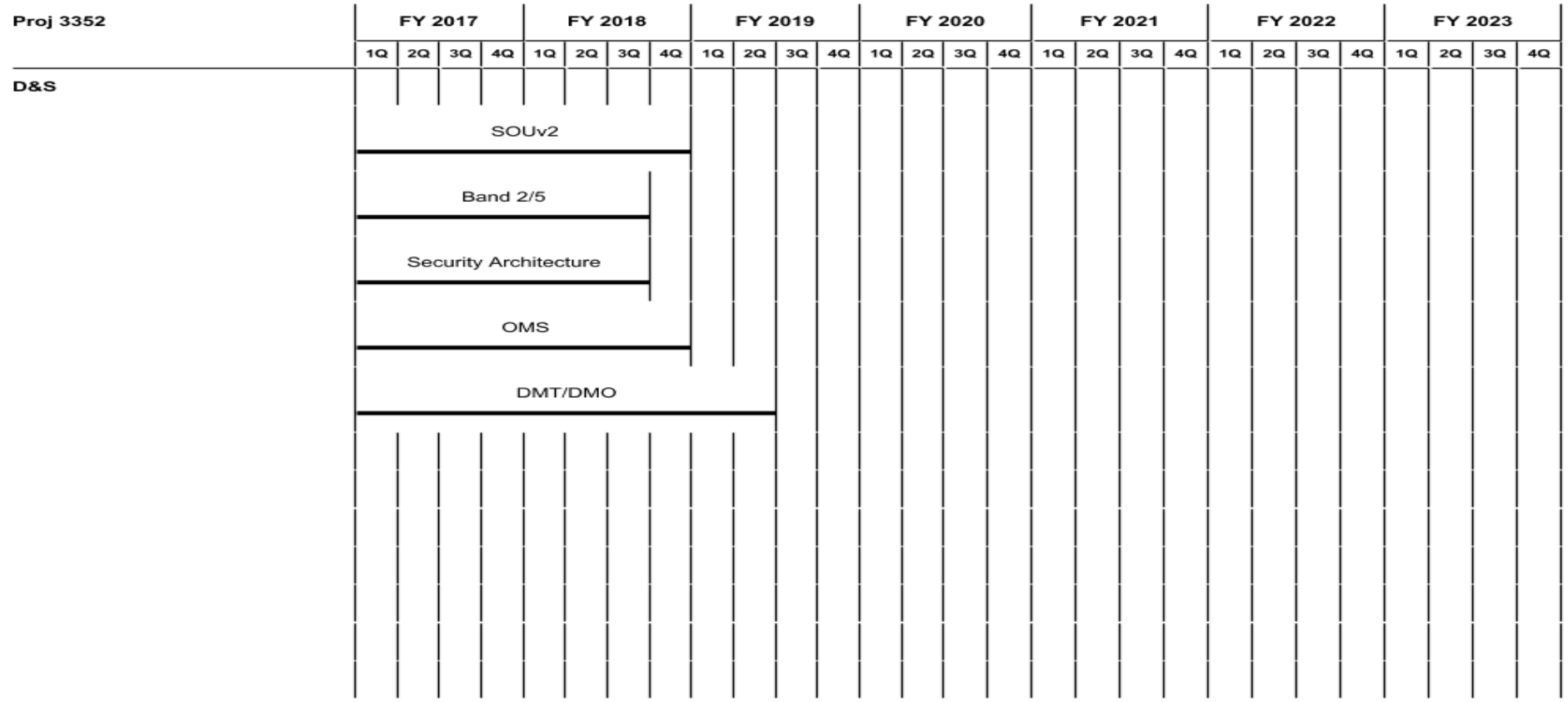
NOTE: Prior Years reflect $154.435M USAF/$68.518M USN/$58.740M USMC/$56.752M International/Total $338.445M
FY 2017 reflects $46.962M USAF/$23.518M USN/$23.435M USMC/$31.947M International/Total $125.862M
FY 2018 reflects $37.202M USAF/$ 5.787M USN/$11.400M USMC/$ 6.881M International/Total $ 61.270M
FY 2019 reflects $ 0.000M USAF/$ 4.957M USN/$ 0.000M USMC/$ 0.000M International/Total $ 4.957M

R-2A (section B)/R-3 displays total combined program (i.e. not Service-specific), including International partners.

JSF EMD Includes:
USAF PE 0604800F BPAC 653831
USN PE 0604800N Project Unit 2261
USMC PE 0604800M Project Unit 2262

D&S Includes:
USAF PE 0604800F BPAC 653832
USN PE 0604800N Project Unit 3352
USMC PE 0604800M Project Unit 3350

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*



2019DON - 0604800N - 3352

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604800N / *JT Strike Fighter (JSF) - EMD*	**Project (Number/Name)** 3352 / *F-35C Sustainment/Capability Enhancements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3352				
D&S: Standard Operating Unit (SOUv2)	1	2017	4	2018
D&S: Band 2/5	1	2017	3	2018
D&S: Security Architecture	1	2017	3	2018
D&S: Offboard Misson Support (OMS) Redesign	1	2017	4	2018
D&S: Distributed Mission Training/Distributed Mission Operations (DMT/DMO)	1	2017	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604810M *I (U)Joint Strike Fighter Follow On Mod (FoM) - MC*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	183.889	29.691	144.958	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	358.538
2935: *JSF Follow On Modernization - Marine Corps*	183.889	29.691	144.958	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	358.538
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 198												

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the United States Navy, United States Air Force, United States Marine Corps and International Partners countries. There are three variants the F-35A Conventional Takeoff and Landing variant; F-35B Short Take Off and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. Maximum commonality among the variants, consistent with National Disclosure Policy, will minimize total air system life cycle costs. Planning and pre-development systems engineering for the Block 4 continues as Initial Operational Capability (IOC) is met for each variant during System Development and Demonstration (SDD).

The JSF Continuous Capability Development and Delivery (C2D2) efforts provide incremental warfighting capability improvements to maintain joint air dominance against evolving threats. C2D2 capability requirements were initiated through ongoing Service-led operational analysis of warfighting gaps identified in the Fifth Generation Fighter Modernization Initial Capabilities Document (ICD), and through F-35 JSF Block 4 Mission Decomposition analysis completed in FY2014. These analyses serve as the basis for the F-35 Block 4 Capabilities Development Document (CDD), staffed through the Air Force Requirements Oversight Council (AFROC) and signed by the USAF Chief of Staff in January 2015. Joint Requirements Oversight Council (JROC) approved the CDD 21 March 2017. Modernization activities in FY2017 and FY2018 include systems engineering, risk reduction, and infrastructure upgrades required to deliver full Air System capabilities to support initial fleet availability of Block 4 upgrades in FY2021.

C2D2 efforts designated as Block 4 include a robust weapons integration portfolio and provide new opportunities for International Partners to assess, integrate, and field unique capabilities based on global sovereign requirements.

The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark and Norway are participants in F-35 modernization. The program shown here reflects United States Marine Corps funding. Total funding for all Service and International Partners is reported at the accomplishment/planned program level since activities support all aircraft variants. Foreign Military Sales are ongoing separately.

PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604810M *I (U)Joint Strike Fighter Follow On Mod (FoM) - MC*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	74.227	144.958	226.310	-	226.310
Current President's Budget	29.691	144.958	0.000	-	0.000
Total Adjustments	-44.536	0.000	-226.310	-	-226.310
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-226.310	-	-226.310
• Congressional Directed Reductions Adjustments	-44.536	-	-	-	-

Change Summary Explanation

Adjusted R-4 schedule as follows:
Contracting: Removed Modernization RFP decision to reflect current strategy.
Changed Block 4 Phase II contract award to 2QFY18 to reflect current plan.
Added 4.2 Systems Requirment Review (SRR) in 4QFY19.
Changed contract naming conventions Pre-modernization-Modernization to Phase I and Phase II.

Program Changes:
FY2017 -$44.536M adjustment in FY17 is due to Congressional Reduction.
FY2019 -$225.442 adjustmnet in FY19 due to change in budget from BA05 to BA 07. PE 060480M/N begins in FY19.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	Project (Number/Name) 2935 / *JSF Follow On Modernization - Marine Corps*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2935: *JSF Follow On Modernization - Marine Corps*	183.889	29.691	144.958	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	358.538
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 198

Note

Total cost, including International partner contributions, USN, USMC, and USAF funding: FY2017 $167.902M; FY2018 $738.389M; FY2019 continues in PE 0604840M/N as budget moves from BA05 to BA07.

R-2A table shown above reflects service funding only.

R-2A (section B)/R-3 displays combined program for JSF Continuous Capability Development and Delivery (C2D2).

JSF C2D2 Includes:
USAF PE 0207142F BPAC 675346
USN PE 0604810N Project Unit 2936
USMC PE 0604810M Project Unit 2935
USN PE 0604800N Project Unit 9999 (FY14): $1.500M
USMC PE 0604800M Project Unit 9999 (FY14): $1.500M
International Partner Contributions

A. Mission Description and Budget Item Justification

F-35 C2D2 provides continuing incremental upgrades of the three F-35 variants and associated ground equipment. Upgrades are essential capabilities for Air Interdiction and Strategic Attack, Close Air Support, Suppression and Destruction of Enemy Air Defenses, Offensive and Defensive Counter Air and expanded Surface Warfare. The C2D2 acquisition strategy is based upon incremental deliveries of capabilities. The strategy includes periodic deliveries with a focus on hardware, tech refresh and softwre. C2D2 capability planning includes an efficient transition from F-35 SDD to C2D2. As SDD development activities ramp down C2D2 will assume responsibility for improvements and modernization efforts.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development - Block 4 Planning and Systems Engineering	36.716	314.240	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	**Project (Number/Name)** 2935 / *JSF Follow On Modernization - Marine Corps*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Block 4 Planning and Systems Engineering preliminarily design and delta System Requirements Review (SRR) for all variants of the F-35 Aircraft. Modernization efforts is the Requirements Decomposition of capabilities for the entire Block 4 upgrade to include sub-blocks 4.1 and 4.2. This is a continuation of the previous Block 4 Requirements Decomposition effort which will include activities leading up to a successful System Functional Review (SFR) and select facility upgrades required for Block 4 research, development, test and evaluation. Included in Block 4 are upgraded capabilities and continuous improvements to maintain Air System viability against evolving threats indicated in the Electronic Warfare Initial Capabilities Document (ICD), the Fifth Generation Fighter Modernization ICD, and the Block 4 Capability Development Document (CDD), reduce life cycle cost, and improve operational suitability. Expected completion of a Block 4.1 Preliminary Design Review (PDR) and a Block 4.2 System Requirements Review (SRR) will address additional Block 4 capabilities requirements. Post-PDR risk reduction, preplanning for subsequent Block 4 Modernization events, and investments to deliver the full Block 4 Air System capabilities are included. ***FY 2018 Plans:*** Conduct a Block 4.1 System Functional Review (SFR). Award Phase II contract for Block 4.1 PDR, Block 4.2 SRR , and Post-PDR risk reduction and Planning. Continuing development and maturity of key long lead capabilities and service unique weapons. ***FY 2019 Base Plans:*** FY19 effort continues in PE 0604840M/N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.					
Title: Product Development - Technology Refresh 3 (TR-3)	77.177	96.025	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Technology Refresh 3 (TR-3) Design Competition, Development, Integration, and Test. This is the design phase of TR-3 program fully supports Block 3F functionality and allows incorporation of all Block 4 capabilities documented in the System Requirements Document (SRD). TR-3 hardware redesign is required to support 4X processing growth factor based on the current processing estimates for all 3F capabilities. Redesign of TR-3 subsystems (Integrated Core Processor (ICP), Aircraft Memory System (AMS), and Panoramic Cockpit					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	**Project (Number/Name)** 2935 / *JSF Follow On Modernization - Marine Corps*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Display (PCD)) configurations will contain new backplane technology, commercial operating systems, and modified middleware necessary to take the design of the TR-3 System through Critical Design Review (CDR). ***FY 2018 Plans:*** The TR-3 program will continue design toward Critical Design Review of the Integrated Core Processor (ICP), Panoramic Cockpit Display (PCD), and Aircraft Memory System (AMS). In addition the TR-3 program will prototype the middleware software that will enable F-35's new messaging architecture delivered as part of TR-3 and ensure compatibility with current F-35 sensors. Additionally the initial lab stand up will occur to ensure timely first article delivery to the production line in FY23. ***FY 2019 Base Plans:*** FY19 effort continues in PE 0604840M/N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.					
Title: Infrastructure and Support Costs	52.009	132.026	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Funding will support infrastructure investment planning and other test planning activities required for Block 4 development, integration, test and evaluation. Funding related to the Integrated Test Force, government, and contractor labor. Other costs in support of ranges, chase planes and DT site operations. ***FY 2018 Plans:*** Continue development support for defining, managing and acquiring the F-35 capability enhancements identified in approved requirements documents. Transfer of integrated test force requirement to C2D2 as F-35 SDD draws to closure. ***FY 2019 Base Plans:*** FY19 effort continues in PE 0604840M/N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	**Project (Number/Name)** 2935 / *JSF Follow On Modernization - Marine Corps*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.					
Title: Test and Evaluation	2.000	196.098	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Non-recurring engineering required to plan for the service life extension of existing DT aircraft and modification necessary to bring DT aircraft fleet to a common configuration. Additional upgrades required to support development and evaluation of improvements driven by changes in the threat environment and as identified in the Electronic Warfare ICD, the Fifth Generation Fighter Modernization ICS, and the Block 4 Capability Development Document (CDD). Execution of all DT activities in support of Block 4. ***FY 2018 Plans:*** Funding will support investment planning and prioritization required to maintain future development capability. This funding supports the non-recurring engineering (NRE) for capability upgrades and service life extension modifications to include engine, structural and mission systems updates to maintain the viability of DT fleet for C2D2 efforts. This funding also supports laboratory upgrades required to support development and verification of capabilities in a relevant environment. ***FY 2019 Base Plans:*** FY19 effort continues in PE 0604840M/N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.					
Accomplishments/Planned Programs Subtotals	167.902	738.389	0.000	0.000	0.000
0604810N JSF Continuous Capability Development and Delivery	25.041	143.855	-	-	-
International Continuous Capability Development and Delivery	65.008	150.168	-	-	-
0207142F JSF Continuous Capability Development and Delivery	48.162	299.408	-	-	-
Navy Subtotals	29.691	144.958	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	Project (Number/Name) 2935 / *JSF Follow On Modernization - Marine Corps*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E/0604810N/2936: *F-35C Follow On Modernization - Navy*	25.041	143.855	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	352.785
• USAF/FOD/0207142F: *USAF Continuous Capability Development and Delivery*	48.162	299.408	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	394.593
• International: *International Continuous Capability Development and Delivery*	84.602	158.273	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	316.896

Remarks

This is a joint program with no executive service. Service Acquisition Executive (SAE) authority alternates between the Department of the Navy and the Department of the Air Force and currently resides with the Air Force. Program Element 0604800N/0604800M continues USN development efforts budgeted in 0603800N prior to FY2002. The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark, and Norway are participants in the SDD phase of JSF.

PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.

D. Acquisition Strategy

The C2D2 acquisition strategy is to employ both Cost and Fixed Price Incentive contracts for the Block 4 engineering and development efforts. A new modernization contract structure will be established for all post SDD Block 4 efforts. In addition, a separate Basic Ordering Agreement or Indefinite Quantity/Indefinite Delivery contract is planned to provide a long term approach to upgrading and maintaining laboratories and test aircraft and supporting technology maturation for future C2D2 capabilities.

E. Performance Metrics

Overall Block 4 Performance Metrics will reflect Key Performance Parameters established in the F-35 Block 4 Capability Development Document.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	**Project (Number/Name)** 2935 / *JSF Follow On Modernization - Marine Corps*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prime LM TBD (Phase II)	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	28.140	Feb 2018	276.520	Feb 2018	0.000		-		0.000	0.000	304.660	304.660
Prime LM 14-G-0020 (TR3)	C/CPFF	Lockheed Martin : FT. Worth, TX	19.660	77.177	Mar 2017	96.025	Feb 2018	0.000		-		0.000	0.000	192.862	192.862
Prime LM BOA 0020 (Nimble Lightning + Pilot Training)	C/CPFF	Lockheed Martin : FT Worth, TX	1.206	3.500	Sep 2017	4.250	Mar 2018	0.000		-		0.000	0.000	8.956	8.956
Prime Flight Test Assets	Various	Various : Various	0.000	0.000		37.548	Mar 2018	0.000		-		0.000	0.000	37.548	37.548
Prime LM ECASE	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000		15.670	Feb 2018	0.000		-		0.000	0.000	15.670	15.670
Prime LM TBD DT AC Viability	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000	Sep 2017	65.205	Feb 2018	0.000		-		0.000	0.000	65.205	65.205
Systems Engineering	C/CPFF	Various : Various	0.266	5.076	Dec 2016	17.800	Feb 2018	0.000		-		0.000	0.000	23.142	23.142
Prior Year No Longer Funded in FYDP	Various	Various : Various	144.540	0.000		0.000		0.000		-		0.000	0.000	144.540	144.540
		Subtotal	165.672	113.893		513.018		0.000		-		0.000	0.000	792.583	N/A

Remarks

Block 4 Modernization R-2A includes Phase II, Nimble Lightning, ECASE & Systems Engineering.
Added Prior Year No Longer Funded in FYDP line in Product Development section.
Added Prime LM Phase 0 & Phase I Prior Year amounts to Prior Year No Longer Funded in FYDP line .
Deleted Phase O, Phase I and Block 4 Modernization lines.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NAWCAD : Patuxent River, MD	7.903	8.195	Dec 2016	15.750	Dec 2017	0.000		-		0.000	0.000	31.848	Continuing
Development Support	WR	NAWCWD : China Lake, CA	0.429	0.600	Dec 2016	8.150	Dec 2017	0.000		-		0.000	0.000	9.179	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	Project (Number/Name) 2935 / *JSF Follow On Modernization - Marine Corps*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	Edwards AFB : Edwards AFB, CA	0.986	0.000		3.802	Dec 2017	0.000		-		0.000	0.000	4.788	-
Development Support	Various	Eglin : Various	0.015	2.250	Dec 2016	3.450	Jan 2018	0.000		-		0.000	0.000	5.715	-
Development Support	Various	Various : Various	7.903	8.682	Dec 2016	8.852	Dec 2017	0.000		-		0.000	0.000	25.437	-
Development Support	MIPR	AFLCMC : Wrigth Patterson AFB	0.281	1.005	Dec 2016	1.125	Dec 2017	0.000		-		0.000	0.000	2.411	-
		Subtotal	17.517	20.732		41.129		0.000		-		0.000	0.000	79.378	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	0.000		34.995	Feb 2018	0.000		-		0.000	0.000	34.995	-
Developmental Test & Evaluation	WR	NAWCWD : China Lake , CA	0.000	0.000		10.350	Feb 2018	0.000		-		0.000	0.000	10.350	-
Developmental Test & Evaluation Edwards/AFB	Various	Edwards AFB : Edwards AFB, CA	0.000	0.000		25.250	Feb 2018	0.000		-		0.000	0.000	25.250	-
Developmental Test & Evaluation	Various	Various : Various	0.000	0.000		10.250	Feb 2018	0.000		-		0.000	0.000	10.250	-
Developmental Test Aircraft Viability	WR	AFOTECH : Kirtland AFB, NM	0.700	2.000	Feb 2017	12.500	Feb 2018	0.000		-		0.000	0.000	15.200	-
		Subtotal	0.700	2.000		93.345		0.000		-		0.000	0.000	96.045	N/A

Remarks

Increase in Test and Evaluation funding due to transfer of Integrated Test Force (ITF)requirements from SDD to C2D2 budget.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	Project (Number/Name) 2935 / *JSF Follow On Modernization - Marine Corps*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFLCMC Civilian Pay	Various	AFLCMC CIVPAY : Wright Patterson, AFB	0.000	29.377	Oct 2016	44.700	Oct 2017	0.000		-		0.000	0.000	74.077	-
Financial Mgmt Database Support IDS	Various	Various : Various	0.000	0.000		0.800	Jan 2018	0.000		-		0.000	0.000	0.800	-
Earned Value/Finance/ Cost ACT-I	Various	Various : Various	0.000	0.000		4.500	Jan 2018	0.000		-		0.000	0.000	4.500	-
CIO BOS	Various	Various : Various	0.000	0.000		20.000	Jan 2018	0.000		-		0.000	0.000	20.000	-
Systems System High BOS	Various	Various : Various	0.000	0.000		9.336	Jan 2018	0.000		-		0.000	0.000	9.336	-
Other CIO Services	Various	Various : Various	0.000	0.000		8.239	Jan 2018	0.000		-		0.000	0.000	8.239	-
Travel	Various	Various : Various	0.000	1.900	Oct 2016	3.322	Oct 2017	0.000		-		0.000	0.000	5.222	-
		Subtotal	0.000	31.277		90.897		0.000		-		0.000	0.000	122.174	N/A

Remarks

Increase in Management Services funding due to transfer of Integrated Test Force (ITF)requirements from SDD to C2D2 budget.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	183.889	167.902		738.389		0.000		-		0.000	0.000	1,090.180	N/A
0604810N JSF Continuous Capability Development and Delivery	-	25.041		143.855		-		-		-			-
International Continuous Capability Development and Delivery	-	65.008		150.168		-		-		-			-
0207142F JSF Continuous Capability Development and Delivery	-	48.162		299.408		-		-		-			-
Project Cost Totals	183.889	29.691		144.958		0.000		-		0.000	0.000	1,090.180	-

Remarks

Subtotals and totals may not add due to rounding.

Prior Year reflects $75.951M USAF/$30.286M USN/$29.726M USMC/$47.926M International/Total $183.889M

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	Project (Number/Name) 2935 / *JSF Follow On Modernization - Marine Corps*	

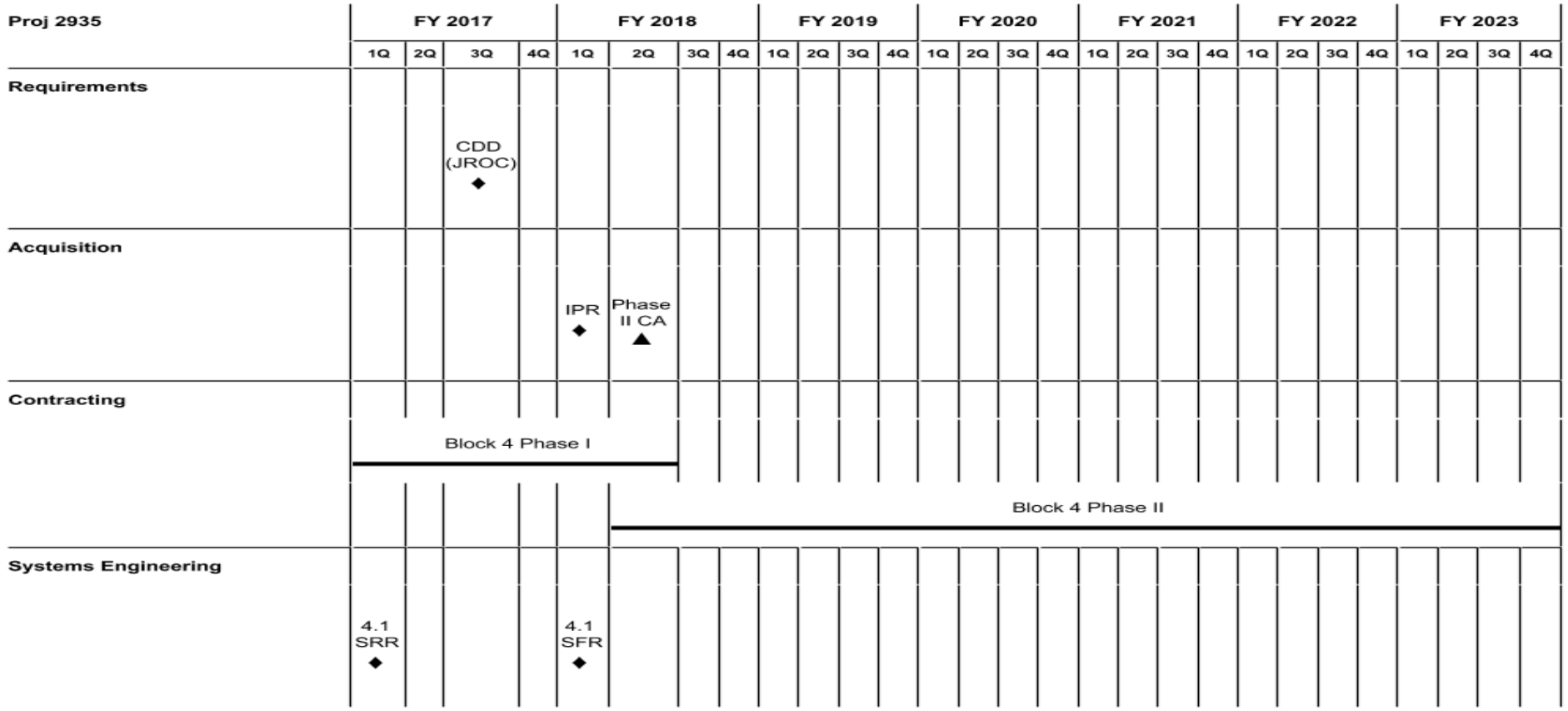
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract

FY 2017 reflects $ 48.162M USAF/$ 25.041M USN/$29.691M USMC/$65.008M International/Total $167.902M
FY 2018 reflects $299.408M USAF/$143.855M USN/$144.958M USMC/$150.168M International/Total $738.389M
FY 2019 continues in PE 0604840M/N as budget moves from BA05 to BA07.

R-2A (section B)/R-3 displays total combined program (i.e. not Service-specific), including International partners.

JSF Continuous Capability Development and Delivery (C2D2) Includes:
USAF PE 0207142F BPAC 675346
USN PE 0604810N Project Unit 2936
USMC PE 0604810M Project Unit 2935
USN PE 0604800N Project Unit 9999 (FY14): $1.500
USMC PE 0604800M Project Unit 999 (FY14) : $1.500

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	**Project (Number/Name)** 2935 / *JSF Follow On Modernization - Marine Corps*



2019PB - 0604810M - 2935

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810M / *(U)Joint Strike Fighter Follow On Mod (FoM) - MC*	**Project (Number/Name)** 2935 / *JSF Follow On Modernization - Marine Corps*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2935				
Requirements: Final CDD (JROC)	3	2017	3	2017
Acquisition: Block 4 Phase II Contract Award	2	2018	2	2018
Acquisition: Interim Program Review (IPR) FY18	1	2018	1	2018
Contracting: Block 4 Phase I	1	2017	2	2018
Contracting: Block 4 Phase II	2	2018	4	2023
Systems Engineering: 4.1 System Requirements Review (SRR)	1	2017	1	2017
Systems Engineering: 4.1 System Functional Review (SFR)	1	2018	1	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604810N *I (U)Joint Strike Fighter Follow On Mod (FoM) - Navy*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	183.889	25.041	143.855	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	352.785
2936: *F-35C C2D2*	183.889	25.041	143.855	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	352.785

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 198

A. Mission Description and Budget Item Justification

The F-35 Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike aircraft for the United States Navy, United States Air Force, United States Marine Corps and International Partners countries. There are three variants the F-35A Conventional Takeoff and Landing variant; F-35B Short Take Off and Vertical Landing; and the F-35C Aircraft Carrier suitable variant. Maximum commonality among the variants, consistent with National Disclosure Policy, will minimize total air system life cycle costs. Planning and pre-development systems engineering for the Block 4 continues as Initial Operational Capability (IOC) is met for each variant during System Development and Demonstration (SDD).

The JSF Continuous Capability Development and Delivery (C2D2) efforts provide incremental warfighting capability improvements to maintain joint air dominance against evolving threats. C2D2 capability requirements were initiated through ongoing Service-led operational analysis of warfighting gaps identified in the Fifth Generation Fighter Modernization Initial Capabilities Document (ICD), and through F-35 JSF Block 4 Mission Decomposition analysis completed in FY2014. These analyses serve as the basis for the F-35 Block 4 Capabilities Development Document (CDD), staffed through the Air Force Requirements Oversight Council (AFROC) and signed by the USAF Chief of Staff in January 2015. Joint Requirements Oversight Council (JROC) approved the CDD 21 March 2017. Modernization activities in FY2017 and FY2018 include systems engineering, risk reduction, and infrastructure upgrades required to deliver full Air System capabilities to support initial fleet availability of Block 4 upgrades in FY2021.

C2D2 efforts designated as Block 4 include a robust weapons integration portfolio and provide new opportunities for International Partners to assess, integrate, and field unique capabilities based on global sovereign requirements.

The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark and Norway are participants in F-35 modernization. The program shown here reflects United States Marine Corps funding. Total funding for all Service and International Partners is reported at the accomplishment/planned program level since activities support all aircraft variants. Foreign Military Sales are ongoing separately.

PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604810N *I (U)Joint Strike Fighter Follow On Mod (FoM) - Navy*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	63.387	143.855	225.442	-	225.442
Current President's Budget	25.041	143.855	0.000	-	0.000
Total Adjustments	-38.346	0.000	-225.442	-	-225.442
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.314	0.000			
• Rate/Misc Adjustments	0.000	0.000	-225.442	-	-225.442
• Congressional Directed Reductions Adjustments	-38.032	-	-	-	-

Change Summary Explanation

Adjusted R-4 schedule as follows:
Contracting: Removed Modernization RFP decision to reflect current strategy.
Changed Block 4 Phase II contract award to 2QFY18 to reflect current plan.
Added 4.2 Systems Requirment Review (SRR) in 4QFY19.
Changed contract naming conventions Pre-modernization-Modernization to Phase I and Phase II.

Program Changes:
FY2017 -$38.032M adjustment in FY17 is due to Congressional Reduction.
FY2019 -$225.442 adjustmnet in FY19 due to change in budget from BA05 to BA 07. PE 060480M/N begins in FY19.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	Project (Number/Name) 2936 / *F-35C C2D2*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2936: *F-35C C2D2*	183.889	25.041	143.855	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	352.785
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 198

Note

Total cost, including International partner contributions, USN, USMC, and USAF funding: FY2017 $167.902M; FY2018 $738.389M; FY2019 continues in PE 0604840M/N as budget moves from BA05 to BA07.

R-2A table shown above reflects service funding only.

R-2A (section B)/R-3 displays combined program for JSF Continuous Capability Development and Delivery (C2D2).

JSF C2D2 Includes:
USAF PE 0207142F BPAC 675346
USN PE 0604810N/ Project Unit 2936
USMC PE 0604810M Project Unit 2935
USN PE 0604800N Project Unit 9999 (FY14): $1.500M
USMC PE 0604800M Project Unit 9999 (FY14): $1.500M
International Partner Contributions

A. Mission Description and Budget Item Justification

F-35 C2D2 provides continuing incremental upgrades of the three F-35 variants and associated ground equipment. Upgrades are essential capabilities for Air Interdiction and Strategic Attack, Close Air Support, Suppression and Destruction of Enemy Air Defenses, Offensive and Defensive Counter Air and expanded Surface Warfare. The C2D2 acquisition strategy is based upon incremental deliveries of capabilities. The strategy includes periodic deliveries with a focus on hardware, tech refresh and softwre. C2D2 capability planning includes an efficient transition from F-35 SDD to C2D2. As SDD development activities ramp down C2D2 will assume responsibility for improvements and modernization efforts.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development - Block 4 Planning and Systems Engineering	36.716	314.240	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Block 4 Planning and Systems Engineering preliminarily design and delta System Requirements Review (SRR) for all variants of the F-35 Aircraft. Modernization efforts is the Requirements Decomposition of capabilities for the entire Block 4 upgrade to include sub-blocks 4.1 and 4.2. This is a continuation of the previous Block 4 Requirements Decomposition effort which will include activities leading up to a successful System Functional Review (SFR) and select facility upgrades required for Block 4 research, development, test and evaluation. Included in Block 4 are upgraded capabilities and continuous improvements to maintain Air System viability against evolving threats indicated in the Electronic Warfare Initial Capabilities Document (ICD), the Fifth Generation Fighter Modernization ICD, and the Block 4 Capability Development Document (CDD), reduce life cycle cost, and improve operational suitability. Expected completion of a Block 4.1 Preliminary Design Review (PDR) and a Block 4.2 System Requirements Review (SRR) will address additional Block 4 capabilities requirements. Post-PDR risk reduction, preplanning for subsequent Block 4 Modernization events, and investments to deliver the full Block 4 Air System capabilities are included. ***FY 2018 Plans:*** Conduct a Block 4.1 System Functional Review (SFR). Award Phase II contract for Block 4.1 PDR, Block 4.2 SRR , and Post-PDR risk reduction and Planning. Continuing development and maturity of key long lead capabilities and service unique weapons. ***FY 2019 Base Plans:*** FY19 effort continues in PE 0604840M/N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.					
Title: Product Development - Technology Refresh 3 (TR-3)	77.177	96.025	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Technology Refresh 3 (TR-3) Design Competition, Development, Integration, and Test. This is the design phase of TR-3 program fully supports Block 3F functionality and allows incorporation of all Block 4 capabilities documented in the System Requirements Document (SRD). TR-3 hardware redesign is required to support 4X processing growth factor based on the current processing estimates for all 3F capabilities. Redesign of TR-3 subsystems Integrated Core Processor (ICP), Aircraft Memory System (AMS), and Panoramic Cockpit					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Display (PCD)) configurations will contain new backplane technology, commercial operating systems, and modified middleware necessary to take the design of the TR-3 System through Critical Design Review (CDR). ***FY 2018 Plans:*** The TR-3 program will continue design toward Critical Design Review of the Integrated Core Processor (ICP), Panoramic Cockpit Display (PCD), and Aircraft Memory System (AMS). In addition the TR-3 program will prototype the middleware software that will enable F-35's new messaging architecture delivered as part of TR-3 and ensure compatibility with current F-35 sensors. Additionally the initial lab stand up will occur to ensure timely first article delivery to the production line in FY23. ***FY 2019 Base Plans:*** FY19 effort continues in PE 0604840M/N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.					
Title: Infrastructure and Support Costs	52.009	132.026	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Funding will support infrastructure investment planning and other test planning activities required for Block 4 development, integration, test and evaluation. Funding related to the Integrated Test Force, government, and contractor labor. Other costs in support of ranges, chase planes and DT site operations. ***FY 2018 Plans:*** Continue development support for defining, managing and acquiring the F-35 capability enhancements identified in approved requirements documents. Transfer of integrated test force requirement to C2D2 as F-35 SDD draws to closure. ***FY 2019 Base Plans:*** FY19 effort continues in PE 0604840M/N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.					
Title: Test and Evaluation	2.000	196.098	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Non-recurring engineering required to plan for the service life extension of existing DT aircraft and modification necessary to bring DT aircraft fleet to a common configuration. Additional upgrades required to support development and evaluation of improvements driven by changes in the threat environment and as identified in the Electronic Warfare ICD, the Fifth Generation Fighter Modernization ICS, and the Block 4 Capability Development Document (CDD). Execution of all DT activities in support of Block 4. ***FY 2018 Plans:*** Funding will support investment planning and prioritization required to maintain future development capability. This funding supports the non-recurring engineering (NRE) for capability upgrades and service life extension modifications to include engine, structural and mission systems updates to maintain the viability of DT fleet for C2D2 efforts. This funding also supports laboratory upgrades required to support development and verification of capabilities in a relevant environment. ***FY 2019 Base Plans:*** FY19 effort continues in PE 0604840M/N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** PE 0604810M/N ending in FY18 and continues in PE 0604840M/N as budget moves from BA05 to BA07.					
Accomplishments/Planned Programs Subtotals	167.902	738.389	0.000	0.000	0.000
0604810M JSF Continuous Capability Development and Delivery	29.691	144.958	-	-	-
International Continuous Capability Development and Delivery	65.008	150.168	-	-	-
0207142F JSF Continuous Capability Development and Delivery	48.162	299.408	-	-	-
Navy Subtotals	25.041	143.855	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E/0604810M/2935: *F-35C Follow On Modernization - Marine Corps*	29.691	144.958	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	358.538
• International: *International Continuous Capability Development and Delivery*	84.602	158.273	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• USAF/FOM/0207142F: *USAF Continuous Capability Development and Delivery*	48.162	299.408	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

This is a joint program with no executive service. Service Acquisition Executive (SAE) authority alternates between the Department of the Navy and the Department of the Air Force and currently resides with the Navy. Program Element 0604800N/0604800M continues USN development efforts budgeted in 0603800N prior to FY2002. The United Kingdom, Italy, Netherlands, Turkey, Canada, Australia, Denmark, and Norway are participants in the SDD phase of JSF.

PE 0604810M/N ending in FY18 and continies in PE 0604840M/N as budget moves from BA05 to BA07.

D. Acquisition Strategy

The C2D2 acquisition strategy is to employ both Cost and Fixed Price Incentive contracts for the Block 4 engineering and development efforts. A new modernization contract structure will be established for all post SDD Block 4 efforts. In addition, a separate Basic Ordering Agreement or Indefinite Quantity/Indefinite Delivery contract is planned to provide a long term approach to upgrading and maintaining laboratories and test aircraft and supporting technology maturation for future C2D2 capabilities.

E. Performance Metrics

Overall Block 4 Performance Metrics will reflect Key Performance Parameters established in the F-35 Block 4 Capability Development Document.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prime LM TBD (Phase II)	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	28.140	Feb 2018	276.520	Feb 2018	0.000		-		0.000	0.000	304.660	304.660
Prime LM 14-G-0020(TR3)	C/CPFF	Lockheed Martin : FT Worth, TX	19.660	77.177	Mar 2017	96.025	Feb 2018	0.000		-		0.000	0.000	192.862	768.965
Prime LM BOA 0020 (Nimble Lightning + Pilot Training)	C/CPFF	Lockheed Martin : FT Worth, TX	1.206	3.500	Sep 2017	4.250	Mar 2018	0.000		-		0.000	0.000	8.956	24.676
Prime LM Flight Test Asset	Various	Lockheed Martin : FT Worth, TX	0.000	0.000		37.548	Mar 2018	0.000		-		0.000	0.000	37.548	107.172
Prime LM IDIQ TBD (ECASE)	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000		15.670	Feb 2018	0.000		-		0.000	0.000	15.670	100.000
Prime LM TBD DTAC Viability	C/CPFF	Lockheed Martin : Ft. Worth, TX	0.000	0.000		65.205	Feb 2018	0.000		-		0.000	0.000	65.205	174.000
Systems Engineering	C/CPFF	Various : Various	0.266	5.076	Dec 2016	17.800	Feb 2018	0.000		-		0.000	0.000	23.142	97.646
Prior Year No Longer Funded in FYDP	Various	Various : Various	144.540	0.000		0.000		0.000		-		0.000	0.000	144.540	-
		Subtotal	165.672	113.893		513.018		0.000		-		0.000	0.000	792.583	N/A

Remarks

Block 4 Modernization on R-2A includes Phase II, Nimble Lightning, ECASE & Systems Engineering.
Added Prior Year No Longer Funded in FYDP line in Product Development section.
Added Prime LM Phase 0 & Phase I Prior Year amounts to Prior Year No Longer Funded in FYDP line .
Deleted Phase O, Phase I and Block 4 Modernization lines.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	WR	NAWCAD : Patuxent River, MD	7.903	8.195	Dec 2016	15.750	Dec 2017	0.000		-		0.000	0.000	31.848	Continuing
Development Support	WR	NAWCWD : China Lake, CA	0.429	0.600	Dec 2016	8.150	Dec 2017	0.000		-		0.000	0.000	9.179	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	Edwards AFB : Edwards AFB, CA	0.986	0.000		3.802	Dec 2017	0.000		-		0.000	0.000	4.788	-
Development Support	Various	Eglin : Various	0.015	2.250	Dec 2016	3.450	Jan 2018	0.000		-		0.000	0.000	5.715	-
Development Support	Various	Various : Various	7.903	8.682	Dec 2016	8.852	Dec 2017	0.000		-		0.000	0.000	25.437	-
Development Support	MIPR	AFLCMC : Wright Patterson AFB	0.281	1.005	Dec 2016	1.125	Dec 2017	0.000		-		0.000	0.000	2.411	-
		Subtotal	17.517	20.732		41.129		0.000		-		0.000	0.000	79.378	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	0.000		34.995	Feb 2018	0.000		-		0.000	0.000	34.995	-
Developmental Test & Evaluation	WR	NAWCWD : China Lake , CA	0.000	0.000		10.350	Feb 2018	0.000		-		0.000	0.000	10.350	-
Developmental Test & Evaluation Edwards/AFB	Various	Edwards AFB : Edwards AFB, CA	0.000	0.000		25.250	Feb 2018	0.000		-		0.000	0.000	25.250	-
Developmental Test & Evaluation	Various	Various : Various	0.000	0.000		10.250	Feb 2018	0.000		-		0.000	0.000	10.250	-
Operational Test & Evaluation	WR	AFOTEC : Kirtland AFB, NM	0.700	2.000	Feb 2018	12.500	Feb 2018	0.000		-		0.000	0.000	15.200	255.683
		Subtotal	0.700	2.000		93.345		0.000		-		0.000	0.000	96.045	N/A

Remarks

Increase in Test and Evaluation funding due to transfer of Integrated Test Force (ITF) requirements from SDD to C2D2 budget.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AFLCMC Civilian Pay	Various	AFLCMC CIVPAY : Wright Patterson, AFB	0.000	29.377	Oct 2016	44.700	Oct 2017	0.000		-		0.000	0.000	74.077	-
Financial Mgmt Database Support IDS	Various	Various : Various	0.000	0.000		0.800	Jan 2018	0.000		-		0.000	0.000	0.800	-
Earned Value/Finance/ Cost ACT-I	Various	Various : Various	0.000	0.000		4.500	Jan 2018	0.000		-		0.000	0.000	4.500	-
CIO BOS	Various	Various : Various	0.000	0.000		20.000	Jan 2018	0.000		-		0.000	0.000	20.000	-
Systems System High BOS	Various	Various : Various	0.000	0.000		9.336	Jan 2018	0.000		-		0.000	0.000	9.336	-
Other CIO Services	Various	Various : Various	0.000	0.000		8.239	Jan 2018	0.000		-		0.000	0.000	8.239	-
Travel	Various	Various : Various	0.000	1.900	Oct 2016	3.322	Oct 2017	0.000		-		0.000	0.000	5.222	-
		Subtotal	0.000	31.277		90.897		0.000		-		0.000	0.000	122.174	N/A

Remarks

Increase in Managment Services funding due to transfer of Integrated Test Force (ITF) requirements from SDD to C2D2 budget.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals	183.889	167.902		738.389		0.000		-		0.000	0.000	1,090.180	N/A
0604810M JSF Continuous Capability Development and Delivery	-	29.691		144.958		-		-		-			-
International Continuous Capability Development and Delivery	-	65.008		150.168		-		-		-			-
0207142F JSF Continuous Capability Development and Delivery	-	48.162		299.408		-		-		-			-
Project Cost Totals	183.889	25.041		143.855		0.000		-		0.000	0.000	1,090.180	-

Remarks

Subtotals and totals may not add due to rounding.

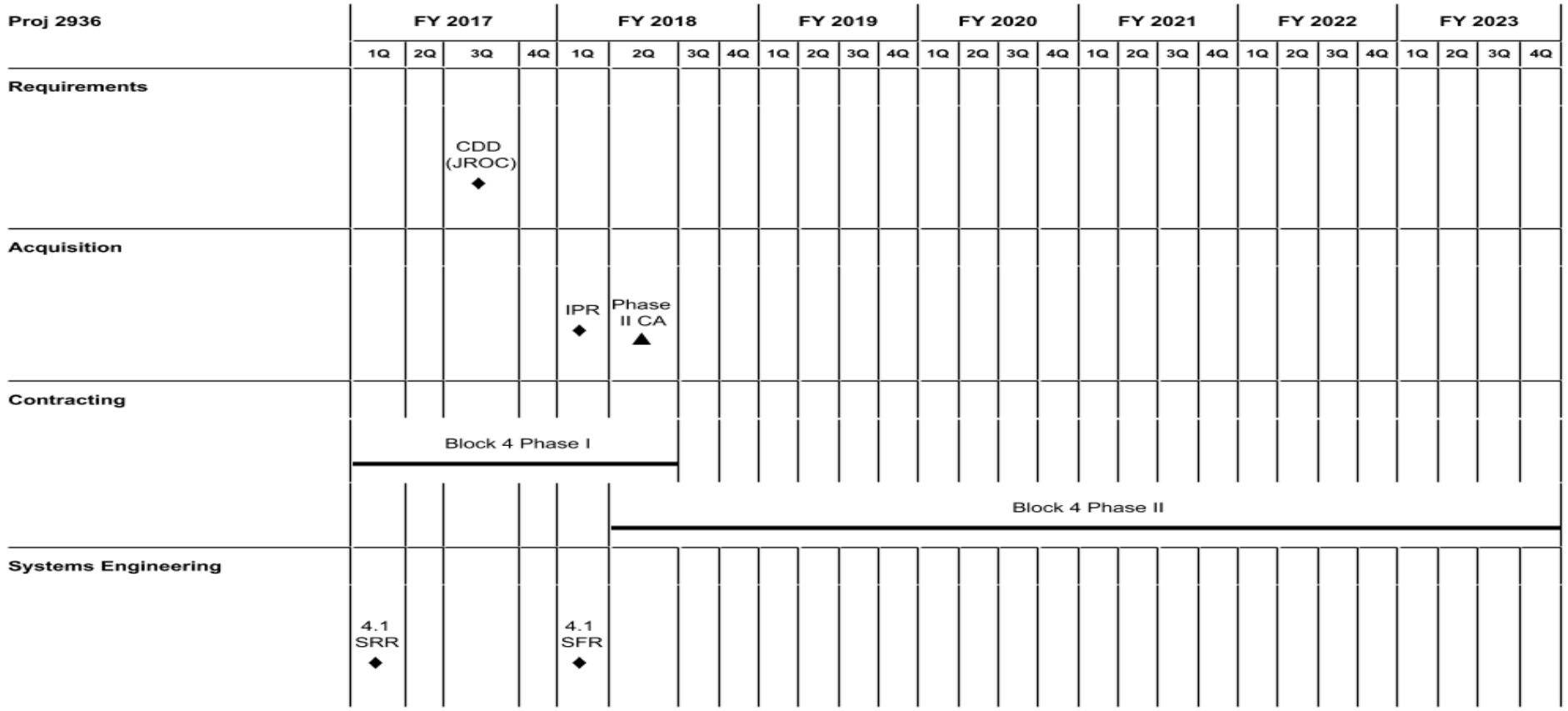
Prior Year reflects $75.951M USAF/$30.286M USN/$29.726M USMC/$47.926M International/Total $183.889M

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	Project (Number/Name) 2936 / *F-35C C2D2*	

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract

FY 2017 reflects $ 48.162M USAF/$ 25.041M USN/$29.691M USMC/$65.008M International/Total $167.902M
FY 2018 reflects $299.408M USAF/$143.855M USN/$144.958M USMC/$150.168M International/Total $738.389M
Fy 2019 reflects continues in PE 060480

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*



2019PB - 0604810N - 2936

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604810N / *(U)Joint Strike Fighter Follow On Mod (FoM) - Navy*	**Project (Number/Name)** 2936 / *F-35C C2D2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2936				
Requirements: Final CDD (JROC)	3	2017	3	2017
Acquisition: Block 4 Phase II Contract Award	2	2018	2	2018
Acquisition: Interim Program Review (IPR) FY18	1	2018	1	2018
Contracting: Block 4 Phase I	1	2017	2	2018
Contracting: Block 4 Phase II	2	2018	4	2023
Systems Engineering: 4.1 System Requirements Review (SRR)	1	2017	1	2017
Systems Engineering: 4.1 System Functional Review (SFR)	1	2018	1	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605013M *I Marine Corps IT Dev/Mod*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	82.498	3.744	14.865	14.005	-	14.005	3.797	3.026	2.519	2.583	Continuing	Continuing
2906: *Marine Corps IT*	82.498	3.744	14.865	14.005	-	14.005	3.797	3.026	2.519	2.583	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program establishes, sustains, and continuously refines computing platforms and Information Technology (IT) services as tested, certified and reusable components of a Marine Corps IT framework that spans the range of military and garrison operations.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.856	14.865	16.020	-	16.020
Current President's Budget	3.744	14.865	14.005	-	14.005
Total Adjustments	-1.112	0.000	-2.015	-	-2.015
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.936	0.000			
• SBIR/STTR Transfer	-0.177	0.000			
• Program Adjustments	0.000	0.000	-1.845	-	-1.845
• Rate/Misc Adjustments	0.001	0.000	-0.170	-	-0.170

Change Summary Explanation

The FY 2019 funding request was reduced by ($1.458) million to account for the availability of prior year execution balances.

The FY 2019 funding request was reduced by $0.800M in MCEITS, $0.343M in Paperless Office/Acquisition Systems and $0.315M in the MOS program to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013M / *Marine Corps IT Dev/Mod*	Project (Number/Name) 2906 / *Marine Corps IT*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2906: *Marine Corps IT*	82.498	3.744	14.865	14.005	-	14.005	3.797	3.026	2.519	2.583	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 2019 funding request was reduced by $0.800M in MCEITS, $0.343M in Paperless Office/Acquisition Systems and $0.315M in the MOS program to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

Manpower Operations Systems (MOS) is a portfolio of enterprise IT systems and modules that support manpower business operations for the Total Force (active and reserve). The investment in the portfolio improves dataflow and increases reliability, functionality, and accuracy of data while reducing the manpower required to operate and maintain these systems/operations. Development is partially driven by regulatory and policy changes mandated by Congress, DOD, Department of the Navy (DON), and United States Marine Corps (USMC). These systems support all five tiers of Manpower: 1) Individual Marine, 2) Small Unit Leader; 3) Unit, 4) Installation Personnel Administration Center (IPAC)/Disbursing Echelon, and 5) Headquarters Marine Corps (HQMC) Manpower and Reserve Affairs (M&RA)/ Defense Finance and Accounting Service. The MOS portfolio provides support in functional areas such as permanent change of station assignments, retention, mobilization, manpower planning, line of duty determination, personnel accountability, individual augmentation, personnel records management and maintenance, management of case incidents, civilian professional development planning, pay entitlement determinations, promotion and performance evaluations and self-service/visibility of personnel data. MOS programs interface with other systems to provide manpower data and web services functionality for pay and personnel transactions between systems. Systems in the portfolio include the Web-enabled Manpower Assignment Support System (WebMASS), Performance Evaluation System (PES), Total Force Retention System (TFRS), Optical Digital Imaging - Records Management System (ODI-RMS), Manpower Mobilization Assignment System (MMAS), and the Requirements, Transition and Manpower Management System (RTAMMS) Total Force Administration System (TFAS) (composed of the Secure Personnel Accountability (SPA) Module, Automated Performance Evaluation System (APES) and the Drill Management Module (DMM). The current system has become obsolete and is unable to maintain an acceptable Cyber Security posture. Modernization efforts will involve business process and application reengineering; delivering an application on a modern and secure platform.

Marine Corps Enterprise Information Technology Services (MCEITS) provides an overarching portfolio of capabilities to deliver "Power to the Edge" for the Marine Corps. Born from an effort to establish a Continuity of Operations Plan of HQMC Automated Information Systems, MCEITS enables realignment of the existing USMC environment of applications, databases, networks, and facilities into an integrated architecture of programs to deliver new information technology capabilities based on a common infrastructure and shared services. MCEITS is a unifying framework of both the Enterprise Services to be delivered, and the infrastructure and systems which must be deployed to enable delivery of those services. Initially it will encompass the Operational, Technical, and Systems architectures of the enterprise environment. However, ultimately it will extend to transform information access both in garrison and in the deployed environment. Combined with policy, procedure and standards provided by HQMC (C4), MCEITS will allow for architectural standardization, consolidated management, and seamless interoperability of and access to the data residing in currently fielded applications (business and tactical). Testing efforts will be focused on MCEITS provided services operating within a MCEITS hosting environment. MCEITS enables services to be federated throughout the Marine Corps to include Content Discover and Delivery, Collaboration and Text Chat, between the service consumer and provider. Efforts for MCEITS will focus on application migration development, the analysis, research and design of increments 3 & 4 and the technology

refreshed software and hardware infrastructure, modernized and enhanced MCEITS high availability, automation and service management with continued Pre-Planned Product Improvements (P3I) efforts.

Marine Corps Recruiting Information Support System (MCRISS) is an enterprise level system to automate administrative procedures for the recruiting station operations. This customized automated System, centered on procedures in the Guidebook for Recruiters, Volume I, dramatically improves efficiency and effectiveness in Marine Corps recruiting. Furthermore, Military Entrance Processing Command requires Marine Corps recruiting to provide information in electronic format only. MCRISS is the Marine Corps Recruiting Command's program to manage applicant processing from commitment to accession/commission into the Marine Corps and Marine Corps Reserve. This enterprise approach allows for efficient sharing of information about potential recruits and recruiter screening efforts, yielding a more cost effective process. The current system requires modernization of the systematic recruiting components to provide efficiency for the Recruiting force from the Headquarters element down to the Recruiter, and requires numerous updates in order to become fully compliant with Cyber Security and CNA policies and mandates to protect PII/PHI data captured and stored in the system. The Modernization effort will involve a competitive evaluation of several prototype systems, leading to a selection of a viable platform and the complete replacement of the current MCRISS system with modern and secure technology.

Paperless Office/Acquisition (PA) funding supports development and enhancement of Purchase Request (PR) Builder which is the Marine Corps enterprise solution for the electronic generation of purchase requests, funding documents, miscellaneous payments, and serves as the front-end system for feeding the DOD enterprise contracting writing system Standard Procurement System (SPS). Development and enhancement of PR Builder is required to ensure financial and contracting functional requirements and Marine Corps business processes are developed, designed, tested and implemented within the system. PR Builder has instituted a quarterly release schedule based on prioritized requirements received from the Functional Requirements Board. Modifications to the contract are required for each release once Level of Effort (LOE) and costs are known. Funding also supports the development of the Electronic Procurement System (EPS)the future replacement for the Standard Procurement System (SPS). Future DOD, DON, and USMC initiatives that will need to be researched and developed include support or adherence to: Standard Financial Information Structure (SFIS), Standard Line of Accounting (SLOA), and Purchase Request Data Standards (PRDS).

Defense Readiness Reporting System-Marine Corps (DRRS-MC) - the Force Preservation Program Tool Integrated Clinical Management-Risk Mitigation System (FPPT ICM-RMS) funding will develop a software program that will provide a Force Preservation Tool that utilizes a risk algorithm to proactively identify at-risk service members. FPPT ICM-RMS was established to provide Commanders with a real-time, objective, and holistic assessment of their Marines that integrates medical, mental health, and command input. Designed specifically to drive the force preservation process, FPPT ICM-RMS will provide Commanders with critical information from multiple input sources required to track behavioral changes, assign risk score, and send automated alerts to leadership of at risk personnel and other key force preservation indicators. The FPPT ICM-RMS development was initiated 4th quarter FY16 with $2.428M to support an approved Universal Need Statement.

Risk Management Initiative (RMI) funding addresses outdated Safety systems, capability gaps and support logistics Information Technology (IT) portfolio rationalization. When completed, RMI will consolidate DoN risk management requirements into a single Program of Record (POR) and provide modern Safety capabilities for the military component of the Navy Total Force (both active and reserve). The USN serves as the lead for this effort with the Marine Corps providing a fair share towards development starting in FY16 (~20%). RMI capability consists of four distinct increments of capability: (1) Streamlined Incident Reporting (SIR), (2) Single Point of Entry (SPOE), (3) Safety Program Management (SPM), (4) Analysis and Dissemination (A&D). These four pillars will enable agile responses to business rule changes, automation of routine actions, improvement of data integrity and facilitation of self-service for organizations and individuals.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

Technology Services Organization (TSO): This Technical refresh/upgrade of SABRS database technology from ADABAS to a newer database architecture provides a modern and well-supported database technology that ultimately enables the normalization of Marine Corps financial data in a true relational database.
The newer database architecture will provide a modern data platform to support transactional operations within the DON General Fund accounting systems to optimize performance, readily scale, and reliably support data structure, quality, and availability for subsequent analysis to drive decision making. Successful implementation will be transparent to the SABRS user community while minimizing the potential for unanticipated system degradation/outages and secure the system's operational longevity. This Multi phased project (over 4 years), system supports 5k+ direct users, impacts entire DON General Funds accounting. Out year costs will be assumed into planned sustainment of SABRS.
The current configuration is antiquated with diminishing industry support. There is a limited pool of applicants available to work on ADABAS. Sustainment is cost prohibitive and the technology stack limits flexibility to fully support 21st century data/system requirements. TSO will be unable to mitigate identified technical and support risk associated with current technology which could result in systems degradation and/or outage. This further leaves TSO unable to improve data integrity and audit compliance in SABRS by employing a more modern database.
The impact on the operational capability is the risk to DON accounting and Financial Management operations increases daily for major system degradation or outage in both likelihood of occurrence and extent of the negative impact of such an occurrence. This will result in the system becoming less and less viable to the point where it will no longer support Marine Corps operations.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Defense Readiness Reporting System-Marine Corps (DRRS-MC)	0.000	1.412	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Complete development of ICM-RMS system enhancements					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The $1.412M decrease from FY18 to FY19 is the result of completion of this phase of system enhancements.					
Title: MANPOWER OPERATIONS SYSTEMS (MOS)	0.000	6.203	2.863	0.000	2.863
Articles:	-	-	-	-	-
FY 2018 Plans: Initiate Optical Digital Imaging - Records Management System (ODI-RMS) and Manpower Personnel Administration (MPA) Modernization efforts.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue Optical Digital Imaging - Records Management System (ODI-RMS) Modernization effort. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $3.340M decrease from FY18 to FY19 supports the Manpower Personnel Administration (MPA) Modernization. Funding has moved to Technology Services Organization (TSO). Modernization will involve business process and application reengineering; delivering an application on a modern and secure platform.					
Title: MARINE CORPS ENTERPRISE INFORMATION TECHNOLOGY SERVICES (MCEITS) ***Articles:*** ***FY 2018 Plans:*** -Continued to scale infrastructure capacity to host additional applications planned to migrate. -Continued analysis, research, and design for the MCEITS Increment 3 & 4 and Development Environment. ***FY 2019 Base Plans:*** -Continue to scale infrastructure capacity to host additional applications planned to migrate. -Continue analysis, research, and design for the MCEITS Increment 3 & 4 and Development Environment. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase of $0.119M from FY2018 to FY2019 is a result of a re-phasing of the program to properly align resources with the current acquisition schedule.	2.644 -	1.376 -	1.495 -	0.000 -	1.495 -
Title: MARINE CORPS RECRUITING INFORMATION SUPPORT SYSTEM (MCRISS) ***Articles:*** ***Description:*** The effort will support the modernization of MCRISS. The current system requires modernization of the systematic recruiting components to provide efficiency for the Recruiting force from the Headquarters element down to the Recruiter, and requires numerous updates in order to become fully compliant with Cyber Security and CNA policies and mandates to protect PII/PHI data captured and stored in the system. The Modernization effort will involve a competitive evaluation of several prototype systems, leading to a selection of a viable platform and the complete replacement of the current MCRISS system with modern and secure technology.	0.700 -	4.289 -	4.253 -	0.000 -	4.253 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: -Continue MCRISS Modernization effort. ***FY 2019 Base Plans:*** -Continue MCRISS Modernization effort. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: PAPERLESS ACQUISITION (PA)	0.000	0.335	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete development of Engineering Change Proposals (ECPs). ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: TECHNOLOGY SERVICES ORGANIZATION (TSO)	0.000	0.450	5.394	0.000	5.394
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate research and development of the most efficient approach for transitioning the DON General Fund Accounting System, SABRS, to a modern data platform (FY18). ***FY 2019 Base Plans:*** - Continue research and development of the most efficient approach for transitioning the DON General Fund Accounting System, SABRS, to a modern data platform. - Initiate Manpower Personnel Administration (MPA) Modernization efforts. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $4.944M increase from FY18 to FY19 supports the Manpower Personnel Administration (MPA) Modernization. MPA funds were previously reported under the Manpower Operating Systems Accomplishments/ Program Plans. Modernization will involve business process and application reengineering; delivering an application on a modern and secure platform.					
Title: SAFETY - RISK MANAGEMENT INITIATIVE (RMI) ***Articles:*** ***Description:*** RISK MANAGEMENT INITIATIVE (RMI) The RMI program is a consolidation of Navy and Marine Corps risk management requirements into a single safety system, thus eliminating the need to modify multiple legacy systems. The Navy serves as the lead for this effort with the Marine Corps providing a fair share (approximately 20%) towards the research and development of the RMI system starting in FY16. The Navy portion is funded in PE 0605013N / Information Technology Development; Project 2905.L39 / BUPERS IT ***FY 2018 Plans:*** - Complete Contract funding for Analysis & Dissemination (A&D). - Complete Testing Phase for Analysis & Dissemination (A&D). - Complete Contract funding for Safety Program Management (SPM). - Complete SPM Design and Business Case Analysis (BCA). ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease of $0.800M from FY2018 to FY2019 is a result of the completion of the USMC's RMI development efforts.	0.400 -	0.800 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	3.744	14.865	14.005	0.000	14.005

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/4630 - MCRISS: *MC Recruiting Info Support System*	0.049	0.049	0.362	-	0.362	0.050	0.050	0.051	0.052	Continuing	Continuing
• PMC/4630 - PA: *Paperless Office/Acquisition*	0.000	0.122	0.124	-	0.124	0.127	0.130	0.133	0.136	Continuing	Continuing
• PMC/4630-MCEITS: *MC Enterprise IT Services*	2.954	11.036	25.128	-	25.128	17.587	4.018	4.130	4.213	Continuing	Continuing
• PMC/4620- MOS: *Manpower Operations Systems (MOS)*	0.294	0.241	0.246	-	0.246	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/4630 - TSO: *Technology Services Organization (TSO)*	0.841	1.305	0.878	-	0.878	0.891	0.909	1.404	0.945	0.000	8.002
• PMC/4620 - TSO: *Technology Services Organization (TSO)*	0.000	0.000	0.000	-	0.000	3.000	3.000	0.000	0.000	0.000	6.000

Remarks

D. Acquisition Strategy

Organizational Messaging Service (OMS) is a Joint Acquisition Category (ACAT) IAM program. It is Assistant Secretary Defense Command, Control, Communication and Intelligence mandated. Each year the Joint Interoperability Test Command (JITC) runs Operational Test (OT) assessments on OMS software versions and maintenance releases. Marine Corps participation is vital to ensuring that the implementation of OMS is interoperable with all DOD CINCs, services, and agencies. Furthermore, as follow-on organizational messaging solutions for OMS are being identified, materiel solution analysis activities will be conducted. In FY16, OMS will procure Hyper Converged Virtualization Platforms and switches to replace the current equipment that can no longer be warrantied and is necessary to remain compliant with ATO requirements.

Manpower Operations Systems (MOS) within this portfolio follows an Evolutionary Acquisition (EA) approach: 1. Define, develop, and deliver an initial or "core" capability based on mature technology. 2. "Core" capability will be incrementally improved over an extended period of time. Incremental Development Model: 1. Iterative cycles of requirements definition, design, build and evaluation. The contracting strategy across the portfolio is to utilize competitive firm-fixed price contracts.

Marine Corps Enterprise Information Technology Services (MCEITS) is using an incremental acquisition approached implemented in separate releases followed by Pre-Planned Product Improvements (P3Is) delivering capabilities faster and more efficiently. The program will deliver an initial capability and continue integration and production of the system in accordance with the USMC Information Enterprise Strategy. The objective is to balance needs with available commercial and government solutions and resources, and to rapidly adopt evolving technologies and requirements and keep pace with the continuously evolving DoD Net-Centric enterprise to provide capabilities to the Marines. This strategy is supported by an Indefinite Delivery Indefinite Quantity contracting vehicle which will allow the contractor to provide the full range of capabilities, services and solutions necessary to satisfy the requirements through incremental implementation of technology, processes and capabilities.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

Capabilities will be delivered through individual task orders to ensure technology and services are inserted according to the overall program goals, user requirements and program schedule.

Paperless Acquisition (PA) will use an incremental development methodology utilizing short development periods. The contracting strategy is to use a firm-fixed price contract to reduce risk to government, with additional capabilities defined by a Marine Corps Configuration Control Board and delivered to the service integrator as a modification to the contract. The delivery of small functional capabilities allows for measurable enhancements to the base system while keeping Post Deployment System Support costs relatively low.

Defense Readiness Reporting System-Marine Corps (DRRS-MC) is a Mission Assurance Category I (MAC I) Classified system that integrates information on reportable unit readiness (Marines/ Equipment) and mission effectiveness of deployed and contingency forces. Mission (Core/Assigned) determined to be vital to the operational readiness and mission effectiveness of deployed and contingency forces. The operation mission of Force Preservation Program Tool Integrated Clinical Management-Risk Mitigation System (FPPT ICM-RMS) is that it will enable Commanding Officers and Senior Enlisted Advisors to make informed decisions on force preservation assessments.

Marine Corps Recruiting Information Support System (MCRISS) utilizes modular/incremental development to maintain system operability while allowing for continued development. Contracting strategy for Legacy system support includes competitive firm-fixed price IDIQ contracts; MCRISS Modernization effort to be executed leveraging direct-award opportunity to a qualified 8(a) small business partner.

Risk Management Initiative (RMI) consolidates risk management requirements into a single system utilizing a single vendor Indefinite Delivery / Indefinite Quantity (IDIQ). The USN serves as the lead for the RMI effort with the Marine Corps providing a fair share towards development. The approach for RMI is an incremental COTS configuration model providing usable increments of capability within 24-month cycles after funds certification for each. Development of the Streamlined Incident Reporting and Single Point of Entry capability increments via separate task orders using RDT&E .

Technology Services Organization (TSO) SABRS: FY19 Funding ($5,394K RDT&E) will assist with research and development of the most efficient approach for transitioning the DON General Fund Accounting System, SABRS, to a modern data platform in order to eliminate the risk associated with an aging and expensive technology with dwindling number of technical experts. This Technical refresh/upgrade of SABRS database technology from ADABAS to a newer database architecture provides a modern and well-supported database technology that ultimately enables the normalization of Marine Corps financial data in a true relational database.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013M / *Marine Corps IT Dev/Mod*	Project (Number/Name) 2906 / *Marine Corps IT*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DRRS-MC (FPPT ICM-RMS) - Software Development	FFRDC	Georgia Technical Institute : Atlanta, GA	2.428	0.000		0.000		0.000		-		0.000	0.000	2.428	-
MOS ODI-RMS Modernization	TBD	TBD : TBD	0.000	0.000		3.203	Mar 2018	2.863	Mar 2019	-		2.863	0.000	6.066	-
MCEITS P3I Efforts	C/IDIQ	SAIC : McLean VA	5.532	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MCRISS Modernization	SS/IDIQ	CHENEGA DECISION SCIENCES, LLC : Lorton, VA	0.000	0.700	Sep 2017	4.289	Jan 2018	4.253	Jan 2019	-		4.253	0.000	9.242	-
Paperless Ofc Acq Dev	C/FFP	TBD : TBD	0.000	0.000		0.335	Jun 2018	0.000		-		0.000	Continuing	Continuing	Continuing
RMI	C/BA	SPAWAR: : San Diego, CA	0.000	0.400	Jan 2017	0.800	Jan 2018	0.000		-		0.000	0.000	1.200	-
DRRS-MC (FPPT ICM-RMS) - Software Development	TBD	TBD : TBD	0.000	0.000		1.412	Apr 2018	0.000		-		0.000	0.000	1.412	-
MOS MPA Modernization	TBD	TBD : TBD	0.000	0.000		3.000	Jul 2018	5.000	Jul 2019	-		5.000	0.000	8.000	-
TSO	TBD	TBD : TBD	0.000	0.000		0.450	Aug 2018	0.394	Aug 2019	-		0.394	0.000	0.844	-
Prior Years Cumulative Funding	Various	Various : Various	44.639	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	52.599	1.100		13.489		12.510		-		12.510	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Years Cumulative Funding	Various	Various : Various	14.876	0.000		0.000		0.000		-		0.000	0.000	14.876	-
MCEITS Pilot Services	C/BA	TBD : TBD	0.000	0.000	Jun 2017	0.000		0.000		-		0.000	0.000	0.000	-
MCEITS Application Migration Support	C/FFP	SYNEREN : Arlington, VA	0.657	0.836	Feb 2017	1.296	Feb 2018	1.495	Feb 2019	-		1.495	0.000	4.284	-
MCEITS Application Development Testing	C/BA	SYNEREN : Arlington, VA	1.061	1.508	Aug 2017	0.000		0.000		-		0.000	0.000	2.569	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013M / *Marine Corps IT Dev/Mod*	Project (Number/Name) 2906 / *Marine Corps IT*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCEITS HSI Support	WR	NSWC : Dahlgren VA	0.240	0.050	Oct 2017	0.080	Jan 2018	0.000		-		0.000	0.000	0.370	-
MCEITS EITC Support	WR	SPAWAR : Charleston SC	0.206	0.250	Jan 2017	0.000		0.000		-		0.000	0.000	0.456	-
		Subtotal	17.040	2.644		1.376		1.495		-		1.495	0.000	22.555	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MCEITS Enterprise Architecture	Various	Various : Various	10.653	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	Various : Various	0.652	0.000		0.000		0.000		-		0.000	0.000	0.652	-
MCEITS Modeling & Simulation	C/FFP	TSC : Silver Spring MD	1.554	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	12.859	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	82.498	3.744		14.865		14.005		-		14.005	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

MOS Schedule

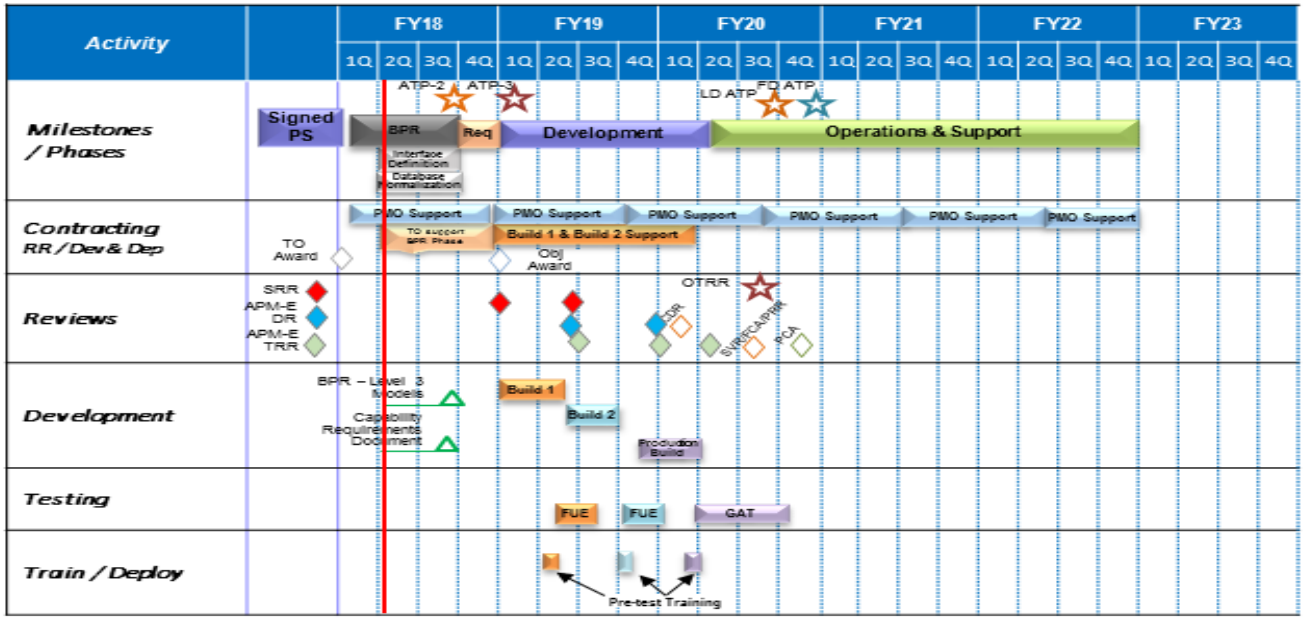

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

MCRISS Schedule

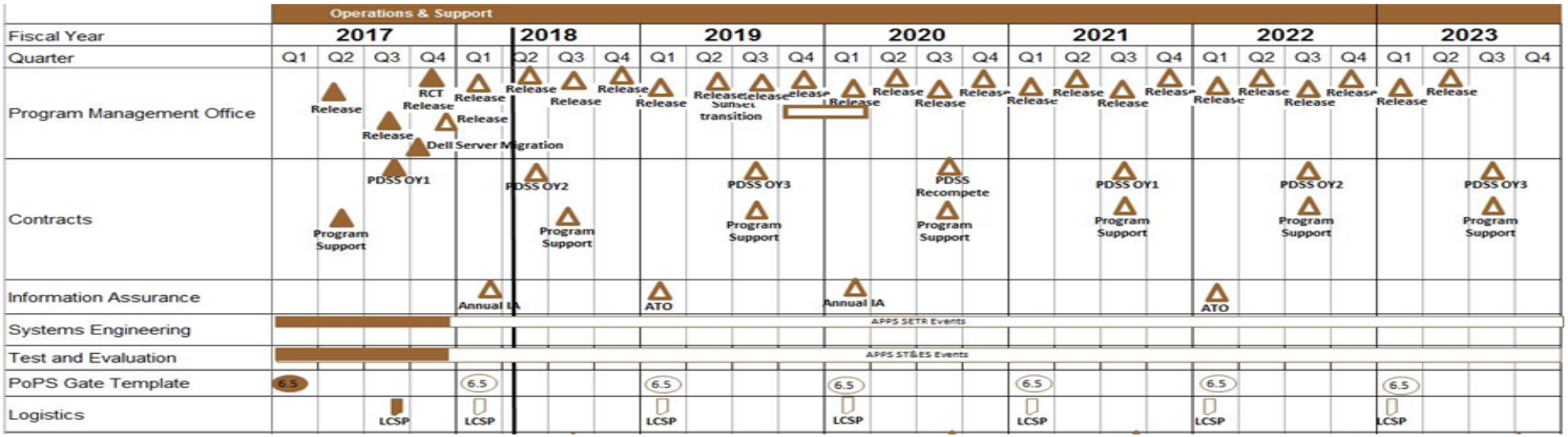

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

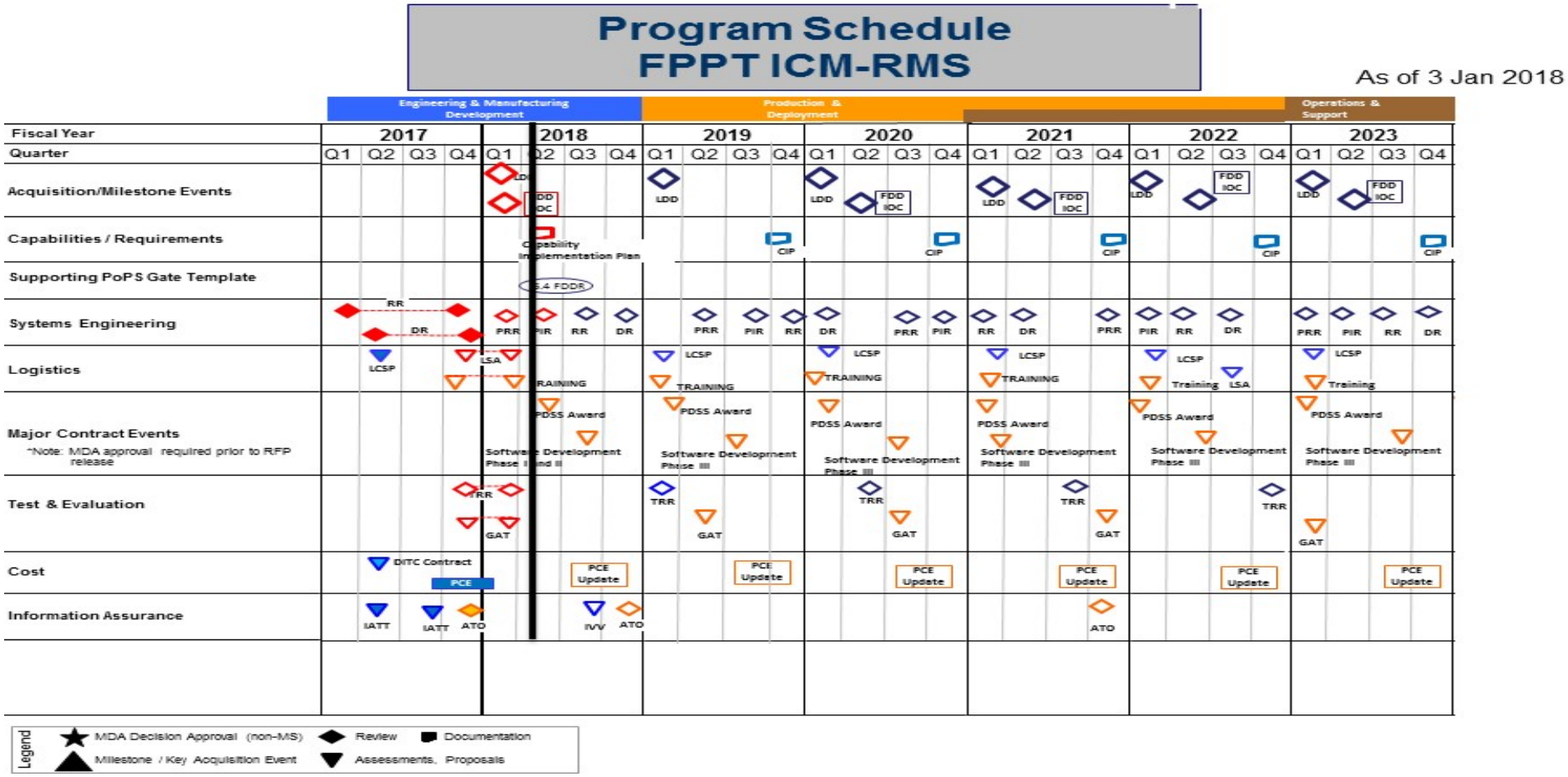

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

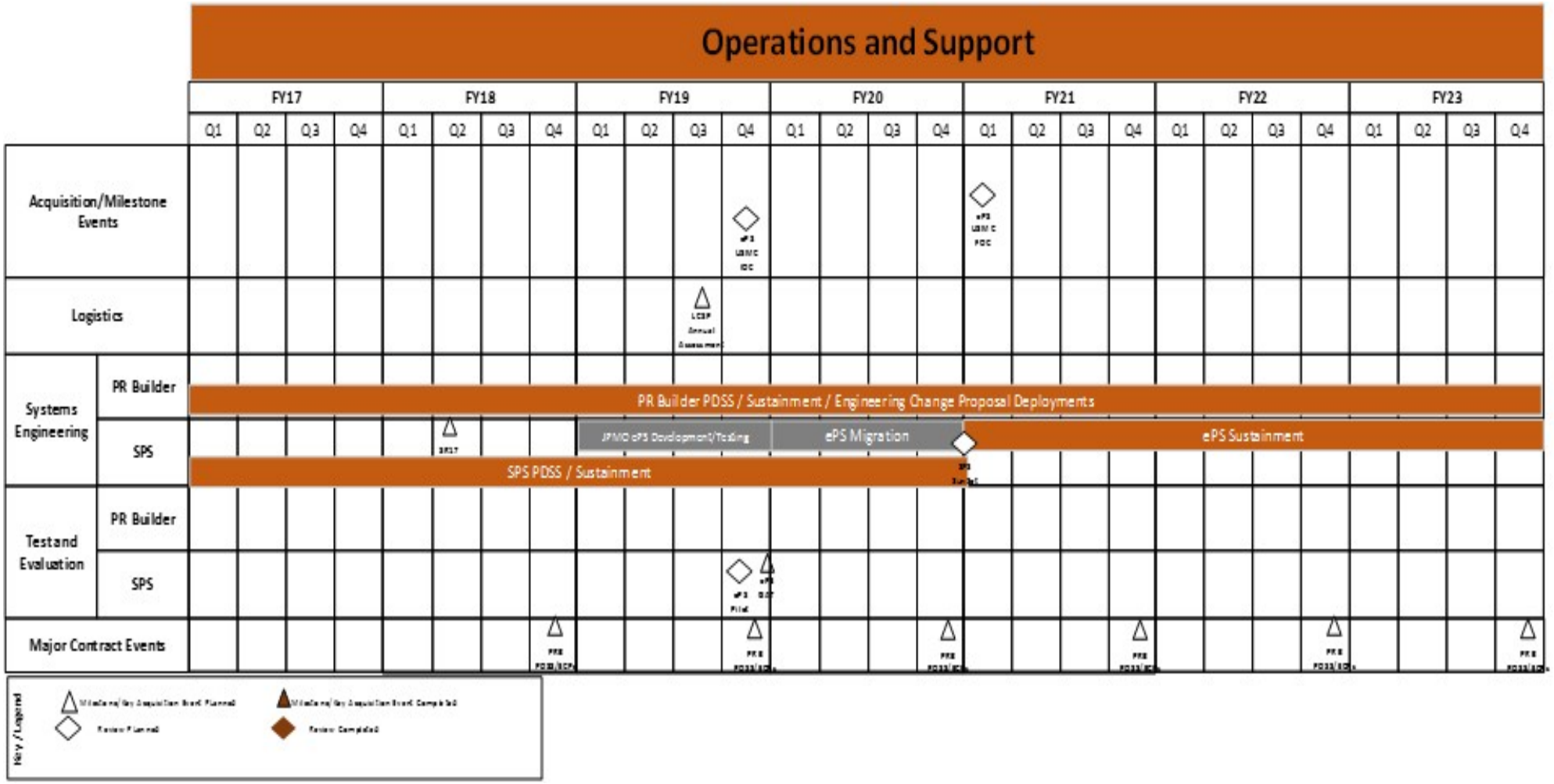

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

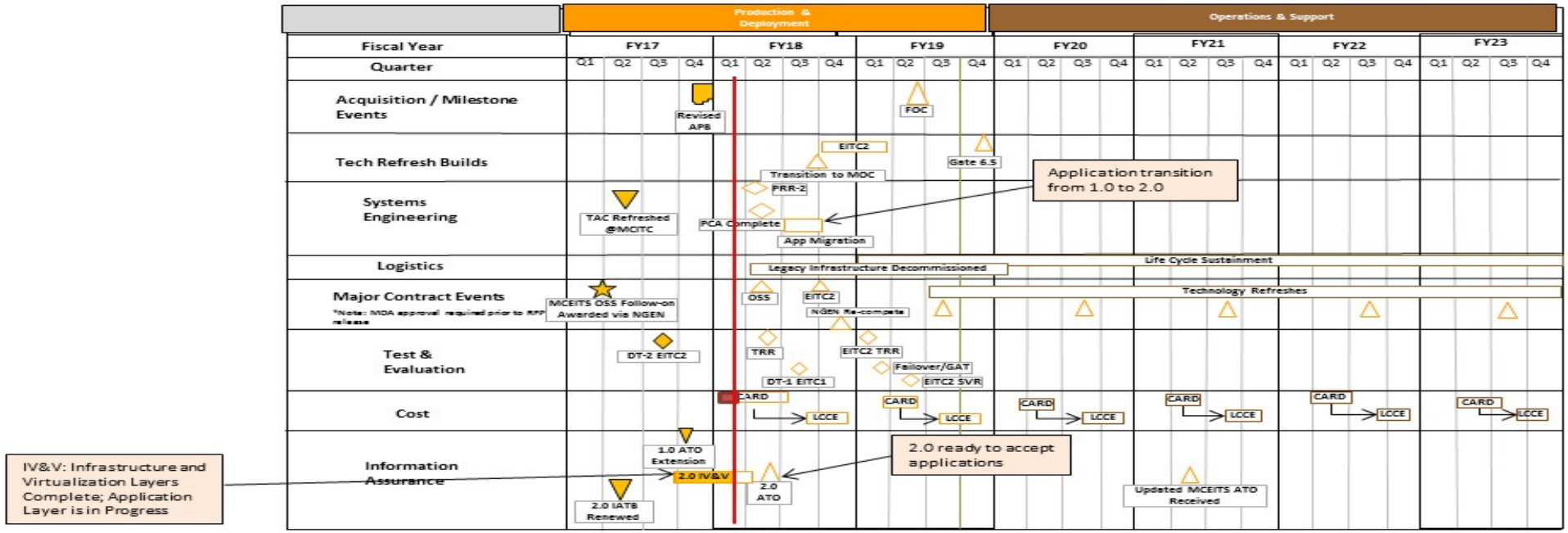

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013M / *Marine Corps IT Dev/Mod*	**Project (Number/Name)** 2906 / *Marine Corps IT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2906				
Increment 1 Full Operational Capability (FOC) (MCEITS)	2	2019	2	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605013N *I Information Technology Development*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	339.429	87.469	152.977	268.567	-	268.567	375.700	331.988	186.489	160.836	Continuing	Continuing
2901: *AAUSN IT*	46.521	14.704	17.530	34.682	-	34.682	39.230	22.229	5.745	2.287	Continuing	Continuing
2903: *NAVAIR IT*	9.689	5.157	10.915	19.144	-	19.144	19.833	7.818	5.660	2.315	Continuing	Continuing
2904: *NAVSEA IT*	155.226	26.018	64.233	37.855	-	37.855	22.613	20.663	11.934	16.134	Continuing	Continuing
2905: *BUPERS IT*	57.890	26.127	52.957	99.289	-	99.289	162.961	157.299	78.776	64.429	Continuing	Continuing
3167: *Joint Technical Data Integration (JTDI)*	30.215	5.327	2.533	3.883	-	3.883	4.944	4.288	4.036	4.117	Continuing	Continuing
3185: *Joint Airlift Information System (JALIS)*	1.698	0.316	0.348	0.353	-	0.353	0.349	0.356	0.364	0.372	Continuing	Continuing
3432: *NMMES-TR*	0.000	0.000	0.000	44.999	-	44.999	81.579	64.681	58.923	40.561	Continuing	Continuing
9406: *Maintenance Data Warehouse*	38.190	9.820	4.461	28.362	-	28.362	44.191	54.654	21.051	30.621	Continuing	Continuing

Note

The FY 2019 funding request was reduced by $19.023 million to account for the availability of prior year execution balances

A. Mission Description and Budget Item Justification

2901 AAUSN IT

DEPARTMENT OF NAVY TASKING RECORDS AND CONSOLIDATED KNOWLEDGE ENTERPRISE REPOSITORY (DoN TRACKER)
Department of the Navy Tasking, Records and Consolidated Knowledge Enterprise Repository (DON TRACKER - formerly known as Enterprise Records and Task Management (ERTM)) is a single, auditable, compliant Records and Task Management process, implemented uniformly across all DON Divisions and Commands, and administered by DON/AA, to enable efficient and effective execution of Records Management (RM) and Task Management (TM) policy in compliance with statute.

NMCI ENTERPRISE SERVICE TOOLS (NEST)

The increase from FY18 to FY19 is due to the following major efforts: the Middleware Implementation, CDR Integration Implementation and ITPR/Demand Management. These efforts are focused on providing continuity of IT service lifecycle management processes during the transition from NGEN contract to NGEN-R contract(s).

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013N *I Information Technology Development*

The NEST is comprised of the NMCI Enterprise Tool (NET) and Requirements to Award Tool (RAPT) user interfaces, which enables the consumption of services from NMCI IT service contracts. RAPT manages the requirements approval process via workflows and stores associated contract documentation. NET serves as the sole customer interface to the order-to-payment process for NMCI. NEST and its associated interfaces manage the lifecycle for NMCI IT services.

ELECTRONIC PROCUREMENT SYSTEM (ePS)

The increase from FY18 to FY19 is required for the start of the Limited Deployment (LD) phase of the ePS program and software hosting. Delivering required functionality to a subset of the DON, LD will involve 210 critical users from five sites and will include data migration, interface development, audit support, software configuration, software installation, test and evaluation, and gap closure. Limited deployment encompasses a contract award in January 2019, originally scheduled for end of FY18. Funding profile has been adjusted to account for shift in award date.

ePS provides the Department of the Navy Solution for Electronic Contract Writing replacing the existing Standard Procurement System (SPS) and DoN Integrated Contracting Environment (DICE) capabilities and deficiencies. ePS aligns Contract Writing System (CWS) with Financial Improvement Audit Readiness requirements mandated by Congress and the Department of Navy's goal for an auditable link between financial management and contract writing system. It supports strategic sourcing and seamless exchange of data in addition to evolving to meet changing requirements. The improved capabilities will meet emerging data standards Procurement Data Standards/Procurement Request Data Standards (PDS/PRDS), in addition to complying with Office of the Secretary of Defense (OSD) Clause Logic Service. ePS meets the intent of the National Defense Authorization Act of 2013 by providing an electronic means to award contracts.

DONAA IT

The Modernization Initiative includes multiple projects with RDT&E requirements: Multiple Threat Alert Center (MTAC), Data Modernization & Analytical Tools, Knowledge Network (K-Net), Consolidated Law Enforcement Operations Center (CLEOC), and Data Modernization of the Secretariat Automated Resources Management Information System (SARMIS). RDTEN funding will optimize DONAA's capability to make necessary improvements to various Secretariat systems. This modernization will ensure compliance with continued financial emerging requirements. Enhancement of financial auditability will be in compliance with DOD security system requirements.

MULTIPLE THREAT ALERT CENTER (MTAC)
The Post-Cole Secretary of the Navy Anti-terrorism/Force Protection Task Force identified the need for NCIS to enhance the Multiple Threat Alert Center (MTAC). The MTAC provides key anti-terrorism/force protection products in response to Fleet tasking and is critical to Fleet protection during current Overseas Contingency Operations (OCO). This project provides funding for the development of an IT system to track the movement of NCIS special agents deployed in advance of DoN in-transit units. The ability to track and communicate with these agents is necessary in order to forward threat data to those forward deployed agents and to task them to respond to emerging threats. Funding is required for equipment and contractor support to modify COTS software.

DATA MODERNIZATION & ANALYTICAL TOOLS

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013N *I Information Technology Development*

NCIS data collection, filtering, and analysis infrastructure is unable to handle the increased flow of terrorism investigative and threat reporting of the Post 9/11 era. NCIS must revitalize its infrastructure and its data and investigation management capabilities to effectively counter current terrorist threats. The three main components of this portfolio investment are data modernization, knowledge management, and investigation management.

KNOWLEDGE NETWORK (K-Net)
K-Net is a Data Modernization & analytical tool being developed and soon deployed that greatly enhances NCIS's technological arsenal. K-Net implements an integrated NCIS approach for identifying, capturing, evaluating, retrieving, and sharing all of NCIS's knowledge and expertise. To that end, K-Net is a knowledge management system that improves NCIS's ability to search, analyze, fuse, and distribute both national intelligence and law enforcement information. The envisioned end state for K-Net is a secure, intuitive, web environment that is the one stop shop where applications, data, and tools are easily accessible to all of NCIS users to effectively and securely fulfill their mission regardless of when and where they operate.

CONSOLIDATED LAW ENFORCEMENT OPERATIONS CENTER (CLEOC)
The Naval Criminal Investigative Service (NCIS) enhancement of CLEOC will enable meeting Law Enforcement (LE) reporting requirements, satisfy Congressional mandates for the Defense Incident-Based Reporting System (DIBRS) and improve functionality across the Naval criminal justice community.

DEPARTMENT OF THE NAVY CRIMINAL JUSTICE INFORMATION SYSTEM (DONCJIS)
The Naval Criminal Investigative Service (NCIS) is the Executive Agent (EA) for the Department of the Navy Criminal Justice Information System (DONCJIS). This system provides a cradle to grave criminal justice and law enforcement information system. The system enables multiple communities within the DON to share criminal justice and law enforcement information. Funding is required for contractor support to develop, test, train, deploy and implement this application.

2903 NAVAIR IT

JOINT CONFIGURATION MANAGEMENT INFORMATION SYSTEM (JCMIS)
The Joint Configuration Management Information System (JCMIS) Program is Department of Defense (DoD) standard software system for complete and integrated configuration management (CM) of weapon systems from acquisition to disposal. JCMIS efficiently manages all product structure data, including complex interrelationship between assemblies and subassemblies, technical documentation and the parts that comprise the item. JCMIS is designed to manage and control configuration data to support the DoD business processes. Accurate, complete and accessible configuration data is critical to the successful operations of DoD weapon systems or tracked assets. Mission readiness and operational capabilities are enhanced by JCMIS, as instant consistent integrated configuration data is readily available to operators, maintainers and logistics personnel. This system is a CM tool available DoD wide to support all potential customers. JCMIS provides users with a common database infrastructure to ensure compatibility, quality, and consistency of CM processes and provides configuration managers and analysts the validated CM information necessary for accurate maintenance, spare procurements, reliability and safety analysis, and mission readiness. Funding is budgeted to support the services of re-hosting and testing of COTS upgrades to ensure objective performance of JCMIS is achieved.

TASK FORCE CYBER AWAKENING (TFCA)

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013N *I Information Technology Development*

Cyber Warfare consists of many different aspects to include sabotage of our weapon systems, networks as well as enablement of missions. Nation and non-nation state actors are acquiring and employing more advanced cyber-attacks in order to exploit our networks and aviation systems challenging our technological edge. The threats and capabilities are real and range from exploiting capabilities, overloading weapons systems and logistics supply chains, to jamming signals or taking control of weapons systems. We must defend against adversarial cyber-attacks while contributing to the exploitation of cyber warfare capabilities.
Funding is a continued investment as part of Navy's Cyber strategic priorities to address emergent intelligence and increased cyber threat environment to Naval Aviation weapon systems readiness, survivability and mission assurance in cyber contested environments. Investments are focused on Naval Air Systems Command aircraft, weapons or support equipment, commonly known as Platform Information Technology (PIT) - Control systems, to ensure cyber resiliency and warfighting effectiveness. Investments will develop enterprise tailored solutions, infrastructure capabilities, procedures and customized tools necessary to increase the cyber resiliency of our aircraft, weapons and support equipment against advanced adversary threats in cyber contested environments. These efforts will strengthen our cyber posture by developing research, development, test and evaluation capabilities and solutions to deter, detect, and mitigate cyber threats and safeguard classified Naval Aviation systems and platforms from "cradle to grave." These solutions will be integrated into the acquisition of weapons systems to enhance security, increase lethality, and improve resiliency in the expected operational environments. Our weapon or control systems are unique in the aforementioned environments and mission, but also in the presence of numerous non-traditional access points and trusted cyber relationships.

DIGITAL THREAD (DT)
Digital Thread - Digital Thread (DT) is digital process integration with complete, secure and authoritative data. DT integrates the product life cycle, and includes all the processes that are needed to design, develop, test, produce, and support a product. By connecting these processes, and using a standardized set of digital tools and data, the DT accelerates the product development cycle and lowers costs for support and new capability integration.

The Digital Thread solution also includes development and demonstration of cyber security architectures for sustainment information systems, and development of a digital manufacturing data architecture and repository.

2904 NAVSEA IT

This program includes the funding for Information Technology (IT) support at NAVSEA for the development, support, and sustainment of maritime shore maintenance and includes multiple modernization efforts to insure effectiveness of Fleet maintenance systems as part of the current Navy Maritime Maintenance Enterprise Solution (NMMES). These efforts include retirement and/or replacement of costly legacy systems, transition planning and systems engineering for integration with national and enterprise interim and future solutions. These efforts align with direction to insure that proposed interim solutions support a planned, single maintenance solution end state, as well as direction to align with data center consolidation plans proposed across the FYDP. It includes the modernization of Naval Shipyard and Regional Maintenance Centers' Maintenance, Repair and Overhaul (MRO) production tools. This includes modifications/enhancements to Shipyard IT systems, such as Advanced Industrial Management (AIM); Project Scheduling and Sequencing (PSS); Workload and Performance Systems; the COST and MAT systems, and other solutions such as the Electronic Technical Working Document (eTWD) Initiative. The goal of PMO-IT is to provide modernization, migration and consolidation of obsolete legacy systems to the next generation of centrally hosted tools supporting Fleet Maintenance and national systems for the Navy.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013N *I Information Technology Development*

2905 BUPERS IT

Research and Development Funds for MPT&E Transformation under PE 0604703N have been consolidated within PE 0605013N PU 2905 starting in FY19.

This effort is the linchpin of the Navy's MPT&E (Manpower, Personnel, Training & Education) business IT Transformation strategy which stems from the decision to invest in programs that directly align with the Sailor 2025 vision. The current 70 year old business processes and 40 year old obsolete IT systems will not sustain Fleet anticipated growth and is not cost efficient nor effective. The Transformation strategy involves revolutionary change by rapid implementation of MPT&E business IT products using the Industry Best Practices Model (e.g., early investment for largest ROI, rapid prototyping, and vanilla COTS products usage.) Four projects are the cornerstones of the N1 Transformation strategy. The Navy Standard Integrated Personnel System (NSIPS) will become Navy Personnel and Pay (NP2) and includes personnel and pay modernization and the collapse of Legacy Manpower System functionality. Second, a Single Point of Entry (SPOE) for Sailor self-service is composed of My Navy Portal (MNP), Identity and Access Management (IdAM), a Customer Relations Management (CRM) solution, and a centralized and standardized customer service center (The My Navy Career Center (MNCC)). Third, MPT&E Core Learning Stack improves the accessibility, sophistication, and collaborative nature of educational outreach. Finally, the Authoritative Data Environment (ADE) will enable the collapse of 9 legacy data warehouses into a single, authoritative source of truth for Sailors and Navy decision makers. Additionally, ADE will enable modern data analytics and business intelligence capabilities, taking advantage of current state of practice cloud services, to be leveraged in addressing the Navy's current challenges.

BILLET BASED DISTRIBUTION (BBD)

BBD is a Sailor 2025 initiative aimed at modernizing distribution and order writing systems. The effort begins functional work and follow-on development to collapse Navy Reserve Order Writing System (NROWS), Navy Marine Corps Mobilization Processing System (NMCMPS), Enlisted Assignment Information System (EAIS), and Officer Assignment Information System (OAIS) into a single distribution system. The objective of BBD is to increase personnel readiness, improve fit and provide clear visibility to the impact on mission readiness at the billet level. BBD will facilitate maximizing the contributions of every member of the Navy workforce by delivering competency-based career paths. As part of the Navy's transformation initiative, BBD will be consolidated into the MPT&E Personnel and Pay System technology component.

LEARNING MANAGEMENT SYSTEM - DISTANCE LEARNING (LMS-DL)

LMS-DL is aligned with the Learning Stack (LS) technology component of the Navy's Transformation initiative. LMS-DL supports ready relevant learning, with a focus to align Navy learning, create a career learning continuum, and leverage evolving technologies to expand learning solutions when and where the Sailor needs them. The collaborative learning environment (CLE) is a key component within the learning IT strategy that leverages Commercial-Off-the-Shelf products to integrate the CLE with intelligent tutors, a multi-purpose reconfigurable training system (MRTS), electronic classrooms (ECR), trainers and labs, interactive multimedia instruction (IMI), instructors, and a virtual environment.

As part of the Transformation holistic IT approach, ready & relevant learning requires the development of a Learning Management System that permits:

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013N *I Information Technology Development*

(1) Mobile & flexible delivery of modular training to the sailor
(2) Synchronization of work requirements with learning modules to ensure proper training is delivered at the right time

This funding will develop and deploy new technologies for modularized training in fleet concentration areas to support the continuum of learning to include:

(1) Development, modification or replacement of the current LMS platform
(2) Integration of Manpower, Personnel, Training and Education (MPTE) management tools to support end to end business processes (billet information, assignment, distribution, student management, learning management, personnel information, advancement) that will be impacted by changes to learning delivery and career profiles via Progressive NECs (e.g. Legacy systems: TFMMS,NSIPS, Learning Assessment System, Navy Training Management Planning System and future transformation systems: NP2 and ADE.)

The Learning Management tools and supporting IT infrastructure must also be modified to support management of training into the Delayed Entry Program, the growing use of demonstration videos, social media, student and learning management for MPTE mobility efforts, gaming and simulation technology as it is brought on-line.

LMS-DL will also introduce the Learning Continuum Pilot, a risk reduction effort that develops proof of concept alignment of sailor training requirements with learning content delivery.

MY NAVY PORTAL (MNP)

MNP is aligned with the single point of entry (SPOE) technology component of the Navy's IT Transformation initiative. MNP is an integrated web portal that consolidates the Navy's Human Resource portals, knowledge, and applications into a single and simplified user experience. Through the use of a multi-phased development approach, MNP will provide an intuitive self-service single point of entry (SPOE) for Sailors to view and manage their personnel and career information. MNP provides Active and Reserve Sailors with personalized interactive experiences and allows access to relevant information including learning content, human resource applications, and career business processes.

ANALYSIS OF ALTERNATIVE/ECONOMIC ANALYSIS (AOA)

The Navy will conduct multiple AoAs and studies to analyze viable alternatives in order to determine the most efficient and effective solution to address the modernization of elements of the Navy's Manpower, Personnel, Training and Education (MPT&E) IT portfolio. AOA will assess operational effectiveness, suitability, and costs of non-tactical systems to meet emerging capability requirements.

NAVY STANDARD INTEGRATED PERSONNEL SYSTEM (NSIPS)(will become NP2)

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013N *I Information Technology Development*

The NP2 increase in FY19 supports the de-customization of the Navy Standard Integrated Personnel System (NSIPS) and integration of Direct to Treasury Pay Capability via Pay Modernization (Pay Mod). This combined effort (named NP2) will result in an integrated, vanilla Commercial Off the Shelf, cloud hosted, integrated personnel and pay solution that will provide the navy with an IT system that is modern, highly automated, auditable, and more efficient. FY19 efforts include:

1. Continuation of the second Field Test including agile development of Treasury Direct Disbursing (TDD) and Active Component / Reserve Component (AC/RC) Permeability.
2. Migration of field test to a secure and accredited commercial cloud hosting solution.
3. Completion of Legacy NES and OPINS consolidation efforts.
4. Integration of Bi-Service PeopleSoft license with NSIPS personnel and pay modernization solution.

A 2015 analysis of alternatives for integration of personnel and pay capabilities recommended the use of Oracle PeopleSoft 9.2 with Global Payroll for achieving the Navy's Personnel and Pay IT needs. Follow-on analysis conducted as part of the MPT&E transformation efforts in 2016 and 2017 indicated that the most cost effective approach to achieving the Transformation goals of modernizing HR Business System IT consistent with industry best practices was de-customization of the Navy Standard Integrated Personnel System (NSIPS) which uses Oracle PeopleSoft as its core technology, integration with Global Payroll, use of General Ledger to maximize auditability and accounting functions and hosting of the integrated solution. This combined effort (named NP2) will result in an integrated, vanilla Commercial Off the Shelf, cloud hosted, integrated personnel and pay solution that will provide the navy with an IT system that is modern, highly automated, auditable, and more efficient.

Implementation of NP2 will result in several key benefits:

1. Improved accuracy and auditability of personnel and pay transactions.
2. Treasury Direct Disbursing eliminating Navy reliance on the sunsetting DJMS system.
3. Improved permeability of Active and Reserve Components to improve accuracy and eliminate delays in pay processing when a member moves between components.
4. Increased automation of common personnel and pay transactions
5. Integration of functionality currently spread across 55 different adhoc and outdated HR Business Systems.

Efforts in FY19 are focused on system development, testing and delivery of core components associated with Military Pay, Personnel Transactions that effect Pay, Auditability, Accounting, and Treasury Direct Disbursement. Beyond F19, development will continue and will bring continued integration of legacy systems such as those used for detailing and distribution, management of Sailor performance, and talent management and matching.

NAVY MANPOWER REQUIREMENTS SYSTEM (NMRS)

NMRS will modernize obsolete software and incorporate a wide array of enhancements (expanded capabilities based on sponsor's approved Functional Requirements Document) of new capabilities in support of Manpower Requirement efficiencies.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013N *I Information Technology Development*

NMRS is a key tool which Navy manpower managers rely on to set, implement, and execute manpower requirements. Recommendations for improving data bases and the Navy's mobilization capacity rely on NMRS to make strength determinations. The planned effort also includes technical evaluation and integration of products produced by the Simulation Toolset for Analysis of Mission, Personnel and Systems (STAMPS) program. As envisioned by the Navy's Transformation initiative, NMRS will eventually be consolidated into the MPT&E Personnel and Pay System technology component of the transformation.

RISK MANAGEMENT INFORMATION (RMI)

The RMI program is a consolidation of DON risk management requirements into a single Program of Record (POR) to provide modern safety reporting and management capabilities for both active and reserve Navy and Marine Corps commands. RMI enables agile responses to business rule changes, automation of routine actions, improved data integrity, and facilitates self-service for organizations and individuals.

RMI is being developed in three increments of capabilities: Streamlined Incident Reporting (SIR), Safety Program Management (SPM), and Analysis & Dissemination (A&D). A fourth requirement, Single Point of Entry (SPOE) integration, will be accomplished as part of the development of the three RMI increments since each will be built on the same Commercial Off The Shelf (COTS) platform. Each of these capabilities will be acquired as individual Abbreviated Acquisition Programs using an incremental development approach for reengineered business processes, while consolidating five legacy systems Web-Enabled Safety System (WESS), Enterprise Safety Application Management Systems (ESAMS), Portsmouth Occupational Accident and Illness Reporting System (POAIRS), Medical Mishap and Compensation (MMAC), and Injury Tracker (INJTRK).

AUTHORITATIVE DATA ENVIRONMENT (ADE)

ADE is part of the Navy's MPT&E IT Transformation initiative aligned directly with the Authoritative Data Environment technology component of the transformation. ADE is aimed at transitioning the current project based ADE into a full enterprise solution that is based on modern IT service models and cloud hosting technology. This will advance data analytics and visualization capabilities, and add common platform services in a big data environment that is consistent with private industry. This acceleration toward a true Navy-wide personnel authoritative data environment is a transformational increase in capability for decision support and improving personnel readiness.

As part of the Transformation strategy, the Chief of Naval Personnel has directed expansion and improvements of the ADE in making MPT&E data more available to commanders, sailors, business owners and fleet executive leadership. The ADE provides infrastructure, operations and sustainment of the Navy MPT&E Authoritative Data Warehouse(ADW), enterprise service bus, and web support services.

The capabilities delivered by this funding include:
(1) Completed "golden record" expansion increments
- Data quality
- Governance
- Security

- Data standardization
(2) Increased capabilities for MPT&E supply chain & business operations
- Data discovery
- Advanced visualization tools
- Predictive analytics
(3) Enhanced architecture to support unstructured data and "big data" analytics
(4) Improved support for future identity management & access for mobile device capability

APPLICANT RELATIONSHIP MANAGEMENT (ARM)

ARM provides automated support of the management of recruiting information. ARM enables all levels of recruiting to have real-time access to timely and accurate information. ARM provides managers with decision-making support by consolidating Navy Recruiting Command (NRC) legacy application systems. The complete ARM Systems Dev/Mod effort will incorporate biometrics and paperless implementation across all lines of business systems to gain additional efficiencies.

Included in the ARM program is the Self Service Accessions Application (SSAA). Phase II of this effort will build the SSAA application into the ARM system. SSAA is a mobile device-based software application. SSAA supports a change in the NRC business processes from a recruiter-driven business model to an applicant self-service business model. This "app" will be used by applicants to collaborate with recruiters anytime & anywhere to more efficiently and effectively navigate the recruiting process. As envisioned by the Navy's Transformation initiative, ARM will eventually be consolidated into the SPOE Customer Relations Management (CRM) System.

3167 JOINT TECHNICAL DATA INTEGRATION (JTDI)

JOINT TECHNICAL DATA INTEGRATION (JTDI)
Increased funding for development of JTDI Data Transport Battlegroup Survivability Enhancements ensuring Tech Data is available for fleet users in degraded mode networks or during complete loss of access to land-based top tier servers. It will be used to develop the JTDI Standard Data Repository providing a Big Data Storage and access solution enabling an advanced Enterprise Common CBM+ data analysis solution.
Funding supports the evaluation, testing and integration to develop a JTDI Commercial-Off-The-Shelf (COTS) solution for installation on a Carrier (CV) and Amphibious Assault (L) class ships and up to 104 Navy/Marine Corp aviation activities. JTDI is a digital technical data access, delivery and local O&I level library management toolset and telemaintenance collaboration process enabler. It improves accuracy and timeliness of technical manual and other technical data delivery and minimizes the Fleet's library management burden. JTDI reduces maintenance work hours with saving Return on Investment (ROI) of 2.5:1. It facilitates the transition of the Joint Distance Support and Response (JDSR) Advanced Concept Technology Demonstration (ACTD) for telemaintenance and provides for process efficiencies to support ongoing Aviation Fleet Technical Representative reductions.

MARINE AVIATION LOGISTICS ENTERPRISE INFORMATION TECHNOLOGY (MAL-EIT)
Increased funding to accelerate the deployment of MAL-EIT 3.0 to meet the new deadline of FOC in FY19 as well as begin development of MAL-EIT 3.1.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013N *I Information Technology Development*

Funding supports the evaluation, development, testing and integration of software and hardware solutions across all US Marine Corps Aviation activities to be used in the planning and execution of geographically distributed, expeditionary Aviation Logistics (AVLOG) chains in support of deployed USMC Air Combat Element operations. The Marine Aviation Logistics Enterprise Information Technology (MAL-EIT) Program is one of four programs contained within the Marine Aviation Logistics Support Program (MALSP) modernization program known as MALSP II. Legacy MALSP is nearly 25 years old and grossly inadequate in IT capability to meet the informational, planning, and C2 needs of a dynamic, geographically distributed nodal AVLOG system. MAL-EIT is a Defense Business System Abbreviated Acquisition Program that will develop and deliver the required IT capability necessary to eliminate the IT related gaps existing in the legacy MALSP.

3185 JOINT AIR LOGISTIC INFORMATION SYSTEM (JALIS)

JALIS is an operational scheduling and aircraft management system that facilitates real-time data analysis. JALIS is a critical element in the management of DoD air logistics assets. JALIS allows:

(1) DoD Service Personnel to submit airlift requirements for DoD Personnel and cargo
(2) Air Logistics Flying Units to communicate their aircraft availability in a real-time graphic display
(3) Designated Scheduling Organizations to compare airlift requirements with available aircraft
(4) Designated Scheduling Organizations to create mission assignments

JALIS informs applicable users of mission details and modifications by using a combination of system displays and email updates. JALIS is geographically distributed and has a user base in excess of 4,000 members. JALIS facilitates the movement of thousands of DoD Personnel and tons of cargo annually in support of the following:

(1) Navy Unique Fleet Essential Airlift
(2) Army's Operational Support Airlift Agency (OSAA)
(3) United States Transportation Command (USTRANSCOM)
(4) United States Marine Corps (USMC)

9406 MAINTENANCE DATA WAREHOUSE
The Aviation Logistics Environment (ALE) program is the Naval Aviation Information Technology (IT) solution to deliver full lifecycle weapon system logistics and maintenance capabilities to the functional Naval Aviation Support Process (NASP). It will deliver these capabilities via a net centric, shared data environment that supports shore based, afloat, and expeditionary operations. The ALE integrates IT services plane-side and interfaces with infrastructure systems where necessary. ALE is a major logistics enterprise solution and a part of the total enterprise solution architecture. ALE is designed to structure IT services so that they can connect with other parts of the enterprise solution set, thus enabling an interoperable end-to-end business process. ALE consolidates Naval Aviation data into an integrated data environment for high level analysis. The purpose of ALE is to integrate, organize, and develop an underlying infrastructure and analytical capacity across the NASP in order to generate a holistic timely picture of readiness and condition for all T/M/S. ALE will be providing modern Product Lifecycle Management (PLM), Decision Support (Predictive Analytics), Planeside Interfacing, and the Enterprise Infrastructure to support the NAE. The ALE program is a "system of systems" that will provide a common, integrated data environment that will enable NAE Vision 2020 data transparency across the Naval Aviation Enterprise; end-to-end process view to enable

both consuming and providing on-demand information to stakeholders; a capability to view "digital twins" of all T/M/S for both allowable and as-configured states; a consolidation of aging, near-end-of-life systems and applications to modern technology and cost efficient support infrastructures; consistent and accurate weapons systems technical and CAD engineering documentation to support additive manufacturing capabilities; standardized metrics, algorithms, and business analysis tools; an architecture that enables migration to the cloud; and alignment to Information Assurance (IA) and Cybersecurity standards, and Risk Management Framework (RMF) compliance.

Vector (formally Integrated Logistics Management System (ILSMS)) supports the development of a common logistics analytical application that uses disciplined approach to Business Intelligence (BI) architecture that combines products, technology and methods aimed at key Naval Aviation Enterprise (NAE) business processes providing a single data source which focuses on aircraft readiness, maintenance, supply, cost, and man-hours. Vector provides naval aviation with a common source for approved key performance metrics and the capability to perform multi-system analysis of Ready for Tasking (RFT)/Ready Basic Aircraft (RBA) Gap drivers, 'Top-Down' aircraft systems analysis down to the component level, and identifies system performance trends early to mitigate future readiness and cost impacts to the fleet.

Dynamic Scheduling optimizes aircraft (BuNo specific), engine and component maintenance through task sequencing based on reliability and failure data, and asset utilization vice calendar directed maintenance. Aviation Logistics Environment (ALE) reduces ~33 disparate IT systems into a single unified governance ecosystem, and allows for modernization of existing software, hardware, and infrastructure in order to improve cyber readiness and support aircraft and weapons logistics information exchange requirements. Establishment of ALE provides the NAE one common Logistics IT solution for readiness reporting and maintenance at a reduced sustainment cost.

CONDITION BASED MAINTENANCE PLUS (CBM+)
Through automated analysis and decision making processes, the CBM+ Initiative provides Naval Aviation Enterprise with common enabling capabilities which deliver timely data-driven decisional information to optimize aircraft availability and materiel readiness by incorporating health and usage leading indicators into the failure mode mitigation process, enabling the Warfighter to more efficiently meet mission requirements. The CBM+ Initiative increases readiness by streamlining maintenance processes, provide the sustainment base with timely, actionable logistics data not previously available, and enable engineers and acquisition professionals to support system improvements based on CBM+ acquired data results. CBM+ provides the enabling solutions needed to extend the life of current and new acquisition aircraft, realizing savings from reductions in field (organizational and intermediate) maintenance actions, reduced functional check flight hours, mishap mitigation, and reduced parts usage.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605013N *I Information Technology Development*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	97.066	152.977	168.639	-	168.639
Current President's Budget	87.469	152.977	268.567	-	268.567
Total Adjustments	-9.597	0.000	99.928	-	99.928
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.082	0.000			
• Program Adjustments	0.000	0.000	102.194	-	102.194
• Rate/Misc Adjustments	0.000	0.000	-2.266	-	-2.266
• Congressional General Reductions Adjustments	-0.015	-	-	-	-
• Congressional Directed Reductions Adjustments	-6.500	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by $19.023 million to account for the availability of prior year execution balances

Technical: Not applicable.

Schedule Change: 2901, Electronic Procurement System, Contract Writing System award date shifted from Q4 FY18 to Q2 FY19 due to delay in the Request For Proposal (RFP) release that incorporated requirements changes associated with cloud hosting.

Funding increases addressed within individual projects.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*				Project (Number/Name) 2901 / *AAUSN IT*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2901: *AAUSN IT*	46.521	14.704	17.530	34.682	-	34.682	39.230	22.229	5.745	2.287	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

DON/AA IT Modernization (formerly AA USN IT)

SYSTEM MODERNIZATION & ANALYTICAL TOOLS: The Secretariat Automated Resources Management Information System (SARMIS) is a financial tool used by the Secretariat to formulate, execute, and report changes to organizational resources. DON/AA employs this system to support financial and resource decisions for all Secretariat activities. SARMIS produces budget materials and analysis, as well as generating allocation data. In addition, SARMIS contains organizational manpower data that assists our leaders in making necessary personnel decisions for the Secretariat. The SARMIS application is currently operating on a severely outdated and underperforming platform. This results in additional administrative overhead, error corrections, and development fixes to maintain current operations. This RDTEN funding is used to upgrade this critical software capability to a new platform, comply with mandatory DOD cyber security requirements, and develop new reporting and integration capabilities.

ASN(M&RA) IT System Modernization for BCNR:
The CAPS-II, CRSC, and BCNR programs are used by the Navy Clemency and Parole Board (NCPB), the Combat Related Special Compensation Board (CRSC), and the Board of Corrections of Naval Records (BCNR) to process and adjudicate approximately 17,200 cases per year. The current system defects have resulted in additional man-hours and reduced reporting functionality. This has created a longer manual process and hinders adequate statistical data from being retrieved. As a result, congressional inquiries take longer to satisfy and accuracy cannot be guaranteed. RDTEN funding will be used to redevelop systems for the CAPS-II, CRSC, and BCNR in order to meet reporting requirements, enhance system capabilities, and gain compliance with current IT standards.
DON TRACKER

Department of the Navy Tasking, Records and Consolidated Knowledge Enterprise Repository (DON TRACKER - formerly known as Enterprise Records and Task Management (ERTM)) is a single, auditable, compliant Records and Task Management process, implemented uniformly across all DON Divisions and Commands, and administered by DON/AA, to enable efficient and effective execution of Records Management (RM) and Task Management (TM) policy in compliance with statute.

ELECTRONIC PROCUREMENT SYSTEM (ePS)

The increase from FY18 to FY19 supports the start of the Limited Deployment (LD) phase of the ePS program and software hosting. Limited deployment includes contract award in January 2019, originally scheduled for end of FY18. Funding profile has been adjusted to account for shift in award date. Additional efforts associated with LD include software configuration, software installation, test and evaluation, data migration, interface development, and gap closure.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

The electronic Procurement System (ePS) is the Department of the Navy's (DON) End-to-End (E2E) Contract Writing System (CWS). It will provide the Navy and Marine Corps contracting community with a full contract writing management capability and facilitate integration with federally mandated systems, DON financial systems, and industry. The ePS will utilize Department of Defense (DoD) standards and support auditability. The ePS will address existing CWS challenges including outdated architecture, limited capabilities, scalability concerns, and existing legacy systems.

Full deployment of the ePS ensures compliance of the DON's contracting abilities with the following legislative mandates: the writing and management of all contracts must now occur in congressionally approved computer systems (Section 862 of the National Defense Authorization Act (NDAA) of 2013); the central management and oversight of all DoD business (10 U.S. Code (U.S.C.) Section 2222); and all contracting actions must be fully auditable and traceable (Section 1003 of the NDAA 2010 & Office of the Secretary of Defense (OSD) Financial Improvement and Audit Readiness (FIAR) Guidance).

The ePS will use DoD data exchange capabilities (e.g.; Procurement Data Standard (PDS) and Purchase Request Data Standard (PRDS)) in order to achieve standardized data interoperability with external systems. The Navy Enterprise Service Bus (NESB) serves as the hub to relay procurement data to various finance and other systems of record, such as Navy Enterprise Resource Planning (Navy ERP), Standard Accounting & Reporting System (STARS) and Standard Accounting Budgeting & Reporting System (SABRS).

The result of successful ePS implementation will be a contracting workforce that issues accurate and timely contracts in a standard format that comply with all DoD/ Federal laws, regulations, and policies.

NMCI ENTERPRISE SERVICE TOOLS(NEST)

The increase from FY18 to FY19 is due to the following major efforts: the Middleware Implementation, CDR Integration Implementation and ITPR/Demand Management. These efforts are focused on providing continuity of IT service lifecycle management processes during the transition from NGEN contract to NGEN-R contract(s).

The NMCI Enterprise Service Tools (NEST) is the NMCI IT service management system that supports the Navy IT service lifecycle business workflow. The NEST currently is comprised of two government owned tools, the NMCI Enterprise Tool (NET) and the Requirements to Award Process Tool (RAPT), which enables and manages the business workflow. NET is a custom NET application that has been built and maintained by the DON to support ordering of IT services. RAPT manages the requirements approval process and stores supporting documentation for previously un-priced line items. RAPT provides NET with relevant identification information for the new orderable solution, which supports the creation of orderable services. NET serves as the single point of entry for lifecycle management of IT services on the NMCI network.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CORB IT System Moderization	0.500	0.000	1.058	0.000	1.058
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: CORB's eCase IT system replaces out-of-date systems and furthers CORB's digitization effort. The CAPS-II, CRSC, and BCNR programs are used by the Navy Clemency and Parole Board (NCPB), the Combat Related Special Compensation Board (CRSC), and the Board of Corrections of Naval Records (BCNR) to process and adjudicate approximately 17,200 cases per year. The current system defects have resulted in additional man-hours and reduced reporting functionality. This has created a longer manual process and hinders adequate statistical data from being retrieved. As a result, congressional inquiries take longer to satisfy and accuracy cannot be guaranteed. ***FY 2018 Plans:*** No funding planned for FY 2018. ***FY 2019 Base Plans:*** RDTEN funding will be used to redevelop systems for the CAPS-II, CRSC, and BCNR in order to meet reporting requirements, enhance system capabilities, and gain compliance with current IT standards. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase for the redevelopment of systems for CAPS-II, CRSC, and BCNR in order to meet reporting requirements, enhance system capabilities, and gain compliance with current IT standards.					
Title: Modernization - Secretariat	1.116	0.703	0.400	0.000	0.400
Articles:	-	-	-	-	-
Description: The Secretariat has numerous requirements to modernize its financial management system and portal applications. SARMIS will be updated from older technologies to include new FIAR and web based requirements. These upgrades are necessary to continue functionality of the system and ensures timely, accurate and efficient operation of the Secretariat's mission. ***FY 2018 Plans:*** Continue with FY2017 modernization and design effort. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete modernization effort. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding supporting two modernization projects -- Secretariat and CORB IT System -- were reprioritized to meet planned project schedule. Funding from Secretariat modernization project effort was realigned to CORB IT System project.					
Title: Department of the Navy Tasking, Records and Consolidated Knowledge Enterprise Repository (DON TRACKER) ***Articles:*** ***Description:*** The DON TRACKER will streamline DON's electronic records and task management processes under a consolidated enterprise solution and will enable the DON to capture unstructured and structured electronic records, seamlessly manage tasking across and within all commands, ensure uniform metadata of content, provide workflow-enabled reporting, and aid in compliance with all applicable laws, policies, and regulations. In addition, this will eliminate duplicative capabilities and result in cost-saving opportunities and efficiencies. The DON TRACKER solution will be extended to all authorized, shore and afloat-based users across the DON enterprise, including the Continental United States (CONUS) and Outside the Continental United States (OCONUS) communities. ***FY 2018 Plans:*** 1. Conduct Production Readiness Review for DON TRACKER v1.4 2. Begin Deployment ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY18 to FY19 decrease of $465K due to the full deployment of the DoN Tracker capability in FY19.	0.577 -	0.465 -	0.000 -	0.000 -	0.000 -
Title: NMCI Enterprise Service Tools (NEST) ***Articles:***	0.000 -	5.200 -	6.880 -	0.000 -	6.880 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: The NMCI Enterprise Service Tools (NEST) is the NMCI IT service management system that supports the Navy IT service lifecycle business workflow. The NEST comprises two government owned tools, the NMCI Enterprise Tool (NET) and the Requirements to Award Process Tool (RAPT), which enables and manages the business workflow. NET is a custom NET application that has been built and maintained by the DON to support ordering of IT services. RAPT manages the requirements approval process and stores supporting documentation for previously un-priced line items. RAPT provides NET with relevant identification information for the new orderable solution, which supports the creation of orderable services. NET serves as the single point of entry for lifecycle management of IT services on the NMCI network. ***FY 2018 Plans:*** - Conduct configuration and development of NEST Releases to attain the following capabilities: -Integration with Defense Logistics Agency (DLA) and Defense Finance Accounting System (DFAS) via Global Exchange (GEX), invoicing and delivery request, ONE-NET integration - Conduct middleware analysis - Conduct Central Data Repository (CDR) Integration Analysis. - Conduct Integrated Solution Framework (ISF) Tools Requirement Analysis & Implementation. - Conduct DFAS Auditability Analysis & Implementation (Compliance and Continuous Improvement). - Reconfiguration of the NET for compliance with DFAS audit requirements, reconfiguration of the hosting environment from a service hosted enclave to a government approved hosting facility. ***FY 2019 Base Plans:*** - Continue configuration and development of NEST Releases to attain the following capabilities: - integration with Defense Logistics Agency (DLA) and Defense Finance Accounting System (DFAS) via Global Exchange (GEX), invoicing and delivery request, ONE-NET integration - Start middleware integration - Start Central Data Repository (CDR) Integration. - Continue Integrated Solution Framework (ISF) Tools Requirement Analysis & Implementation. - Continue DFAS Auditability Analysis & Implementation (Compliance and Continuous Improvement) (I.e. SLOA, PIID, PDS, WAWF, etc.) - Continue reconfiguration of the NEST for compliance with DFAS audit requirements, reconfiguration of the hosting environment from a service hosted enclave to a government approved hosting facility					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Conduct Analysis & Implementation ITPR/Demand Management - provide an analysis to understand process and tools to manage service requirement demands. Implementation to enable automation of approval business process for all new IT procurement requests. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY18 to FY19 for the NMCI Enterprise Service Tools (NEST) is due to the following major efforts: the Middleware Implementation, CDR Integration Implementation and ITPR/Demand Management. These efforts are focused on providing continuity of IT service lifecycle management processes during the transition from NGEN contract to NGEN-R contract(s).					
Title: Electronic Procurement System (ePS) ***Articles:*** ***Description:*** Funding required for the Electronic Procurement System (ePS) to provide support for source selection, configuration, integration, testing, training, deployment and implementation of the system. ***FY 2018 Plans:*** - Begin Navy Enterprise Resource Planning (ERP) programming changes required for interfacing with ePS. - Conduct Source Selection so that contractor proposals can be evaluated. - Continue NESB data mapping efforts required for ePS Limited Deployment, including sending committed Purchase Requisition (PR) data from additional financial systems (IMPS, PR Builder, and Standard Accounting, Budgeting and Reporting System (SABRS)) to the Electronic Procurement System (ePS); and sending award data from ePS to Navy financial systems (Navy ERP, IMPS and SABRS). - Increase Systems Engineering efforts to include additional data mapping to DON financial systems and data profiling, updating required documentation, updating architecture models, preparing for cyber security requirements, and developing required testing plans. Systems engineering efforts, specifically data mapping, will reduce significantly upon start of limited deployment. - Begin data cleansing and logistics analysis in preparation for data migration from legacy systems into the new ePS solution to reduce the risk of data migration errors. - Continue Project Management efforts including source selection, implementation preparation, scheduling, configuration management, and updating required documentation for Authority to Proceed (ATP) decision. ***FY 2019 Base Plans:***	12.511 -	11.162 -	26.344 -	0.000 -	26.344 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Award the contract to the vendor selected by the Source Selection Authority to begin Limited Deployment. Limited deployment will span across five sites and will include 210 critical users (contracting and grants professionals). Limited deployment will encompass: o Data migration from four systems to one across five databases and five servers o Interface development and testing for four systems (PR Builder, Standard Accounting Budgeting System (SABRS), Navy ERP, and Integrated Management Processing System (IMPS)) o Systems configuration and gap closure to ensure all DON contracting requirements for ePS system are met and a commercially viable solution is provided o Systems engineering o Enterprise architecture support o Quality assurance o Development of training material o Over-the-shoulder support as part of implementation - Continue data cleansing and logistics analysis in preparation for data migration from legacy systems into the new ePS solution to reduce the risk of data migration errors. - Software/cloud hosting (Dev/Test environments) - Conduct the necessary Navy reviews to achieve ATP ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY18 funding focuses on initial systems engineering and efforts associated with the preparation for the Limited Deployment contract award. FY19 funding increase required for significant workload increase associated with execution of the Limited Deployment contract, testing, data migration and hosting.					
Accomplishments/Planned Programs Subtotals	14.704	17.530	34.682	0.000	34.682

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 8106: *Command Support Equipment*	1.875	3.658	2.701	-	2.701	5.815	0.000	0.000	0.000	0.000	14.049

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

D. Acquisition Strategy

The NMCI Acquisition strategy aims to shift the DON to a multi-vendor, multi-contract environment that aims to provide government-owned IT service lifecycle management. The NEST tools are currently being updated to incorporate enhancements that will enable to new environment.
MODERNIZATION - Contract will be awarded under a competitive, all source, RFP. NO ACAT

The selected contractor must have knowledge of the existing information systems pertinent to the task. They must also have the corporate experience and a staff of knowledgeable personnel to provide the required services. The task will be monitored by the Contracting Officer Representative (COR), who reviews technical data submissions, system deliverables, and invoices to ensure acceptable contractor performance and scheduled deliveries.

CORB IT System Modernization:

Contract will be awarded under a competitive, all source, RFP. NO ACAT

DON TRACKER
As a general rule, IT development programs use an agile software development methodology therefore milestones, tasks and phases are often conducted in parallel vice sequentially.

This planned acquisition will be a Cost-Plus-Fixed-Fee (CPFF) single award Indefinite Delivery Indefinite Quantity (IDIQ) contract to a selected Vendor in support of sustainment, software development, legacy data transfer, and additional fielding of the DON TRACKER application.

ELECTRONIC PROCUREMENT SYSTEM (ePS)
The ePS program intends to award a 10-year hybrid contract to a single System Integrator (SI). The SI (Prime) will provide required software licenses and required activities for program management, maintenance, systems engineering, design and interface development, testing, deployment, training, and support documentation. This includes all efforts through Full Deployment (FD) and continued sustainment support during the 10-year period of performance.

The ePS will leverage Commercial Off-the-Shelf (COTS) products and capabilities, and is anticipated to consist of three components to achieve full end-to-end capability: 1) a COTS Contract Writing System (CWS) solution; 2) a COTS middleware interfacing capability, known as an Enterprise Service Bus (ESB); and 3) Gap-closure methodologies (e.g.; Business Process Management (BPM) tools, Business Process Re-Engineering (BPR), COTS updates, or a secondary COTS solution).

E. Performance Metrics

Program cost, schedule and performance are measured using a systematic approach with approved programs and methods. The results of these measurements are presented to DON/AA management through a governance review board process on a regular basis to determine program effectiveness and to provide new direction as needed to ensure the efficient use of

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

resources. To monitor and manage the execution of projects in addition to other IT investments, management and governance boards review metrics and key performance indicators that are outlined in various plans. Some of the plans that expound on the data captured to attribute to performance measures include: Project Management Plan, Risk Mitigation Plan, Communication Plan, Procurement Plan, and a Certification & Accreditation Plan.
Other specific performance measurements include:
1. Actual versus planned project scope
2. Actual versus planned time schedule
3. Actual versus planned costs
4. Actual versus planned risks and the mitigation of those risks

BCNR IT System Modernization specific performance measurements include Navy Clemency and Parole Board (NCPB) and the Combat Related Special Compensation Board (CRSC) which process 17,200 cases per year.
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DON TRACKER
PII-100% of flagged PII shall be protected
Automation-95% of requests will be processed using automated system without a manual workaround
Operational Availability-99% of transactions shall be resolved correctly per System Accuracy definition

ELECTRONIC PROCUREMENT SYSTEM (ePS):
Reliability:
(Threshold) Mean Time Between Failure (MTBF) >= 720 Hours (Hrs)
(Objective) Mean Time Between Failure (MTBF) >= 1080 Hrs

Operational Availability:
(Threshold) = 96% Including Scheduled Downtime
(Objective) = 99.5% Discounting Scheduled Downtime

Maintainability:
(Threshold) Mean Time to Repair (MTTR) <= 6.7 Hrs
(Objective) Mean Time to Repair (MTTR) <= 2.7 Hrs

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development (Modernization)	C/FP	CACI : Chantilly, VA	4.555	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Contractor Engineering Support (DONCJIS)	SS/T&M	Interimage Inc. : Manassas, VA	1.272	0.000		0.000		0.000		-		0.000	0.000	1.272	-
Software Development	C/FP	Dell Marketing LP : Round Rock, TX	1.938	0.000		0.000		0.000		-		0.000	0.000	1.938	-
Software Development (CLEOC)	C/FP	NSA : Various	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
Software Development (EPS)	TBD	NA : NA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
SYSTEM Moderization	WR	SPAWAYSYSCEN ATLANTIC : CHARLESTON, SC	1.834	1.116	Oct 2016	0.703	Oct 2017	0.400	Oct 2018	-		0.400	0.000	4.053	-
CORB SYSTEM Modernization	WR	SPAWASYSTEM : CHARLESTON, SC	0.500	0.500	Oct 2016	0.000		1.058	Oct 2018	-		1.058	0.000	2.058	-
DON TRACKER Engineering	C/CPFF	Progeny : Manassas, VA	5.172	0.577	Feb 2017	0.465	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
ePS Data Transition Strategy	Various	NAVSUP BSC : Mechanicsburg, PA	1.502	0.100	Nov 2016	0.100	Nov 2017	0.000		-		0.000	0.000	1.702	-
ePS NESB Data Mapping	C/FP	BOOZ ALLEN : Tysons Corner, Va	5.400	1.300	Dec 2016	0.450	Dec 2017	0.000		-		0.000	0.000	7.150	-
NESB Configuration and Validation	C/FP	SPAWAR : San Diego, CA	7.371	0.000		0.000		0.000		-		0.000	0.000	7.371	-
Contract Writing System (ePS)	C/FP	TBD : TBD	0.000	0.000		0.000		20.130	Jan 2019	-		20.130	Continuing	Continuing	Continuing
NERP Interface Analysis (ePS)	Various	SPAWAR : San Diego, CA	0.000	1.409	Jul 2017	1.000	Jun 2018	0.000		-		0.000	0.000	2.409	-
		Subtotal	30.044	5.002		2.718		21.588		-		21.588	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Documentation (ePS)	C/IDIQ	MAGA : Washington, DC	3.734	0.000		0.000		0.000		-		0.000	0.000	3.734	-
Cost Analysis (ePS)	C/CPFF	SPAWAR : San Diego, CA	1.045	0.000		0.000		0.000		-		0.000	0.000	1.045	-
Systems Engineering (ePS)	Various	SPAWAR : San Diego, CA/ Charleston, SC	7.464	5.634	Oct 2016	6.020	Oct 2017	2.884	Jun 2019	-		2.884	Continuing	Continuing	Continuing
Logistics Analysis (ePS)	Various	SSC LANT : Charleston, SC	1.204	0.227	Oct 2016	0.230	Oct 2017	0.230	Oct 2018	-		0.230	Continuing	Continuing	Continuing
Requirements Validation (EPS) - Small Business set aside	C/FFP	SPAWAR : San Diego, CA	1.500	0.000		0.000		0.000		-		0.000	0.000	1.500	-
Project Management/ Implementation	Various	Enterprise Horizion : San Francisco, CA	0.000	1.756	Nov 2016	1.780	Nov 2017	0.800	Nov 2018	-		0.800	0.000	4.336	-
ePS Engineering Services - Small Business set aside	Various	Bowhead : Alexandria, VA	0.000	1.170	Jun 2017	1.482	Jun 2018	0.200	Jul 2019	-		0.200	0.000	2.852	-
ePS Testing and Validation/ Architecture Tool	Various	NSWC Dahlgren : Dahlgren, VA	0.000	0.050	Nov 2016	0.050	Nov 2017	0.050	Nov 2018	-		0.050	0.000	0.150	-
System Engineering Support (NEST)	C/CPFF	Deloitte : Rosslyn, VA	0.000	0.000		5.200	Nov 2017	6.880	Nov 2018	-		6.880	Continuing	Continuing	Continuing
		Subtotal	14.947	8.837		14.762		11.044		-		11.044	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing Preparations (ePS)	C/FFP	SSC LANT : Charleston, SC	0.800	0.000		0.000		0.000		-		0.000	0.000	0.800	-
Software Hosting (ePS)	C/FP	SPAWAR : San Diego, CA	0.000	0.815	Sep 2017	0.000		2.000	Jan 2019	-		2.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 2901 / *AAUSN IT*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Testing (ePS)	C/FP	OPTEVFOR : NORFOLK,VA	0.230	0.050	Jun 2017	0.050	Jun 2018	0.050	Jun 2019	-		0.050	Continuing	Continuing	Continuing
		Subtotal	1.030	0.865		0.050		2.050		-		2.050	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ePS Program Support	C/FFP	PEO EIS : Arlington, VA	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
		Subtotal	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	46.521	14.704		17.530		34.682		-		34.682	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

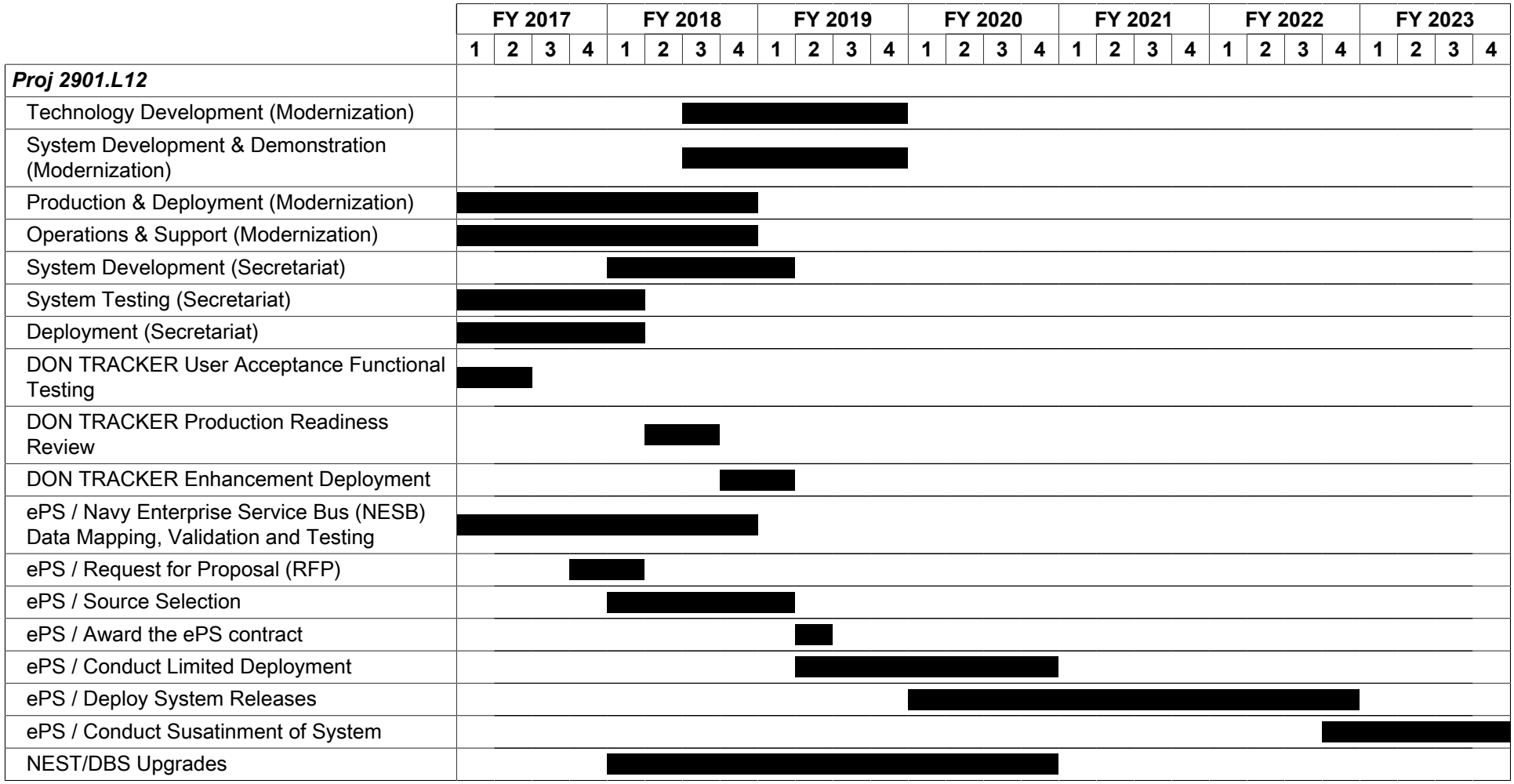


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2901 / *AAUSN IT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2901.L12				
Technology Development (Modernization)	3	2018	4	2019
System Development & Demonstration (Modernization)	3	2018	4	2019
Production & Deployment (Modernization)	1	2017	4	2018
Operations & Support (Modernization)	1	2017	4	2018
System Development (Secretariat)	1	2018	1	2019
System Testing (Secretariat)	1	2017	1	2018
Deployment (Secretariat)	1	2017	1	2018
DON TRACKER User Acceptance Functional Testing	1	2017	2	2017
DON TRACKER Production Readiness Review	2	2018	3	2018
DON TRACKER Enhancement Deployment	4	2018	1	2019
ePS / Navy Enterprise Service Bus (NESB) Data Mapping, Validation and Testing	1	2017	4	2018
ePS / Request for Proposal (RFP)	4	2017	1	2018
ePS / Source Selection	1	2018	1	2019
ePS / Award the ePS contract	2	2019	2	2019
ePS / Conduct Limited Deployment	2	2019	4	2020
ePS / Deploy System Releases	1	2020	4	2022
ePS / Conduct Susatinment of System	4	2022	4	2023
NEST/DBS Upgrades	1	2018	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*				Project (Number/Name) 2903 / *NAVAIR IT*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2903: *NAVAIR IT*	9.689	5.157	10.915	19.144	-	19.144	19.833	7.818	5.660	2.315	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Configuration Management Information System (JCMIS): The JCMIS Program is DoD's standard software system for complete and integrated Configuration Management (CM) of weapon systems from acquisition to disposal. JCMIS efficiently manages all product structure data, including complex interrelationship between assemblies and subassemblies, technical documentation and the parts that comprise the item. JCMIS is designed to manage and control configuration data to support the DoD business processes. Accurate, complete and accessible configuration data is critical to the successful operations of DoD weapon systems or tracked assets. Mission readiness and operational capabilities are enhanced by JCMIS, as instant consistent integrated configuration data is readily available to operators, maintainers and logistics personnel. This system is a CM tool available DoD wide to support all potential customers. JCMIS provides users with a common database infrastructure to ensure compatibility, quality, and consistency of CM processes and provides configuration managers and analysts the validated CM information necessary for accurate maintenance, spare procurements, reliability and safety analysis, and mission readiness. Funding is budgeted to support the services of re-hosting and testing of Commercial off-the-shelf (COTS) upgrades to ensure objective performance of JCMIS is achieved. This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

Task Force Cyber Awakening (TFCA)- Cyber Warfare consists of many different aspects to include sabotage of our weapon systems, networks as well as enablement of missions. Nation and non-nation state actors are acquiring and employing more advanced cyber-attacks in order to exploit our networks and aviation systems challenging our technological edge. The threats and capabilities are real and range from exploiting capabilities, overloading weapons systems and logistics supply chains, to jamming signals or taking control of weapons systems. We must defend against adversarial cyber attacks while contributing to the exploitation of cyber warfare capabilities.

To meet these challenges and address the Chief of Naval Operations priorities and tasking, these R&D efforts are specifically focused on Naval Air Systems Command weapon or control systems and programs to ensure warfighting effectiveness as part of integrated / multi-platform kill chains. These research and development efforts will strengthen our cyber posture by developing research, development, test and evaluation capabilities and solutions to deter, detect, and mitigate cyber threats and safeguard classified naval aviation systems and platforms from "cradle to grave." These solutions will be integrated into the acquisition of weapons systems to enhance security, increase lethality, and improve resiliency in the expected operational environments. Our weapon or control systems are unique in the aforementioned environments and mission, but also in the presence of numerous non-traditional access points and trusted cyber relationships required for operational environments.

Digital Thread - Digital Thread (DT) is digital process integration with complete, secure and authoritative data. DT integrates the product life cycle, and includes all the processes that are needed to design, develop, test, produce, and support a product. By connecting these processes, and using a standardized set of digital tools and data, the DT accelerates the product development cycle and lowers costs for support and new capability integration.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

The Digital Thread solution also includes development and demonstration of cyber security architectures for sustainment information systems, and development of a digital manufacturing data architecture and repository.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JCMIS Annual Software Release	0.693	0.624	0.674	0.000	0.674
Articles:	-	-	-	-	-
FY 2018 Plans: Continue development efforts associated with COTS obsolescence and evolve an open standard interface to other systems. Maintain system compliance with Section 508 requirements. Constantly evolving threats, new vulnerabilities, and changing DON Cyber Security policy require increasingly strong efforts on behalf of JCMIS to ensure that system software and architecture remain secure. Continue generation of solutions and mitigation plans for any vulnerabilities identified during system assured compliance assessment solution scans. Continue monitoring for changes and compliance with applicable security technical implementation guided checklists and security content automation protocol results. Compliance with applicable information assurance updates including information assurance vulnerability alert, information assurance vulnerability bulletin, information assurance vulnerability technical, Microsoft, and supporting software updates. Generation of timely and efficient system and/or software solutions to assist with requests that may involve modification/ update to system software/architecture.					
FY 2019 Base Plans: Maintain existing JCMIS sustainment posture. Continuing to proactively respond to evolving threats, new vulnerabilities, and changing DON Cyber Security policy to ensure adequate continued system software and architecture security posture. Comply with applicable information assurance updates including information assurance vulnerability alerts, information assurance vulnerability bulletins, information assurance vulnerability technical, Microsoft, and all supporting software updates. Continue generation of solutions and mitigation plans for vulnerabilities identified during system assured compliance assessment solution scans. Continue monitoring for changes and compliance with applicable security technical implementation guided checklists and security content automation protocol results as required by security policies. Continue to monitor and ensure Section 508 compliance within system. Continue timely and efficient system and/or software solutions in response to customer/fleet requests that involve modification/update to system software/architecture. Continue necessary development efforts in response to COTS obsolescence scenarios and evolve an open standard interface to other systems as required.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase due to development efforts in response to COTS obsolescence scenarios.					
Title: Task Force Cyber Awakening (TFCA)	4.464	10.291	5.372	0.000	5.372
Articles:	-	-	-	-	-
FY 2018 Plans: - Broad Agency Announcement (BAA) new awards / continuation of development, demonstration and transition of cyber security solutions across 8 identified technology areas. - Augmentation and maturation of lab capabilities across multiple NAVAIR sites to conduct Cyber security RDT&E for NAVAIR programs. - Continued development and maturation of new customized tools, methodologies, and procedures for RDT&E of control system interfaces and penetration testing that tie to identified risk assessment capability gaps and emergent threats. - Continued support of emergent FLTCYBERCOM TASKORDs requiring urgent development of customized control systems solutions for identified Fleet risks. - Increased FY18 Capability investment directly supports emergent intelligence, FCC TASKORDs, Blackbeard AAR, NDAA 1647, Aviation Resiliency and OSD DSB study. Without this capability investment the US Navy will continue to be vulnerable to attacks on its non-traditional systems (e.g., aircraft, weapons, radars, ALRE) and will result in significant residual risk to aviation combat systems. Broad Agency Announcements are in place to execute FY18 funding increases.					
FY 2019 Base Plans: - Broad Agency Announcement (BAA) new awards and continuation for the development, demonstration, and transition of cyber security solutions across 8 identified critical technology areas. - Augmentation and maturation of laboratory capabilities, environments and customized toolsets across multiple NAVAIR sites and facilities to conduct cyber security Research, Development, Test and Evaluation (RDT&E) for NAVAIR programs. - Continued development aviation weapon systems customized tools, methodologies, and procedures identified from Cyber Risk Assessments, Cyber Table Tops, test and evaluation capability gaps and emergent threats. Increased program and Fleet support capability for penetration testing and engineering investigations.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continued support of emergent Fleet Cyber Command/10th Fleet (FLTCYBERCOM/C10F) Tasking Orders (TASKORD) requiring urgent development of customized weapon and control systems solutions for identified Fleet risks. - Increased FY19 capability investment directly supports emergent intelligence, FLTCYBERCOM/C10F TASKORDs, Blackbeard After Action Report (AAR), National Defense Authorization Act (NDAA) 1647 Weapons Systems Evaluations, Aviation Resiliency, incident response investigations, and OSD Defense Science Board Task Force for Cyber Deterrence recommendations. Without this capability investment the US Navy will continue to be vulnerable to attacks on its non-traditional systems (e.g., Aircraft, Weapons, Radars, Aircraft Launch and Recovery Equipment (ALRE)) and will result in significant residual risk to aviation combat systems. Broad Agency Announcements are in place to execute FY19 funding increases. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2018-FY2019 decrease NAWC Support in development aviation weapon systems customized tools, methodologies, and procedures.					
Title: Digital Thread	0.000	0.000	13.098	0.000	13.098
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Establish a production capability to provide maintainers access to the correct digital Configuration Managed Information for faster and more accurate on site execution and to allow for an increase in Readiness managed within the Fleet Community. Utilize a combination of digital demonstration efforts that have been ongoing at Commander Fleet Readiness Centers and Naval Air Warfare Center Aircraft Division to extend those capabilities into a cohesive solution that has implications for I-Level maintainers and serves as a baseline for O-Level engagement. Develop cyber security/data architectures and repository for digital manufacturing data. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase to Digital Thread to establish a production capability to provide maintainers access to the correct Configuration Managed Information for more accurate on site capability enablement and allow for the increase in Readiness managed within the Fleet Community.					
Accomplishments/Planned Programs Subtotals	5.157	10.915	19.144	0.000	19.144

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Joint Configuration Management Information System (JCMIS) Program used Joint Logistics Systems Center (JLSC) funds to evolve JCMIS to Software Release 5.0. In June 1998 JCMIS was transferred to the Navy as executive agent and NAVAIR as program manager. Program Budget Decision 401 transferred joint funding from JLSC to NAVAIR to continue evolving JCMIS. The JCMIS Program Manager continues to evolve the program to keep pace with cost, Military Standards, and evolving commercial standards. Various contractors using competitively awarded contracts have supported the program. Currently, Intergraph Corporation is the JCMIS integration contractor selected through a GSA contract.

Task Force Cyber Awakening (TFCA) - The TFCA strategy is in 3 concurrent steps:
1. Broad Agency Announcements (BAA) for resilient cyber warfare capabilities and control system solutions for NAVAIR Weapon Systems. Draft BAA delineating Naval Research Areas of Interest; Specific Areas of Interest; Technologies Being Sought; Proposal Submission; Proposal Abstracts; Full Proposal; General Information, and Evaluation Criteria.
The objective of the BAA is principally to orchestrate germane research and development to fill the gaps in cyber warfare capabilities for Naval Air Systems Command (NAVAIR) weapon systems, i.e., secure weapon systems able to survive and exploit cyber warfare. Areas of interest include but not limited to:
1) SWaP sensitive cyber resiliency for RTOS and aviation warfare environment
2) Access point identification, prioritization and defense
3) Cyber-Electronic Warfare convergent capabilities
4) Full acquisition cycle cyber security measures
5) Cyber test, inspection, incident response and training tools
6) Cyber warning systems
7) Cyber fault, risk and threat assessment methodologies

2. Stand-up Advanced Cyber Lab (ACL)

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

Achieve capability to respond to cyber incidents, conduct federated avionics penetration tests in support of cyber risk assessments and develop control system solutions for NAVAIR weapon systems and acquisition programs. Stand-up capability to assess BAA solutions. Acquire delineated specialized equipment, software tools, space, power, cooling, and security.
1) Secure Messaging - Cryptography, Steganography, etc.
2) Embedded Operating System Threat Assessment, Software Reverse Engineering, Federated Penetration Testing of Custom Control Systems
3) Advanced Anti-tamper, Digital Forensics
4) Microelectronics Reverse Engineering
5) Capabilities in response to Denial of Service, Precision Direct Attack/ Root Kits, Interdiction / Data in transit and Infrastructure / SCADA attacks.
6) Portable Assessment and Test

3. Organic Cyber Solutions for NAVAIR Customized Control Systems
Project investigation and development or tools and tailored solutions for our control systems and improve the cyber security at control system entry points will be completed. Areas discovered include but are not limited to:
1) Intrusion Detection / Prevention Systems (IDS/IPS) for Real Time systems
2) Live-CD boot
3) Out of Band Monitoring & Authentication
4) Weapon System of Systems Architecture tools
5) Avionics Fuzzing
6) Federated Penetration Testing Tool Set & Non-Destructive Inspection Tool
7) Dynamic Network Maneuvering
8) Weapon System Side Channel Analysis

Digital Thread - Digital Thread Cyber Security Architecture and Strategy
1) Develop cyber security architecture standards for NAE Digital Thread including demonstration plan
2) Develop and demonstrate digital manufacturing data architecture standards that support digital manufacturing capabilities including design, manufacturing, and materials data.
3) Execute cyber security demonstrations for NAE Digital Thread including COMFRC, Logistics IT, PMAs
4) Stand up developmental digital manufacturing data repository that can be integrated into COMFRC, Logistics IT , and PMA systems

E. Performance Metrics

Joint Configuration Management Information System (JCMIS) - Milestone C Spiral Development:
1. During the life of the contract verify conformance with agency specific information processing standards and functional requirements. Prior to delivery of enhanced software, demonstrate the operational capability of the system software. Functionality of the software must meet required systems architecture and processing capabilities. All requirements mandated by law or regulation must be 100% compliant. Independent Verification and Validation will be used for testing new releases of software to determine that previous functionality is maintained. Customer satisfaction will be measured through limited validated customer complaints, feedback, and surveys.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

Task Force Cyber Awakening (TFCA):
1. Establish Broad Agency Announcements (BAA) for Resilient Cyber Warfare Capabilities for Naval Air Systems Command Weapon Systems: Receive responses that address at key areas of interest.
2. Stand-up Advanced Cyber Lab: Operating capability workstations and inter agency task team.
3. Organic Cyber Solutions for NAVAIR Control Systems: Complete all projects.

Digital Thread:
During execution of the funding the following will be used to validate the performance:
1) Contract performance to plan and on time delivery of all contract deliverables
2) Completion of NAE Digital Thread environment Standup FY16-FY18
3) Execution of NAE Digital Thread Demonstrations
4) Execution of Digital Thread Cyber Security architecture demonstrations
5) Standup of developmental digital manufacturing data repository

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 2903 / *NAVAIR IT*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Solutions for Cyber Warfare Capabilities for Task Force Cyber Awakening	Various	Various : Various	4.725	3.294	Oct 2016	4.200	Oct 2017	2.147	Oct 2018	-		2.147	Continuing	Continuing	Continuing
Solutions for Digital Thread	Various	Various : Various	0.614	0.000		0.000		9.500	Oct 2018	-		9.500	Continuing	Continuing	Continuing
		Subtotal	5.339	3.294		4.200		11.647		-		11.647	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Support for Joint Configuration Management Information System (JCMIS)	C/FFP	NAVSUP : Mechanicsburg, PA	1.869	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Support for Joint Configuration Management Information System (JCMIS)	C/FFP	Wyle : Lexington Park, MD	0.313	0.549	Mar 2017	0.480	Mar 2018	0.506	Mar 2019	-		0.506	Continuing	Continuing	Continuing
		Subtotal	2.182	0.549		0.480		0.506		-		0.506	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support for Joint Configuration Management Information System (JCMIS)	WR	NAWCAD : Patuxent River, MD	0.781	0.144	Dec 2016	0.147	Dec 2017	0.168	Dec 2018	-		0.168	Continuing	Continuing	Continuing
Systems Engineering Support for Task Force Cyber Awakening	WR	NAWCAD : Patuxent River, MD	1.100	1.170	Oct 2016	3.438	Oct 2017	1.937	Oct 2018	-		1.937	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

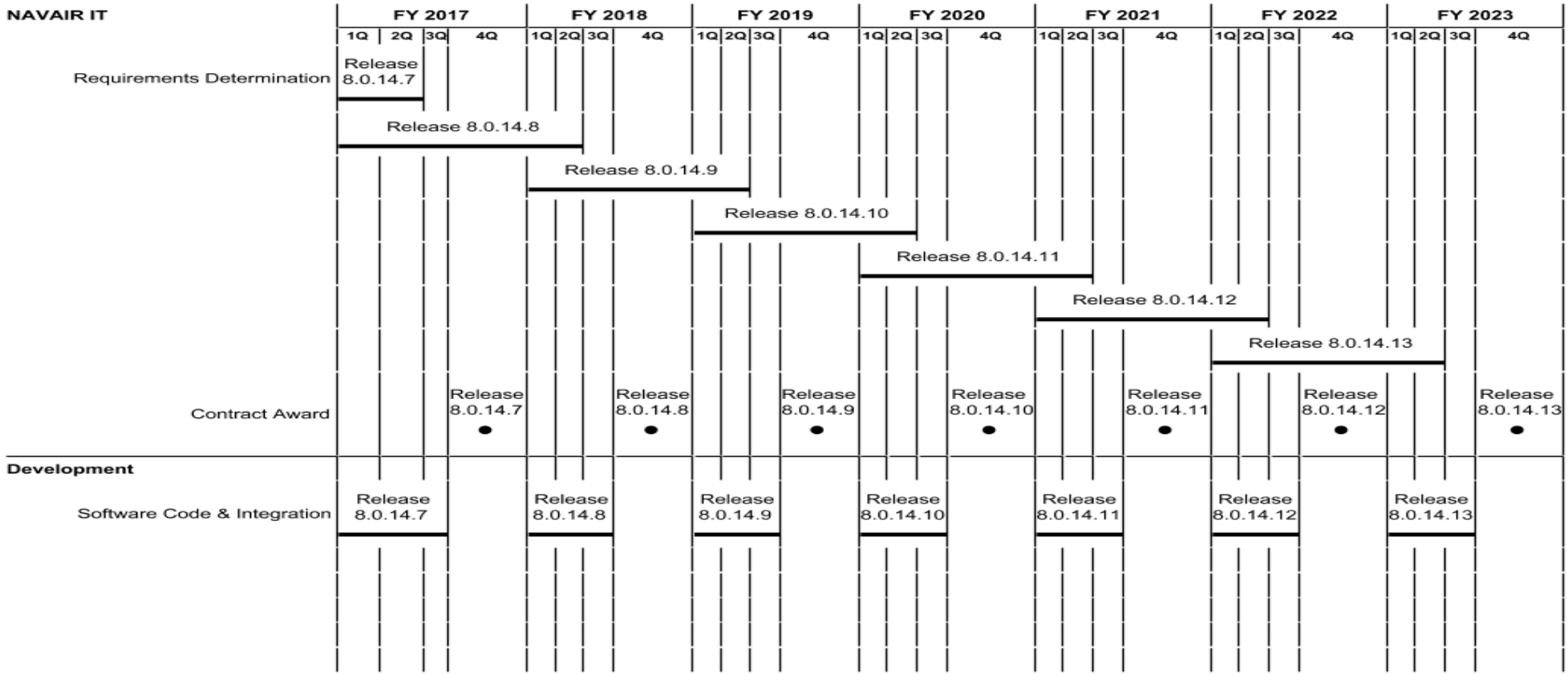
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support for Digital Thread	WR	NAWCAD : Patuxent River, MD	0.287	0.000		0.000		3.526	Oct 2018	-		3.526	Continuing	Continuing	Continuing
Systems Engineering Support for Task Force Cyber Awakening	WR	NAWCWD : China Lake, CA	0.000	0.000		2.650	Oct 2017	1.360	Oct 2018	-		1.360	Continuing	Continuing	Continuing
		Subtotal	2.168	1.314		6.235		6.991		-		6.991	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	9.689	5.157		10.915		19.144		-		19.144	Continuing	Continuing	N/A

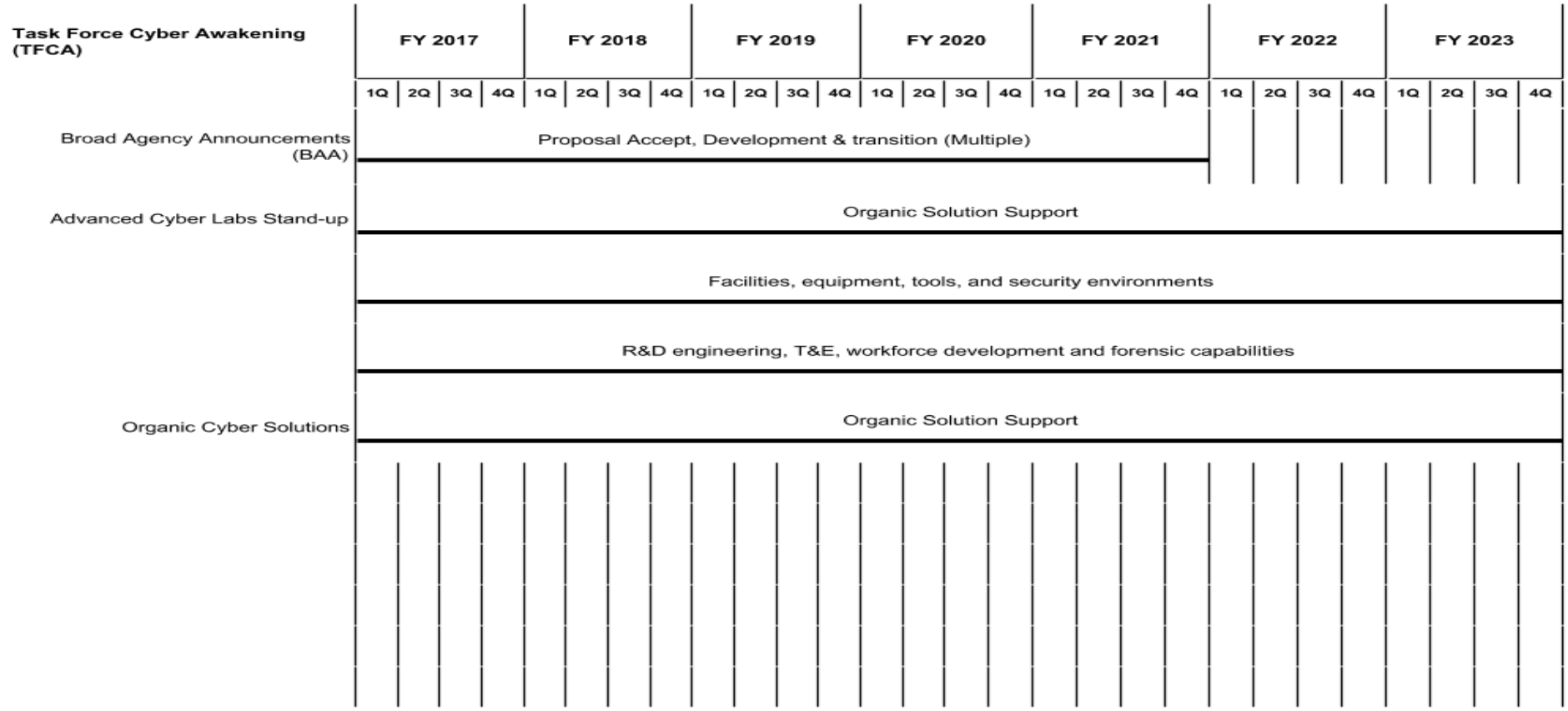
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*



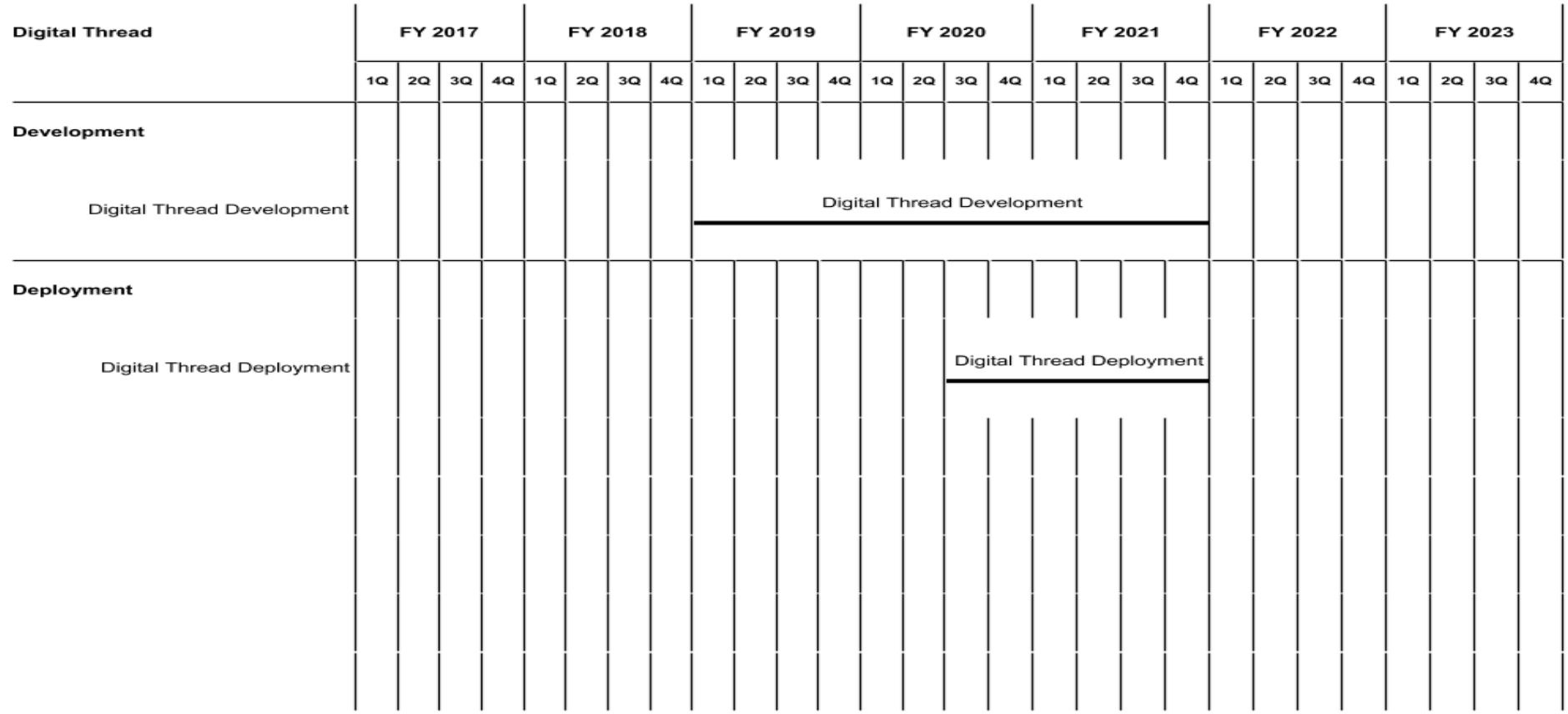
2019OSD - 0605013N - 2903

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*



2019OSD - 0605013N - 2903

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*



2019OSD - 0605013N - 2903

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NAVAIR IT				
Requirements Determination: Release 8.0.14.7	1	2017	2	2017
Requirements Determination: Release 8.0.14.8	1	2017	2	2018
Requirements Determination: Release 8.0.14.9	1	2018	2	2019
Requirements Determination: Release 8.0.14.10	1	2019	2	2020
Requirements Determination: Release 8.0.14.11	1	2020	2	2021
Requirements Determination: Release 8.0.14.12	1	2021	2	2022
Requirements Determination: Release 8.0.14.13	1	2022	2	2023
Contract Award: Contract Award, Release 8.0.14.7	4	2017	4	2017
Contract Award: Contract Award, Release 8.0.14.8	4	2018	4	2018
Contract Award: Contract Award, Release 8.0.14.9	4	2019	4	2019
Contract Award: Contract Award, Release 8.0.14.10	4	2020	4	2020
Contract Award: Contract Award, Release 8.0.14.11	4	2021	4	2021
Contract Award: Contract Award, Release 8.0.14.12	4	2022	4	2022
Contract Award: Contract Award, Release 8.0.14.13	4	2023	4	2023
Development: Software Code & Integration: Release 8.0.14.7	1	2017	3	2017
Development: Software Code & Integration: Release 8.0.14.8	1	2018	3	2018
Development: Software Code & Integration: Release 8.0.14.9	1	2019	3	2019
Development: Software Code & Integration: Release 8.0.14.10	1	2020	3	2020
Development: Software Code & Integration: Release 8.0.14.11	1	2021	3	2021
Development: Software Code & Integration: Release 8.0.14.12	1	2022	3	2022
Development: Software Code & Integration: Release 8.0.14.13	1	2023	3	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2903 / *NAVAIR IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Task Force Cyber Awakening (TFCA)				
Broad Agency Announcements (BAA): Proposal Acceptance, Development & transition (Multiple)	1	2017	4	2021
Advanced Cyber Labs Stand-up: Support Organic/BAA/industry solutions	1	2017	4	2023
Advanced Cyber Labs Stand-up: Facilities, equipment, tools, and security environments	1	2017	4	2023
Advanced Cyber Labs Stand-up: R&D engineering, T&E, workforce development and forensic capabilities	1	2017	4	2023
Organic Cyber Solutions: control systems solution development and evaluation	1	2017	4	2023
Digital Thread				
Development: Digital Thread Development: Digital Thread Development	1	2019	4	2021
Deployment: Digital Thread Deployment: Digital Thread Deployment	3	2020	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 2904 / *NAVSEA IT*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2904: *NAVSEA IT*	155.226	26.018	64.233	37.855	-	37.855	22.613	20.663	11.934	16.134	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Navy Maritime Maintenance Enterprise Solution (NMMES) is the Information Technology toolset currently utilized to execute ship and submarine maintenance in the Naval Shipyards (NSY), Regional Maintenance Centers (RMC), Ship Repair Facility (SRF), Intermediate Maintenance Facilities (IMF), and commercial industrial sites worldwide. These maintenance activities support Fleet operations 24 hours per day, 7 days per week. The NMMES IT solution is used by over 40,000 civilians and military who conduct over $6.5B of ships maintenance and modernization on an annual basis. The NMMES program includes sustainment as well as multiple modernization efforts to insure the continued effectiveness of the Fleet maintenance IT toolset. These efforts consist of adding mandatory enhancements, such as Financial Audit Improvement Readiness (FIAR) changes and aligning with the Standard Accounting Budget Reporting System (SABRS) system. The NMMES program provides for software changes, retiring and/or replacing of costly legacy systems, transition planning, and systems engineering for integration with existing and future solutions. These efforts align with direction to insure that proposed interim solutions support and facilitate the transition to the planned maintenance solution end state. This program will provide modernization, migration, testing, and consolidation of obsolete legacy systems to the next generation of centrally hosted tools supporting Fleet Maintenance systems for the Navy.

The NMMES-TR program and budget was moved to new PU 3432 within PE 0605013N starting in FY 2019 as a result of designation as a Business System Category 1 acquisition program.

Funding for NMMES PU 2904 addresses critical deficiencies and minimizes the inherent risks that a catastrophic systems failure would be to fleet readiness. The increase in funds is required to support the modernizations of products that are on outdated software and to enhance the existing applications to make them cloud capable. It also provides for software enhancements required to make applications Financial Improvement and Audit Readiness (FIAR) compliant and to enable system modifications of financial feeder applications to interface with a FIAR compliant system of record. The requirement to handle 3-D integrated product models being delivered with CVN-78, Virginia Class and Columbia Class are also driving the increase. NAVSEA plans to execute these funds primarily through a current sustainment contract and several separate contracts through existing delivery orders to gain the specialized resources and material necessary to sustain these vital systems until spiral deployment of the NMMES Technical Refresh (TR) solution. The Workforce Management and Financial Management systems were removed from the NMMES TR scope by the Analysis of Alternative (AoA) Preferred Alternative, and will continue operation and sustainment as part of the NMMES portfolio. There is an overlapping period of time where both solutions are operating and requiring sustainment, hence the increase in the requested amounts for current systems and subsequent replacement system(s). The NMMES-TR program and budget was moved to new PU 3432 starting in FY 2019 as a result of designation as a Business System Category 1 acquisition program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Project Sequencing & Scheduling (PSS) Upgrade	0.500	2.500	1.000	0.000	1.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
Description: The PSS scheduling system provides the naval shipyards (Portsmouth Naval Shipyard, Puget Sound Naval Shipyard & IMF, Pearl Harbor Naval Shipyard & IMF, and Norfolk Naval Shipyard) with a customized, flexible scheduling tool for CNO availabilities and other maintenance, repair and overhaul work assigned to the activities. Key system objectives include: 1) Standardization of the scheduling processes and tools; 2) Creation of dates for use in the NMMES project management software; 3) Generation of user and management reports covering all aspects of scheduling of a ship or submarine availability. The current PSS application is based on a 1980s proprietary commercial product originally acquired over 25 years ago. The application is outdated and the vendor has informed the Navy that it will no longer be supported in the near future requiring Navy to pursue an immediate upgrade to a supportable product, while not interrupted maintenance availabilities. The product had already become increasingly difficult to maintain and with the pending loss of vendor support could lead to catastrophic system failure and loss of ability to maintain project schedules. The PSS Upgrade will convert the system from the Robbins-Gioia CAT proprietary solution to the Robbins-Gioia Jaguar 2020 (J2020) solution and improve the web-basing of the system. ***FY 2018 Plans:*** Complete the Scheduling Improvement Analysis to insure that the design modifications required for the J2020 product fully align with the other NMMES Family of Systems and is compliance with NEDC requirements. Following the completion of analysis perform the necessary software configuration and integration of the J2020 product with the NMMES Family of Systems and begin Government Acceptance Testing (GAT) of the product. ***FY 2019 Base Plans:*** Complete GAT of the product and conduct implementation and training of the user community in the use of the PSS Upgrade. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease reflects project deployment schedule.					
Title: electronic Technical Work Document (eTWD)	12.602	10.500	7.031	0.000	7.031
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: The eTWD Initiative is a NAVSEA Sponsored, CNO approved Reduction in Total Ownership Cost (RTOC) Initiative to establish interactive electronic Technical Work Document (eTWD) capability for use in the naval shipyards. An eTWD will be used to execute maintenance, repair, overhaul and modernization work packages on ships and submarines undergoing major availabilities in naval shipyards. This solution will provide paperless work packages, pulling authoritative data from the existing NMMES Family of Systems supporting ship maintenance. The interactive electronic work instruction will be used at the jobsite replacing the current paper driven instructions. The overall goal for eTWD is twofold: 1) to reduce the resources and time preparing, executing and certifying work instructions; and 2) enable the non-stop execution of work by having online documents and accessible for problem resolution. The eTWD Initiative is in progress. ***FY 2018 Plans:*** Complete the software development and configuration of the eTWD capability. Conduct formal Government Acceptance Testing of the software and validate that the changes made to the current solution are acceptable and working properly. ***FY 2019 Base Plans:*** Complete the pre-deployment planning and training necessary to begin implementation in a Naval shipyard. Following stabilization of eTWD operation of first naval shipyard deployment, continue implementation at the remaining naval shipyards. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease reflects project deployment schedule.					
Title: Planned Maintenance System (PMS) Upgrade	0.644	3.128	1.309	0.000	1.309
Articles:	-	-	-	-	-
Description: The Planned Maintenance System Management Information System (PMSMIS) is a web solution that tracks the status of all Maintenance Index Pages (MIPs) and Maintenance Requirements Cards (MRCs) including new and revised documentation, allows for Technical Feedback Report (TFBR) generation and tracking from initial reporting to problem resolution, management of activity documentation distribution information, document development history including Reliability-Centered Maintenance (RCM) information and other data needed to support all forms of planned maintenance in the Fleet. The existing process requires					

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
excessive sailor and shore expert administrative burden, creates complex and ambiguous documents that can be difficult to follow, takes too long to implement changes, leads to equipment maintenance not being properly executed, and lacks tools for leadership to monitor program implementation and assure satisfactory performance. Furthermore, the existing process does not support distributed and optimally-manned ship concepts of operation, such as those now used by the Naval Expeditionary Combat Command and the Littoral Combat Ship. The future PMS Upgrade will also provide visibility to shore maintenance leaders to ensure equipment is consistently scheduled throughout the fleet and to identify execution issues. ***FY 2018 Plans:*** Complete detailed market analysis, and begin design appraisals to align replacement solution with other maintenance products. Begin acquisition and software development. ***FY 2019 Base Plans:*** Complete software design and/or configuration of PMS Upgrade and conduct Government Acceptance Testing (GAT), while planning for deployment and implementation. Once deemed acceptable, begin user community training aligned with implementation and deployment plan. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease reflects project deployment schedule.					
Title: Strategic Planning &Forecasting (SPF) Upgrade	0.103	4.000	1.755	0.000	1.755
Articles:	-	-	-	-	-
Description: SPF is part of a suite of tools in the NMMES Family of Systems that are utilized to assist Navy industrial activities in resource planning and long term workload forecasting to meet CNO strategic maintenance requirements through the gathering and compiling of workforce data. Two additional systems; 1) Performance Measurement and Control (PMC) and Quality Performance System (QPS) are interfaced with SPF to produce the staffing, planning and performance measurement analysis necessary to successfully accomplish work in navy industrial activities. All three of these systems have known software deficiencies which limit productivity and require cumbersome manual workarounds. Historically to effectively operate and meet mission needs, the naval shipyards and RMCs have supplemented this suite with additional local spreadsheet and databases, adding to the complexity of replacing this aging solution. One goal of the SPF Upgrade is to eliminate these ad hoc databases and unify the solution to effectively operate in the targeted navy data center environment.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The SPF Upgrade is part of the Service Life Extension that will address the accumulation of significant problems with this system, update the software platform, provide integrated metrics capabilities across naval shipyards and include accessibility of data by planners at headquarters. The SPF Upgrade will modernize the database architecture to provide fully functioning data warehouse environment that will eliminate the weekend long running of PMC jobs that hinders efficiency and productivity. The Upgrade will eliminate the currently required manual interfaces with other NMMES systems to produce a seamless real-time environment that can accommodate all project management metrics, as well as all ship maintenance related metrics. Additionally, it will eliminate the manual data gathering and consolidation efforts required to produce Shipyard Interim Metrics; and eliminate the need for Headquarters and each shipyard to maintain their own unique respective standalone data files. ***FY 2018 Plans:*** Begin systems analysis and market research to determine the extent of mature commercial technologies that meet Upgrade requirements. Alignment the SPF Upgrade with NMMES Family of Systems and begin development/configuration of the product. ***FY 2019 Base Plans:*** Complete development and configuration of Upgrade, and begin Government Acceptance Testing of SPF Upgrade in preparation for FY19 deployment and implementation. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease reflects project deployment schedule.					
Title: NMMES Technical Refresh (NMMES-TR)	9.684	25.200	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Funding was moved to PU 3432 of PE 0605013N starting in FY19. The current Navy Maritime Maintenance Enterprise Solution (NMMES) toolset enables the execution of submarine, aircraft carrier, and surface ship maintenance and repair for the Naval Shipyards (NSY), Intermediate Maintenance Facilities (IMF), Regional Maintenance Centers (RMC), and Ship Repair Facilities (SRF). It consists of a family of systems and applications that are at (or nearing) their end-of-life. These systems and applications support a workforce of over 51,000 worldwide and enable approximately $9.5B per year					

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
of maintenance and repair work. The Workforce Management and Financial Management systems were removed from the NMMES TR scope by the Analysis of Alternative (AoA) Preferred Alternative, and will continue operation and sustainment as part of the NMMES portfolio. The critical business processes to schedule, execute, monitor, certify work, and pay employees at each activity are codified within the Information Technology (IT) toolset; there is no manual alternative. Annual efforts to restore the NMMES budgets to meet requirements have only been partially successful and have required multiple annual supplemental actions to address deficiencies. The urgency to modernize these systems has grown every year as deferred upgrades and underfunded sustainment has led to the current state of the NMMES toolset. The NMMES-TR is a pre-Milestone A acquisition program that will provide a sustainable enterprise IT solution leveraging Commercial, Off-The-Shelf (COTS) technology and business processes for shore maritime maintenance, which also standardizes processes and tools. Unlike the uniquely custom designed status quo toolset, the NMMES-TR solution will not implement product customization to match the current maintenance business processes; but rather, maintenance business processes will be modified to match the solution, thereby adopting industry best practices. Accordingly, the solution will be more flexible to the BPR process, and more agile to capitalize on efficiency improvement opportunities and innovations. This will facilitate alignment with the Optimized Fleet Response Plan (OFRP) by assisting the maintenance activities with accomplishing assigned tasks as planned in order that submarines, aircraft carriers, and surface ships can properly train and deploy on schedule. NMMES-TR will also provide a modern solution that will be more effective and efficient in combating cybersecurity threats, and capable of continuous monitoring. The actual solution will be formed after the Analysis of Alternatives (AoA). ***FY 2018 Plans:*** NMMES-TR in FY18 will accomplish the following work increments: 1) Completion of the design and development of a Work Brokering solution. This solution addresses both public and private yards for ship maintenance requirements and ship class maintenance plans that are then screened into maintenance availability projects for individual platforms - and then brokered to a maintenance activity for accomplishment based on available capabilities; 2) Conduct the design architecture, systems engineering, configuration and delivery of an Enterprise Services Bus (ESB) network/interfacing environment to provide for the support and transition from the NMMES solution to the NMMES-TR solution; 3) Conduct the planning and preparation for the acquisition (including releasing a Request for Proposal), the configuration, and the deployment of a Maintenance, Repair, and Overhaul (MRO) replacement solution TR					

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
increment. The schedule of this increment has been aligned with the Work Brokering solution and the ESB environment. ***FY 2019 Base Plans:*** Funding for this requirement has been realigned to PU 3432 beginning in FY 2019. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding was moved to PU 3432 of PE 0605013N starting in FY19.					
Title: Financial Technical Upgrade	0.000	4.910	3.590	0.000	3.590
Articles:	-	-	-	-	-
Description: The NMMES Family of Systems has two primary systems that are financial feeders; 1) SYMIS Mission Funded COST (aka COST) system which processes cost related data for mission funded activities with the Standard Accounting & Reporting System - Field Level (STARS-FL); and 2) the SYMIS Pre & Post Payroll Processes system which manages the Time & Attendance data from the NMMES Family of Systems to the Defense Civilian Payroll System (DCPS). These systems are targeted for modernization to address the FOUR mandatory requirements: 1) meeting FISCAM and auditability requirements; 2) transitioning COST to interface with SABRS, vice STARS-FL no later than 30 September 2018; 3) both these systems are COBOL-based. COST utilizes a 1990s era Case tool (PACBASE) to generate COBOL-ready code. In 2015 vendor support for the PACBASE tool was transitioned to an IBM subsidiary in France (who in 2016 informed the Navy that support for the tool would end by 2018), hence without this tool the COST system cannot be updated and therefore must be refreshed in order to operate; and 4) the rapid increase in the cost of gaining sufficient COBOL licenses to operate these two systems in support of fleet maintenance has also created emerging execution year budget challenges for the Navy to such an extent that it is now more feasible to immediately transition these systems to a non-COBOL solution than to continue in the current licensing structure. Hence, the Financial Technical Upgrade is to address these four urgent needs in order to continue operation of the NMMES Family of Systems beyond 2018. ***FY 2018 Plans:*** Complete development of the SABRS interface and conduct Government Acceptance Testing (GAT). Deploy and conduct training to the user community to effectively use the SABRS tool in conjunction with the NMMES ship maintenance toolset before the beginning of FY19. Complete and deploy the FISCAM improvements and					

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FIAR requirements necessary to meet financial auditability. Complete feasibility assessment to address COBOL alternatives. Conduct the software development necessary to transition both the COST & PPPP systems to be non-COBOL solutions. ***FY 2019 Base Plans:*** Complete the software development for the modernized COST & PPPP systems, and begin planning for GAT. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease reflects project deployment schedule.					
Title: Material Management Upgrade	1.000	5.250	4.750	0.000	4.750
Articles:	-	-	-	-	-
Description: The Material Access Technology-Mission Funded (MATmf) application is used by all Naval Shipyards to manage and provide logistical support for services and materials manufactured, purchased and utilized in the overhaul, repair, and maintenance of ships and submarines. MATmf provides quantitative, financial, and status information on industrial materials. It monitors the shop stores in the shipyard and assesses the direct material inventories. MATmf has reached end-of-life and is operating on software components that are considered obsolete. A Service Life Extension is required to support the future capabilities (i.e. eTWD requirements), to correct sustainability issues, and to improve the ability to support current and future ships maintenance. While the upcoming MSE releases will consolidate application databases (including MATmf into a data center environment); it does not include material integration across shipyards nor provide usable real time material information or metrics across the ship maintenance community. The MSE releases will also not convert the outdated development code, eliminate the time cumbersome manual batch processing, nor fix a host of long term shortcomings affecting the efficiency of MATmf (including long time printing limitations affecting Material Control Tags and waterfront performance). Over the past 5 years, NAVSEA 08 and the Corporate Material Process Action Team through multiple LEAN events has identified and documented many areas in MATmf that need enhancement to improve effectiveness. Some of these requirements include: 1) the ability to allow for Fiscal Year rollover of JMLs, 2) the ability to allow redistribution of bulk receipt inspected materials to other shipyards, 3) the ability to report transactions for BP28 assets, 4) improve the ability to create efficient processes for receipt of RFI tagged material into Shop Stores, 5) improve receipt of shipyard contracts into shipyard for receipt inspection, 6) allow DLR material in Shop Stores, 7) address transition to another handheld scanner as					

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
the current handhelds are no longer available for purchase. These deficiencies will be addressed in the Material Management Upgrade. ***FY 2018 Plans:*** Conduct initial design analysis and market research of current technologies. Complete assessment of handheld scanner alternatives insuring that the selected replacement handheld meets NAVSEA 08 cyber security requirements. ***FY 2019 Base Plans:*** Conduct software development efforts and begin Government Acceptance Testing (GAT) of the developed solution. Conduct Integration testing to insure the planned solution satisfactorily integrates with the NMMES Family of Systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease reflects project deployment schedule.					
Title: NMMES -- Maritime Systems Environment (MSE) -- Database Optimization	1.485	3.800	3.205	0.000	3.205
Articles:	-	-	-	-	-
Description: The NMMES Family of Systems is presently undergoing a Service Life Extension (SLE) to address cyber security deficiencies, consolidate and align databases across multiple data instances, and to transition the solution into an approved Navy Enterprise Data Center. Once the transition to the NEDC is complete and has reached stability the Database will be optimized to gain throughput efficiencies, capitalize of economies of scale, rationalize data structures to streamline the use of authoritative data and to provide standardized access to data across the fleet maintenance enterprise. ***FY 2018 Plans:*** Begin analysis and design of database structure and establish database configuration parameters. ***FY 2019 Base Plans:*** Complete database structuring and begin Government Acceptance Testing and independent validation of database performance. ***FY 2019 OCO Plans:***					

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease reflects project deployment schedule.					
Title: SUPDESK - Timekeeping For All	0.000	2.700	2.000	0.000	2.000
Articles:	-	-	-	-	-
Description: The current timekeeping system (SUPDESK) at the shipyards allows managers to input time for their employees. This is considered a financial compliance issue and requires the system be adjusted to allow all shipyard workers to input and certify their individual time. Will also add the capability to track and certify overtime approvals. ***FY 2018 Plans:*** Conduct advanced planning for Workforce Management Update including revalidation of requirements. Conduct initial design analysis and market research of current technologies. Begin software development and integration with NMMES; begin product deployment. ***FY 2019 Base Plans:*** Finalize software development and integration with NMMES; continue training and deployment to users at the Naval Shipyards and Regional Maintenance Centers. Gain Product stabilization by addressing user feedback and identified software deficiencies. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease reflects project deployment schedule.					
Title: Local Application Rationalization	0.000	2.245	3.000	0.000	3.000
Articles:	-	-	-	-	-
Description: Rationalize and down select to a subset of applications after assessing local applications in the shipyards and RMCs. Down-select to a common core set and standardize the functionality across the enterprise. There are numerous local applications at the shipyard that need to be rationalized into several "best of breed" as the Maritime Systems Environment (MSE) is deployed. This requires reviewing all local application functionality and determining which applications should be migrated.					

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Begin analysis and rationalization of local applications. Assess best of breed and designate top application as the standard enterprise selection. Begin planning and design for integration into NMMES. Review and implement cyber security changes required to host these applications at the Navy Enterprise Data Center (NEDC). ***FY 2019 Base Plans:*** This project is phased over two years. Funding increase reflects the tasks planned for execution. Tasks include; configuring and beginning Government Acceptance Testing of integration of best of breed selections with NMMES, training users and deploying to at the Naval Shipyards and Regional Maintenance Centers. Gain Product stabilization by addressing user feedback and identified software deficiencies. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Project funding increased to requirement based on available resources.					
Title: MSE Waterfront Process Improvement	0.000	0.000	1.000	0.000	1.000
Articles:	-	-	-	-	-
Description: The Maritime Systems Environment (MSE) Waterfront Processes Improvement Upgrade is focused on accelerating LEAN process improvement recommendations from industrial Process Action Teams into the embedded processes contained in the MSE. This is a multi-year initiative to not only address the backlog of LEAN recommendations in the ship maintenance community, but to also provide the impetus to accelerate the development of additional process improvements to gain further economies in the maintenance community. ***FY 2018 Plans:*** N/A. ***FY 2019 Base Plans:*** Prioritize mature LEAN finding based on best return on investment and begin analysis for integration into MSE. Structure improvements into series of Releases aligned with the MSE regular update cycle in order to accelerate delivery of capability to users. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Initial project planned to start in FY 2019 based on program funding and technical plans.					
Title: Enterprise Data Analytics ***Articles:*** ***Description:*** Establish capability to fully utilize navy authoritative maintenance data to develop predictive analysis and gain efficiencies in ship availabilities. ***FY 2018 Plans:*** N/A. ***FY 2019 Base Plans:*** Finalize functional and business process analysis and market analysis of commercial products. Select commercial package(s) and begin configuration and integration planning. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Initial project planned to start in FY 2019 based on program funding and technical plans.	0.000 -	0.000 -	2.000 -	0.000 -	2.000 -
Title: Product Data Management Integration ***Articles:*** ***Description:*** Modify the NMMES solution to be able to utilize the 3-D Product model information being delivered to the Navy by the shipbuilders for the Ford and Columbia Classes. Both the Ford Class Carrier and Columbia Class Submarine Programs are being designed, built and delivered utilizing 3-D integrated product models. Configuration and technical information will be provided to the government in electronic format rather than via paper-based drawings. The current suite of Shore Maintenance Systems cannot accept the data delivered by either program, which will impact the ability of the shore Maintenance Community to maintain and modernize these platforms. This is required to support the USS FORD Planned Incremental Availability (PIA) at Norfolk Naval Shipyard as well as future maintenance availabilities on both classes. ***FY 2018 Plans:***	0.000 -	0.000 -	6.410 -	0.000 -	6.410 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A. ***FY 2019 Base Plans:*** Begin analysis and integration planning of the selected tool with NAVSEA PEOs and shipbuilders. Configure the new tool and integrate with the NMMES product line. Perform software testing and train users at the Naval Shipyards. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Initial project planned to start in FY 2019 based on program acquisition schedules of Ford Class Carrier and Columbia Class Submarine Programs.					
Title: Mobility Solutions ***Articles:*** ***Description:*** Establish a "go everywhere" capability for the NMMES system at the Regional Maintenance Centers and Naval Shipyards. Include the capability to retrieve authoritative information across multiple, secure devices, (i.e. tablets, digital readers, scanners, etc.) to continue to exploit a paperless arena. ***FY 2018 Plans:*** N/A. ***FY 2019 Base Plans:*** Begin analysis and planning, including security considerations. Begin device integration and capability demonstrations. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Initial project planned to start in FY 2019 based on program funding and technical plans.	0.000 -	0.000 -	0.805 -	0.000 -	0.805 -
Accomplishments/Planned Programs Subtotals	26.018	64.233	37.855	0.000	37.855

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

The backbone of the present solution is a set of dated information technology (IT) products that are approaching end-of-life. In order to ensure that the IT toolset would continue functioning as required the Fleet Maintenance Board of Directors approved the establishment of the NAVSEA PMO-IT to oversee the selected development and sustainment efforts of this solution; to acquire and manage the IT resources necessary to gain further efficiencies in the systems; and to transition this solution to a more modern and efficient end state. Selected systems modernizations are aligned with ongoing systems sustainment to provide an IT solution until a Commercial of the Shelf (COTS) based Technical Refresh of this solution can be completed and deployed. Existing IT contracts will be used for sustainment services and new contracts will be put in place to support NMMES TR services, utilizing existing delivery orders where feasible.

E. Performance Metrics

System performance is measured using the following:
A. Operational Availability (A_o): Percent of time systems are available for use.
(1) Mean Down Time (MDT) is the mean time the system will be down to start and complete maintenance and corrective task.
MDT = (Total Down Time)/(Total Number of Maintenance). Measure of Performance (MOP): Total Down Time ? 87.6 Hrs/Year.
(2) Mean Time Between Maintenance (MTBM) is the mean time between maintenance, all corrective and preventive maintenance. MTBM = (Total Up Time)/(Total Number of Maintenance). MOP: A_o = MTBM / (MTBM+MDT) > 0.99.
B. Reliability: Ability of a system to perform its mission without failure or degradation under a prescribed set of operating conditions.
(1) Mean Time Between Failure (MTBF) is the mean time between unforeseen system failures which result in substantial loss in users' productivity, including being off-line unscheduled. MTBF = (Total Up Time)/(Total Number of Failures). MOP: MTBF > 3504 Hours
(2) Mean Time To Repair (MTTR) is the mean time to perform the corrective maintenance to repair the failure. MTTR = (Total Down Time for corrective maintenance)/(Total Number of Failures). MOP: MTTR less than or equal to 16 Hours.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/CPFF	NAVSEA : WNY, D.C.	119.936	16.334	Dec 2016	39.033	Oct 2017	37.855	Oct 2018	-		37.855	Continuing	Continuing	Continuing
Software Development	WR	NSLC : Mechanicsburg, PA	15.999	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Advance Planning Analysis	WR	SPAWAR : Arlington, VA	7.471	0.000		0.000		0.000		-		0.000	0.000	7.471	-
Advance Planning Analysis	TBD	NAVSEA : WNY, D.C.	6.820	9.684	Dec 2016	25.200	Nov 2017	0.000		-		0.000	0.000	41.704	-
Advance Planning Analysis	TBD	NSWC PHD : Port Hueneme, CA	5.000	0.000		0.000		0.000		-		0.000	0.000	5.000	-
		Subtotal	155.226	26.018		64.233		37.855		-		37.855	Continuing	Continuing	N/A

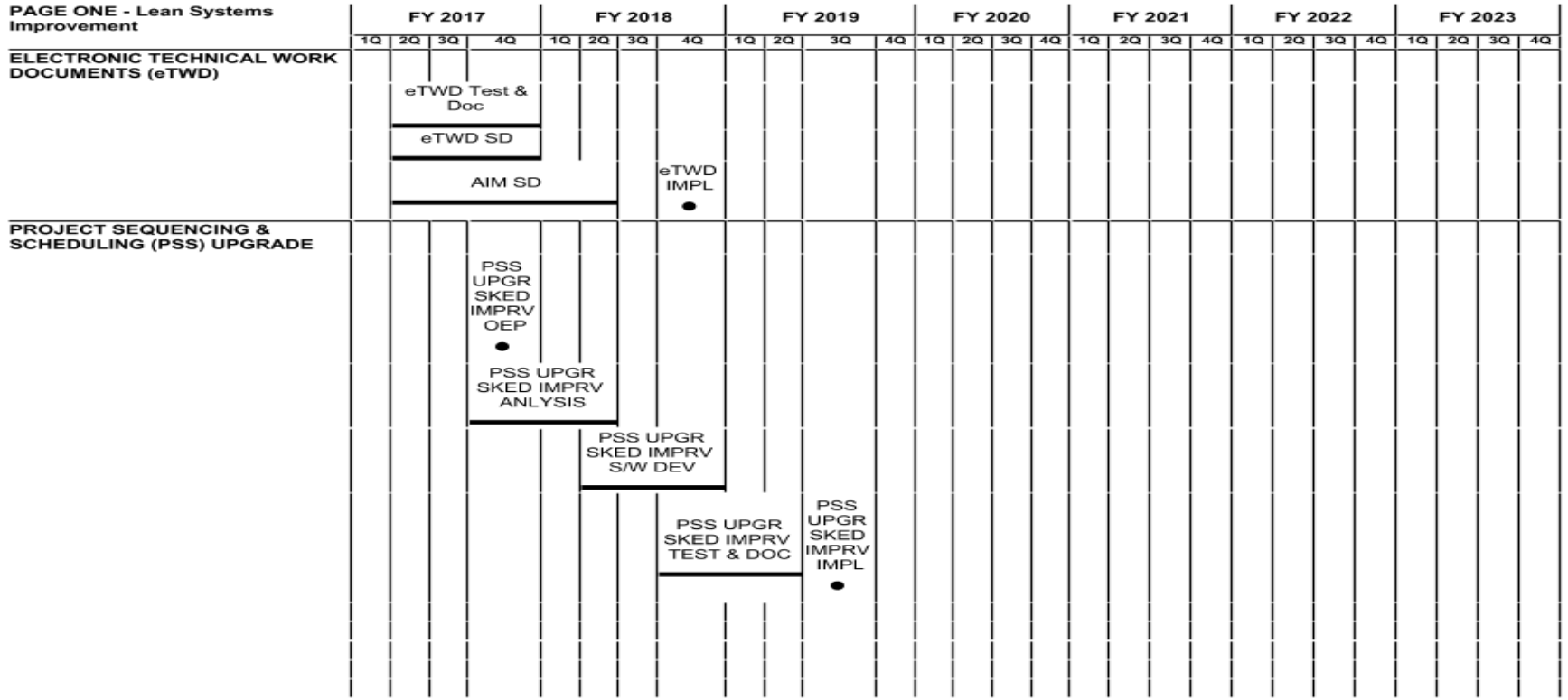
Remarks

Program plans to execute all contract awards for software development of shipyard and national systems through the NAVSEA SEAPORT vehicle and other competitively awarded contracts.

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	155.226	26.018		64.233		37.855		-		37.855	Continuing	Continuing	N/A

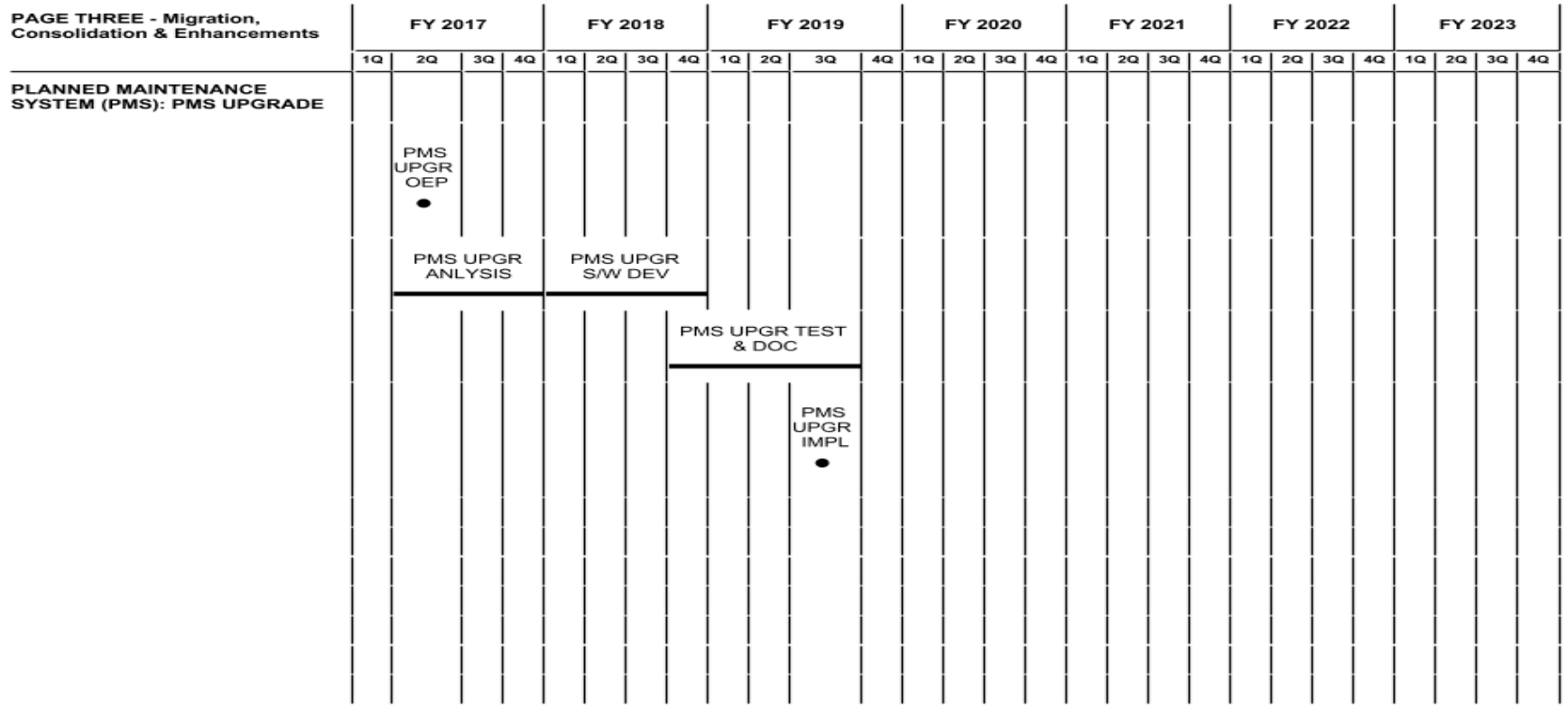
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*



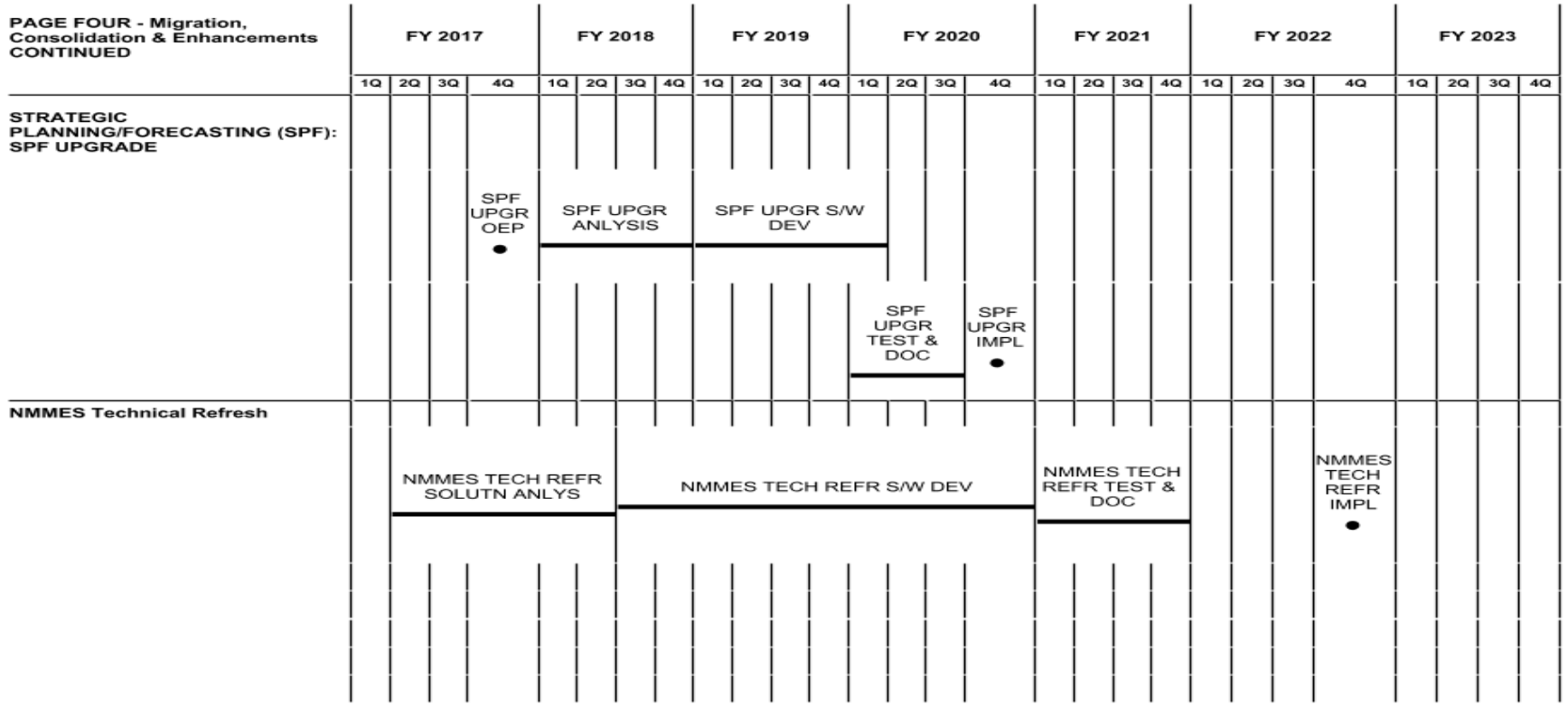
2019DON - 0605013N - 2904

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*



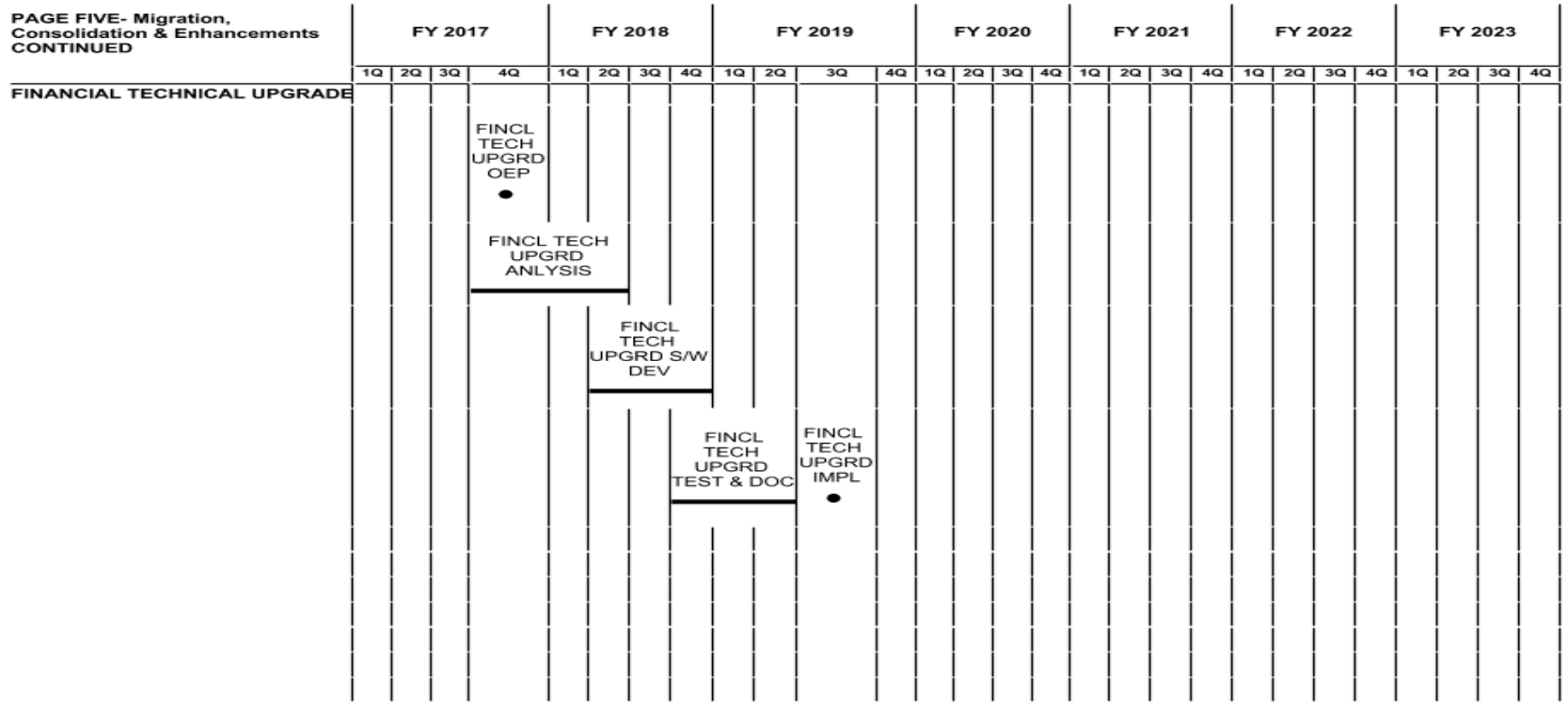
2019DON - 0605013N - 2904

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*



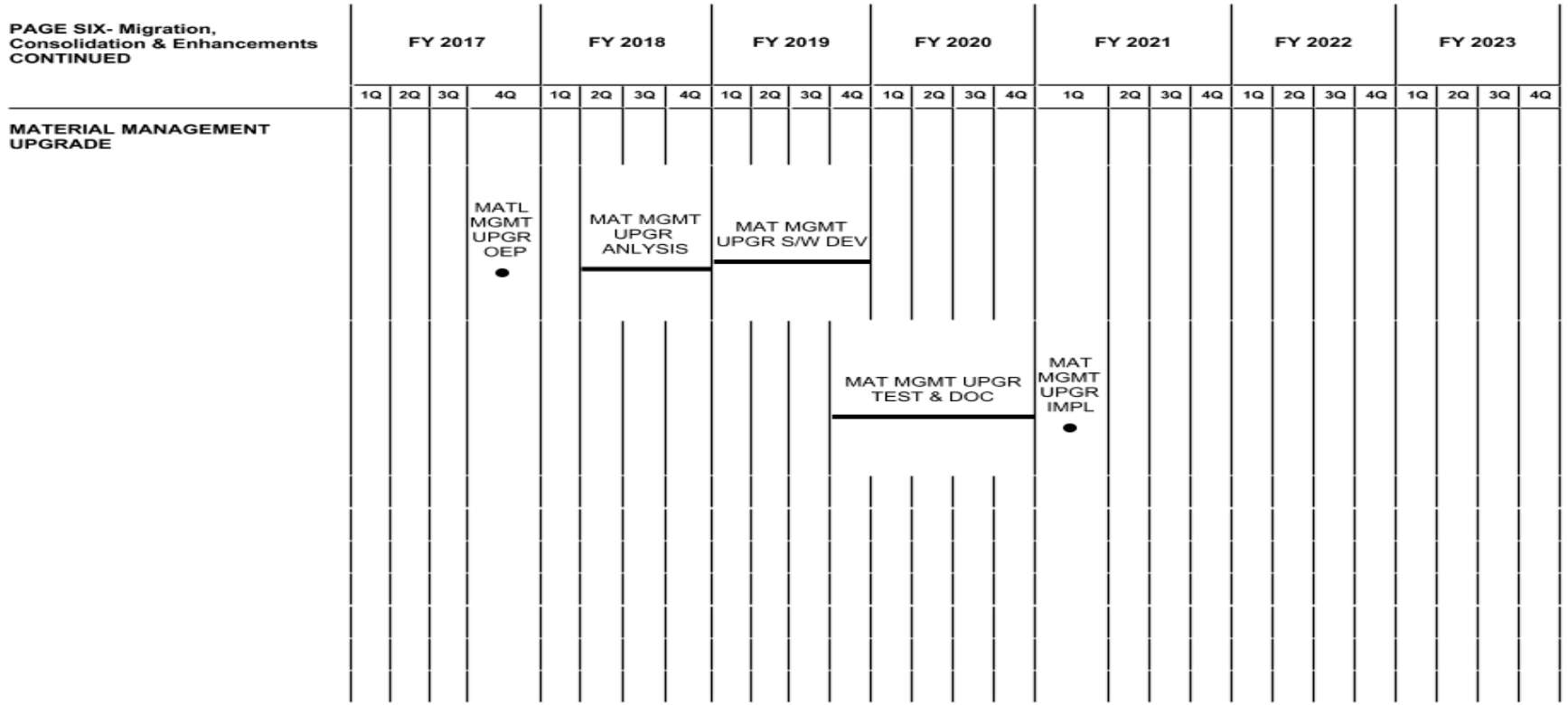
2019DON - 0605013N - 2904

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*



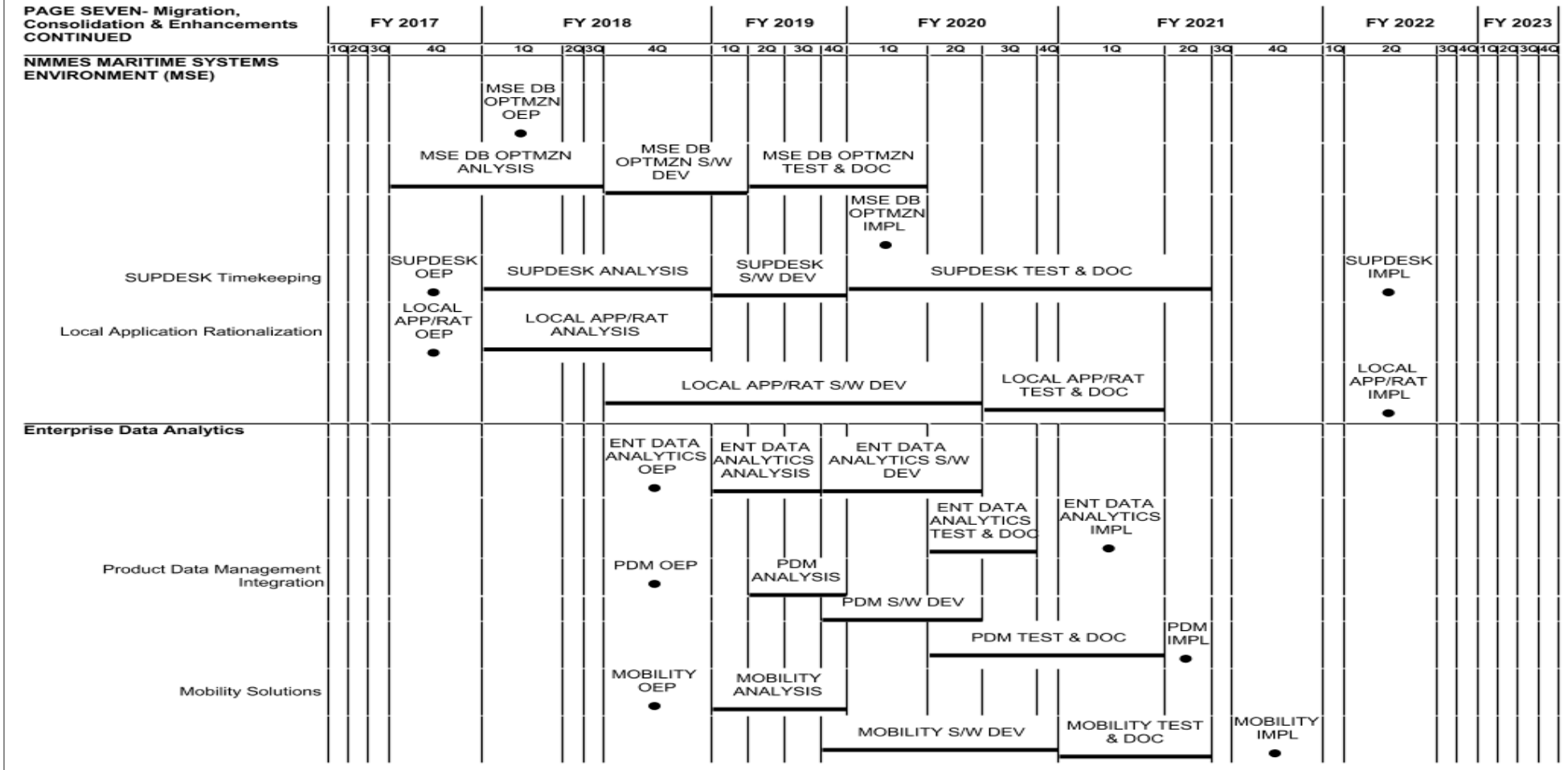
2019DON - 0605013N - 2904

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*



2019DON - 0605013N - 2904

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*



2019DON - 0605013N - 2904

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PAGE ONE - Lean Systems Improvement				
ELECTRONIC TECHNICAL WORK DOCUMENTS (eTWD): eTWD Testing & Documentation	2	2017	4	2017
ELECTRONIC TECHNICAL WORK DOCUMENTS (eTWD): eTWD Software Development	2	2017	4	2017
ELECTRONIC TECHNICAL WORK DOCUMENTS (eTWD): AIM Changes	2	2017	2	2018
ELECTRONIC TECHNICAL WORK DOCUMENTS (eTWD): eTWD Implementation	4	2018	4	2018
PROJECT SEQUENCING & SCHEDULING (PSS) UPGRADE: PSS UPGRADE: PSS Upgrade Scheduling Improvement OEP Approval	4	2017	4	2017
PROJECT SEQUENCING & SCHEDULING (PSS) UPGRADE: PSS Upgrade Scheduling Improvement Analysis	4	2017	2	2018
PROJECT SEQUENCING & SCHEDULING (PSS) UPGRADE: PSS Upgrade Scheduling Improvement Software Development	2	2018	4	2018
PROJECT SEQUENCING & SCHEDULING (PSS) UPGRADE: PSS Upgrade Scheduling Improvement Testing & Documentation	4	2018	2	2019
PROJECT SEQUENCING & SCHEDULING (PSS) UPGRADE: PSS Upgrade Scheduling Improvement Implementation	3	2019	3	2019
PAGE THREE - Migration, Consolidation & Enhancements				
PLANNED MAINTENANCE SYSTEM (PMS): PMS UPGRADE: PMS Upgrade OEP Approval	2	2017	2	2017
PLANNED MAINTENANCE SYSTEM (PMS): PMS UPGRADE: PMS Upgrade Analysis	2	2017	4	2017
PLANNED MAINTENANCE SYSTEM (PMS): PMS UPGRADE: PMS Upgrade Software Development	1	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PLANNED MAINTENANCE SYSTEM (PMS): PMS UPGRADE: PMS Upgrade Testing & Documentation	4	2018	3	2019
PLANNED MAINTENANCE SYSTEM (PMS): PMS UPGRADE: PMS Upgrade Implementation	3	2019	3	2019
PAGE FOUR - Migration, Consolidation & Enhancements CONTINUED				
STRATEGIC PLANNING/FORECASTING (SPF): SPF UPGRADE: SPF UPGRADE OEP Approval	4	2017	4	2017
STRATEGIC PLANNING/FORECASTING (SPF): SPF UPGRADE: SPF UPGRADE Analysis	1	2018	4	2018
STRATEGIC PLANNING/FORECASTING (SPF): SPF UPGRADE: SPF UPGRADE Software Development	1	2019	1	2020
STRATEGIC PLANNING/FORECASTING (SPF): SPF UPGRADE: SPF UPGRADE Testing & Documentation	1	2020	3	2020
STRATEGIC PLANNING/FORECASTING (SPF): SPF UPGRADE: SPF UPGRADE Implementation	4	2020	4	2020
NMMES Technical Refresh: NMMES Technical Refresh Advanced Planning	1	2017	1	2017
NMMES Technical Refresh: NMMES Technical Refresh OEP Approval	4	2017	4	2017
NMMES Technical Refresh: NMMES Technical Refresh Alternative Analysis	3	2017	2	2018
NMMES Technical Refresh: NMMES Technical Refresh Solution Analysis	2	2017	2	2018
NMMES Technical Refresh: NMMES Technical Refresh Software Development	3	2018	4	2020
NMMES Technical Refresh: NMMES Technical Refresh Testing & Documentation	1	2021	4	2021
NMMES Technical Refresh: NMMES Technical Refresh Implementation	4	2022	4	2022
PAGE FIVE- Migration, Consolidation & Enhancements CONTINUED				
FINANCIAL TECHNICAL UPGRADE: Financial Tech Upgrade OEP Approval	4	2017	4	2017
FINANCIAL TECHNICAL UPGRADE: Financial Tech Upgrade Analysis	4	2017	2	2018
FINANCIAL TECHNICAL UPGRADE: Financial Tech Upgrade Software Development	2	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
FINANCIAL TECHNICAL UPGRADE: Financial Tech Upgrade Testing & Documentation	4	2018	2	2019
FINANCIAL TECHNICAL UPGRADE: Financial Tech Upgrade Implementation	3	2019	3	2019
PAGE SIX- Migration, Consolidation & Enhancements CONTINUED				
MATERIAL MANAGEMENT UPGRADE: Material Mgmt Upgrade OEP Approval	4	2017	4	2017
MATERIAL MANAGEMENT UPGRADE: Material Mgmt Upgrade Analysis for COST Replacement	2	2018	4	2018
MATERIAL MANAGEMENT UPGRADE: Material Mgmt Upgrade Software Development	1	2019	4	2019
MATERIAL MANAGEMENT UPGRADE: Material Mgmt Upgrade Testing & Documentation	4	2019	4	2020
MATERIAL MANAGEMENT UPGRADE: Material Mgmt Upgrade Implementation	1	2021	1	2021
PAGE SEVEN- Migration, Consolidation & Enhancements CONTINUED				
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Database Optimization: OEP Approval	1	2018	1	2018
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Database Optimization: Analysis	4	2017	3	2018
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Database Optimization: Software Configuration and Standardization	4	2018	1	2019
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Database Optimization: Testing & Documentation	2	2019	1	2020
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Database Optimization: Implementation	1	2020	1	2020
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): SUPDESK Timekeeping: SUPDESK: OEP Approval	4	2017	4	2017
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): SUPDESK Timekeeping: SUPDESK: Analysis	1	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): SUPDESK Timekeeping: SUPDESK: Software Development	1	2019	4	2019
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): SUPDESK Timekeeping: SUPDESK: Testing & Documentation	1	2020	2	2021
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): SUPDESK Timekeeping: SUPDESK: Implementation	2	2022	2	2022
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Local Application Rationalization: Local APP/RAT: OEP Approval	4	2017	4	2017
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Local Application Rationalization: Local APP/RAT: Analysis	1	2018	4	2018
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Local Application Rationalization: Local APP/RAT: Software Development/Enhancement	4	2018	2	2020
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Local Application Rationalization: Local APP/RAT: Testing & Documentation	3	2020	1	2021
NMMES MARITIME SYSTEMS ENVIRONMENT (MSE): Local Application Rationalization: Local APP/RAT: Implementation	2	2022	2	2022
Enterprise Data Analytics: Enterprise Data Analytics: OEP Approval	4	2018	4	2018
Enterprise Data Analytics: Enterprise Data Analytics: Analysis	1	2019	3	2019
Enterprise Data Analytics: Enterprise Data Analytics: Software Configuration and Standardization	4	2019	2	2020
Enterprise Data Analytics: Enterprise Data Analytics: Testing & Documentation	2	2020	3	2020
Enterprise Data Analytics: Enterprise Data Analytics: Implementation	1	2021	1	2021
Enterprise Data Analytics: Product Data Management Integration: PDM: OEP Approval	4	2018	4	2018
Enterprise Data Analytics: Product Data Management Integration: PDM: Analysis	2	2019	4	2019
Enterprise Data Analytics: Product Data Management Integration: PDM: Software Configuration and Standardization	4	2019	2	2020
Enterprise Data Analytics: Product Data Management Integration: PDM: Testing & Documentation	2	2020	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2904 / *NAVSEA IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Enterprise Data Analytics: Product Data Management Integration: PDM: Implementation	2	2021	2	2021
Enterprise Data Analytics: Mobility Solutions: Mobility Solutions: OEP Approval	4	2018	4	2018
Enterprise Data Analytics: Mobility Solutions: Mobility Solutions: Analysis	1	2019	4	2019
Enterprise Data Analytics: Mobility Solutions: Mobility Solutions: Software Development	4	2019	4	2020
Enterprise Data Analytics: Mobility Solutions: Mobility Solutions: Testing & Documentation	1	2021	2	2021
Enterprise Data Analytics: Mobility Solutions: Mobility Solutions: Implementation	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 2905 / *BUPERS IT*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2905: *BUPERS IT*	57.890	26.127	52.957	99.289	-	99.289	162.961	157.299	78.776	64.429	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Research and Development Funds for MPT&E Transformation under PE 0604703N have been consolidated within PE 0605013N PU 2905 starting in FY19.

A. Mission Description and Budget Item Justification

This effort is the linchpin of the Navy MPT&E (Manpower, Personnel, Training & Education) business IT Transformation strategy which stems from the decision to invest in programs that directly align with the Sailor 2025 vision. The current 70 year old business processes and 40 year old obsolete IT systems will not sustain Fleet anticipated growth and is not cost efficient nor effective. The Transformation strategy involves revolutionary change by rapid implementation of MPT&E business IT products using the Industry Best Practices Model (e.g., early investment for largest ROI, rapid prototyping and testing, and vanilla COTS products usage.) Four projects are the cornerstones of the Navy/N1 Transformation strategy. The Navy Personnel and Pay System (NP2) includes Navy Personnel and Pay (NP2)Standard modernization and the collapse of Legacy Manpower System functionality. Second, a Single Point of Entry (SPOE) for Sailor self-service is composed of My Navy Portal (MNP), Identity and Access Management (IdAM), a Customer Relations Management (CRM) solution, and a centralized and standardized customer service center (The My Navy Career Center (MNCC)). Third, Learning Stack (LS) improves the accessibility, sophistication, and collaborative nature of educational outreach. Finally, the Authoritative Data Environment (ADE) will enable the collapse of 9 legacy data warehouses into a single, authoritative source of data truth for Sailors and Navy decision makers. Additionally, ADE will enable modern data analytics and business intelligence capabilities. All of the technology solutions will leverage hyper scale cloud based services in order to provide secure, accessible and cost effective business IT.

The increase in FY19 is aligned with the Navy's MPT&E IT Transformation initiative to develop a technology component that forms an MPT&E Navy Personnel and Pay (NP2) system. Transformation activities will include conducting prototypes, testing, integration, and migration to a cloud environment. There is significant investment being made in the development of Single Point of Entry/My Navy Portal which will provide the Sailor with a self-service web environment. A modest portion of the FY19 increase is attributed to LMS-DL transitioning field tested capability and necessary integration/development activities to enterprise production.

BILLET BASED DISTRIBUTION (BBD)

Initiative aimed at modernizing distribution systems to increase personnel readiness, improve fit and provide clear visibility to the impact on mission readiness at the billet level. As part of the Navy's transformation initiative, BBD functionality will be consolidated into NP2.

LEARNING MANAGEMENT SYSTEM - DISTANCE LEARNING (LMS-DL)

LMS-DL is aligned with the Learning Stack (LS) technology component of the Navy's Transformation initiative. LMS-DL focuses on advancing Navy learning, creating a career learning continuum and leveraging evolving technologies to expand learning solutions when and where the Sailor needs them. The Collaborative Learning

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

Environment (CLE) is a key component within the learning IT strategy that leverages Commercial-Off-the-Shelf (COTS) products to integrate the CLE with intelligent tutors, a multi-purpose reconfigurable training system (MRTS), electronic classrooms (ECR), trainers and labs, interactive multimedia instruction (IMI), instructors, and a virtual environment. The increase in FY19 is to transition a COTS LMS from a field test to enterprise production.

Aligned with the Navy's IT transformation initiative, Learning Management System permits:

(1) Mobile & flexible delivery of modular training to the sailor
(2) Synchronization of work requirements with learning modules to ensure proper training is delivered at the right time

Funding will develop and deploy new technologies for modularized training in fleet concentration areas to support the continuum of learning to include:

(1) Development, modification or replacement of the current LMS platform
(2) Integration of Manpower, Personnel, Training, and Education (MPT&E) management tools to support end to end business processes (billet information, assignment, distribution, student management, learning management, personnel information, advancement) that will be impacted by changes to learning delivery and career profiles via Progressive Navy Enlisted Classifications (e.g. Total Force Manpower Management System, Navy Personnel and Pay System, Learning Assessment System, Navy Training Management Planning System).

The Learning Management tools and supporting IT infrastructure must also be modified to support management of training into the Delayed Entry Program, the growing use of demonstration videos, social media, student and learning management for MPT&E mobility efforts, gaming and simulation technology as it is brought on-line.

LMS-DL will also introduce the Learning Continuum Pilot, a risk reduction effort that develops proof of concept alignment of sailor training requirements with learning content delivery.

MY NAVY PORTAL (MNP)

MNP is an integrated web portal that consolidates the Navy's Human Resource portals, knowledge, and applications into a single and simplified user experience. Through the use of a multi-phased development approach, MNP will provide an intuitive self-service single point of entry (SPOE) for Sailors to view and manage their personnel and career information.
MNP provides Active and Reserve Sailors with personalized interactive experiences and allows access to relevant information including learning content, human resource applications, and career business processes and tools.
MNP Phase 2C continues to mature eleven Career Life Event (CLE) capabilities. Phase 2C continues requirements refinement work with key Fleet users and stakeholders and integrates or develops the identified CLEs.
My Navy Portal may address previously deferred requirements from prior phases or in support of the Chief of Navy Personnel's IT Transformation initiatives.

ANALYSIS OF ALTERNATIVE/ECONOMIC ANALYSIS (AOA)

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

The Navy will conduct multiple AoAs and studies to analyze viable alternatives in order to determine the most efficient and effective solution to address the modernization of elements of the Navy's Manpower, Personnel, Training and Education (MPT&E) IT portfolio. AOA will assess operational effectiveness, suitability, and costs of non-tactical systems to meet emerging capability requirements.

NAVY STANDARD INTEGRATED PERSONNEL SYSTEM (NSIPS)(Will become NP2)

The NP2 increase in FY19 supports the de-customization of the Navy Standard Integrated Personnel System (NSIPS) and integration of Direct to Treasury Pay Capability via Pay Modernization (Pay Mod). This combined effort (named NP2) will result in an integrated, vanilla Commercial Off the Shelf, cloud hosted, integrated personnel and pay solution that will provide the navy with an IT system that is modern, highly automated, auditable, and more efficient. FY19 efforts include:

1. Continuation of the second Field Test including agile development of Treasury Direct Disbursing (TDD) and Active Component / Reserve Component (AC/RC) Permeability.
2. Migration of field test to a secure and accredited commercial cloud hosting solution.
3. Completion of Legacy NES and OPINS consolidation efforts.
4. Integration of Bi-Service PeopleSoft license with NSIPS personnel and pay modernization solution.

A 2015 analysis of alternatives for integration of personnel and pay capabilities recommended the use of Oracle PeopleSoft 9.2 with Global Payroll for achieving the Navy's Personnel and Pay IT needs. Follow-on analysis conducted as part of the MPT&E transformation efforts in 2016 and 2017 indicated that the most cost effective approach to achieving the Transformation goals of modernizing HR Business System IT consistent with industry best practices was de-customization of the Navy Standard Integrated Personnel System (NSIPS) which uses Oracle PeopleSoft as its core technology, integration with Global Payroll, use of General Ledger to maximize auditability and accounting functions and hosting of the integrated solution. This combined effort (named NP2) will result in an integrated, vanilla Commercial Off the Shelf, cloud hosted, integrated personnel and pay solution that will provide the navy with an IT system that is modern, highly automated, auditable, and more efficient.

Implementation of NP2 will result in several key benefits:

1. Improved accuracy and auditability of personnel and pay transactions.
2. Treasury Direct Disbursing eliminating Navy reliance on the sunsetting DJMS system.
3. Improved permeability of Active and Reserve Components to improve accuracy and eliminate delays in pay processing when a member moves between components.
4. Increased automation of common personnel and pay transactions
5. Integration of functionality currently spread across 55 different adhoc and outdated HR Business Systems.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

Efforts in FY19 are focused on system development, testing and delivery of core components associated with Military Pay, Personnel Transactions that effect Pay, Auditability, Accounting, and Treasury Direct Disbursement. Beyond F19, development will continue and will bring continued integration of legacy systems such as those used for detailing and distribution, management of Sailor performance, and talent management and matching.

NAVY MANPOWER REQUIREMENTS SYSTEM (NMRS)

NMRS will modernize obsolete software and incorporate a wide array of enhancements (expanded capabilities based on sponsor's approved Functional Requirements Document) of new capabilities in support of Manpower Requirement efficiencies.

NMRS is a key tool which Navy manpower managers rely on to set, implement, and execute manpower requirements. Recommendations for improving data bases and the Navy's mobilization capacity rely on NMRS to make strength determinations. The planned effort also includes technical evaluation and integration of products produced by the Simulation Toolset for Analysis of Mission, Personnel and Systems (STAMPS) program. As envisioned by the Navy's Transformation initiative, NMRS will eventually be consolidated into the MPT&E Personnel and Pay System technology component of the transformation.

RISK MANAGEMENT INFORMATION (RMI)

The RMI program is a consolidation of DON risk management requirements into a single Program of Record (POR) to provide modern safety reporting and management capabilities for both active and reserve Navy and Marine Corps commands. RMI enables agile responses to business rule changes, automation of routine actions, improved data integrity, and facilitates self-service for organizations and individuals.

RMI is being developed in three increments of capabilities: Streamlined Incident Reporting (SIR), Safety Program Management (SPM), and Analysis & Dissemination (A&D). A fourth requirement, Single Point of Entry (SPOE) integration, will be accomplished as part of the development of the three RMI increments since each will be built on the same Commercial Off The Shelf (COTS) platform. Each of these capabilities will be acquired as individual Abbreviated Acquisition Programs using an incremental development approach for reengineered business processes, while consolidating five legacy systems Web-Enabled Safety System (WESS), Enterprise Safety Application Management Systems (ESAMS), Portsmouth Occupational Accident and Illness Reporting System (POAIRS), Medical Mishap and Compensation (MMAC), and Injury Tracker (INJTRK).

AUTHORITATIVE DATA ENVIRONMENT (ADE)

ADE is part of the Navy's MPT&E IT Transformation initiative aligned directly with the Authoritative Data Environment technology component of the transformation. ADE is aimed at transitioning the current project based ADE into a full enterprise solution that is based on modern IT service models and cloud hosting technology. The transformation initiative will consolidate multiple legacy data warehouses and stream that data through a single, authoritative environment. This will advance data analytics and visualization capabilities, and add common platform services in a big data environment that is consistent with private industry. This acceleration toward a true Navy-wide personnel authoritative data environment is a transformational increase in capability for decision support and improving personnel readiness.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

As part of the Transformation strategy, the Chief of Naval Personnel has directed expansion and improvements of the ADE in making MPT&E data more available to commanders, sailors, business owners and fleet executive leadership. The ADE provides infrastructure, operations and sustainment of the Navy MPT&E Authoritative Data Warehouse(ADW), enterprise service bus, and web support services.

The capabilities delivered by this funding include:
(1) Completed "golden record" expansion increments
- Data quality
- Governance
- Security
- Data standardization

(2) Increased capabilities for MPT&E supply chain & business operations
- Data discovery
- Advanced visualization tools
- Predictive analytics

(3) Enhanced architecture to support unstructured data and "big data" analytics
(4) Improved support for future identity management & access for mobile device capability

APPLICANT RELATIONSHIP MANAGEMENT (ARM)

ARM provides automated support of the management of recruiting information. ARM enables all levels of recruiting to have real-time access to timely and accurate information. ARM provides managers with decision-making support by consolidating Navy Recruiting Command (NRC) legacy application systems. The complete ARM Systems Dev/Mod effort will incorporate biometrics and paperless implementation across all lines of business systems to gain additional efficiencies.

Included in the ARM program is the Self Service Accessions Application (SSAA). Phase II of this effort will build the SSAA application into the ARM system. SSAA is a mobile device-based software application. SSAA supports a change in the NRC business processes from a recruiter-driven business model to an applicant self-service business model. This "app" will be used by applicants to collaborate with recruiters anytime & anywhere to more efficiently and effectively navigate the recruiting process. As envisioned by the Navy's Transformation initiative, ARM functionality will eventually be consolidated into the MPT&E Integrated Personnel and Pay System technology component of the transformation.
2905.S22 Funding associated with Personnel TEMPO (PERSTEMPO) is being aligned to PE 060513N 2905 beginning in FY15. This aligns the funds with the organization required to execute PERSTEMPO strategy as directed by the CNO to the CNP. Two components are rolled together, modifying the ITEMPO system and further developing the Navy Deployment Health Location process. This strategy consists of Business Process Re-engineering (BPR) defined requirements (artifact is a Functional Requirements Document-FRD), modernization/risk reduction of existing system (ITEMPO) and a process that uses our corporate systems at DMDC Mechanicsburg.

The desired effects of PERSTEMPO strategy are:

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

- Generate efficiencies throughout the Fleet to meet statutory requirements and improve Fleet readiness.
- Provide improved service to Sailors (improving retention).
- Facilitate informed management decision making.

Associated sub-projects:

Individual TEMPO (ITEMPO): PERSTEMPO was implemented to comply with Sections 586 and 923 of the FY00 NDAA, now within 10 USCS 991. This is a non-acquisition category program. Each military service is to track and manage the number of deployed days and number of temporary duty days away from homeport for active and reserve personnel. Information is reported to DoD/DMDC, which is used to report to the Secretary of Defense. ITEMPO is the system used to comply with these directives. PERSTEMPO supports Navy management of stress on the force as requested by the CNO; Commander, U.S. Fleet Forces Command (N1); and the Commander, U.S. Pacific Fleet (N1). Enhancements will be performed on the primitive ITEMPO functional tools/metrics to make it actionable, current in technology, user friendly, and integrated into a variety of personnel and pay systems. Preparations are already underway to complete the FRD and perform a gap analysis within existing resources. This will support pay auditability/certainty when payment is authorized.

DEPLOYMENT HEALTH LOCATION: Deployment Health Location is being implemented per DoD Instruction 6490.03, "Deployment Health," (DoD Instruction) August 11, 2006. This requires the Military Departments to plan, program, and implement a system to ensure daily location recording for all deployed personnel assigned, attached on temporary duty, or temporary additional duty to deployed units. The Services are required to report the daily location information electronically to DMDC at least weekly. Also, this will correct the finding by DoD Inspector General Report NO. DODIG 2012-112 of Jul 18, 2012.

Capability change for ITEMPO: The system has had no significant software change in more than 8 years. The report mechanisms are extremely antiquated.

Capability change Deployment Health Location: Deployed Service members are potentially subject to occupational and environmental hazards that can include exposure to harmful levels of environmental contaminants, such as industrial toxic chemicals, chemical and biological warfare agents, or radiological and nuclear contaminants. These hazards may include contamination from the past use of a site, battle damage, stored stockpiles, military use of hazardous materials, or from other sources. Harmful levels include high-level exposures that result in immediate health effects and low-level exposures that could result in delayed or long-term health effects. Collecting deployment information will allow the Military Health System to identify populations at risk for occupational and environmental exposures that may need medical follow-up. Improving timeliness of treatment will have a positive effect on readiness and long-term wounded warrior care.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Billet Based Distribution (BBD)	2.140	4.860	4.800	0.000	4.800
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete testing and deployment of BBD Phase 1C. Begin requirements analysis, design and development of BBD Phase 2 Enlisted Optimization and Slating and Phase 2 Officer functionality. ***FY 2019 Base Plans:*** Complete Development and Testing of Enlisted Optimization/Slating and Officer functionality. Complete Requirements Analysis of Officer Optimization/Slating and Enlisted Assignment functionality. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease of $60K reflects ramp down to completion of efforts associated with the Enlisted/Officer Optimization/Slating functionalities.					
Title: Learning Management System - Distance Learning (LMS-DL)	0.613	5.606	6.469	0.000	6.469
Articles:	-	-	-	-	-
FY 2018 Plans: 1. Completion of pilot project review and assessments. 2. Design, design review, testing, production readiness, and deployment of Career Profile functionality. 3. Procure and standup Collaborative Learning Environment (CLE) for enterprise based on pilot results. ***FY 2019 Base Plans:*** 1. Procure and implement LMS-DL Web Conferencing capability and integrate with existing LMS-DL components to form decentralized learning environment. 2. Integrate COTS LMS solution with Learning Content Repository. 3. Integrate Optimized Scheduler with capability to manage classroom usage. 4. Develop Game Engine capable of harmonizing with LMS components. 5. Development and integration of LMS components to support seamless CLE toolset. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to functional development efforts for a flexible learning management system (Learning Stack) that is an enterprise online training delivery platform that provides training and a collaborative					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
learning environment for Sailors world-wide, ashore and afloat as a foundational effort in the N1 MPT&E IT Transformation.					
Title: My Navy Portal (MNP)	3.269	4.290	11.145	0.000	11.145
Articles:	-	-	-	-	-
FY 2018 Plans: 1. Continue the development and integration of portal CLE portlet capabilities for Sailors to manage their careers in an intuitive self-service web environment. 2. Provide on-going training and support to identified MNP content and page administrators who must be trained on the new capability being developed for each incremental release of new MNP capability. 3. Integrate with MPT&E applications and capabilities. MNP functional users and sponsors continue to shift their priorities for MNP integration with outside systems. Those outside system integrations require new MNP development/modernization code builds to enable MNP to successfully partner with them. 4. Support development of a cloud MNP hosting solution. MNP requires new development/modernization of its underlying architecture to function properly once migrated to the cloud hosting platform.					
FY 2019 Base Plans: 1. Support evolving MNP into a Single Point of Entry (SPOE) as a key component of OPNAV N1's IT Transformation efforts. 2. Continue the development and integration of portal CLE portlet capabilities for Sailors to manage their careers in an intuitive self-service web environment. 3. Integrate with OPNAV N1s "55 to 1" Transformation plan (system consolidation) in order to streamline MPT&E applications and capabilities. MNP functional users and sponsors continue to refine their priorities for MNP integration with outside systems. Those discrete system integrations require new MNP development/ modernization code builds to enable MNP to successfully partner with them. 4. Support development of a commercial cloud MNP hosting solution. MNP seeks to migrate from a government cloud hosting platform to a commercial cloud hosting solution. 5. Develop several mobile applications as a key component of OPNAV N1s Sailor Self Service drive. My Navy Portal will serve as the front-end, electronic interface for Sailor ticket requests coming into the center. 6. Partner with OPNAV N1 to integrate and serve as a key platform to support the My Navy Career Center and My Navy Self Support Services.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
7. Assist in establishing a core Identity Access Management program to improve Fleet authorization and security procedures. Software will require modest reconfiguration to meet Navy security parameters. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to the development and integration of CRM tool with SPOE and the link to the My Navy Career Center.					
Title: Analysis of Alternative Economic Analysis (AOA EA) ***Articles:*** ***FY 2018 Plans:*** 1. Complete AoA for cloud transition Courses Of Action (COA) 2. Complete AoA for personnel accountability processes 3. Complete AoA for personnel manpower analysis for Sailor 2025 4. Non-AoA studies and analyses encompassing the MPT&E enterprise. ***FY 2019 Base Plans:*** 1. Begin AoA for risk reduction field test study for PersPay ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding decrease of $200K due to fewer AoA's scheduled in FY19.	0.800 -	0.700 -	0.500 -	0.000 -	0.500 -
Title: Navy Manpower Requirements System (NMRS) ***Articles:*** ***FY 2018 Plans:*** 1. Complete design phase 2. Conduct development phase 3. Complete CDR 4. Initiate system testing	0.000 -	2.000 -	1.500 -	0.000 -	1.500 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
NMRS will begin design and development of the new capabilities of the Fleet Manpower Requirements Document (FMRD) that will improve the Navy's ability to forecast/determine/implement manpower requests for the Navy. Additionally, NMRS will integrate enhanced functionality from the Simulation Toolset for Analysis of Mission, Personnel and Systems (STAMPS) S&T effort, merging the new product into a single cohesive manpower system within TFMMS. Testing will ensure that the developed design for the enhanced NMRS/ Manpower system meets all requirements. ***FY 2019 Base Plans:*** 1. Continue NMRS Incremental Acceptance Testing 2. Continue to integrate & test STAMPS functionality 3. Continue IA / Cybersecurity strategy 4. Upgrade & conduct operational Test NEDC environments (CL & UNCL) 5. Standup & begin testing of DISA CDS 6. Begin data load, data validation & verification 7. Begin design, development & testing of interfaces & reports 8. Initiate Logistics & Training strategy NMRS will continue functional system testing of the new capabilities of the Fleet Manpower Requirements Document (FMRD). NMRS will continue to integrate enhanced STAMPS functionality. NMRS will continue its Information Assurance (IA) / Cybersecurity Strategy to ultimately achieve the authority to operate (ATO) prior to production deployment. NMRS will upgrade its current Classified & Unclassified NEDC environments and standup and begin testing its DISA Cross Domain Solution (CDS). NMRS will continue data verification & validation and begin design, development & testing of required interfaces & reports. NMRS will initiate its Logistics & Training execution strategy. The above mentioned activities are required to conduct the Test Readiness Review (TRR) and to begin User Acceptance / Product Code Completion Testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease is due completion of several system tests that began in FY18 but are completed early in FY19 and will not require funding for the entire FY.					
Title: Navy Personnel and Pay (NP2) (Formerly NSIPS)	8.847	23.845	63.775	0.000	63.775
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: NP2 increase in FY18 is aligned with the Sailor 2025 initiative to modernize personnel systems. The substantial increase is attributed to the planned start of the Pay Modernization (PayMod) program, and also includes an add in support of the DoD Force of the Future for a Navy AC/RC Permeability Solution to; (1) extend the reach for soliciting candidates for Navy jobs, (2) streamline the internal processes and supporting technologies to ensure timely payment for personnel who transition between AC, RC, Government civilian or contractor jobs, and (3) improve the Navy's ability to support Component Commanders with rapid requirements posting and talent acquisition for emergent needs. 1. Bi-Service PeopleSoft license acquisition 2. Continuation of FY17 effort to implement strategy in completing deferred software changes related to retirements, separations, selection board preparation, personnel appraisal, and personnel accountability that require development and modernization; and implement improved modernized personnel processes 3. In FY18, PAYMOD will complete its acquisition processes and award its first Task Order to develop increment 1, which focuses on creating a PeopleSoft Global Payroll baseline and implementing the initial modernized military pay capabilities. 4. Complete fit/gap analysis of the permeability functional requirements to personnel, pay, and authoritative data environment requirements. Solicit and award contract or task order and complete the System Requirements Review/System Functional Review (SRR/SFR).					
FY 2019 Base Plans: NP2 increase in FY19 is aligned with the Navy's MPT&E IT Transformation initiative to develop a technology component that forms an MPT&E Navy Personnel and Pay (NP2) system. Transformation activities will include conducting prototypes, testing, integration, and migration to a cloud environment. FY19 efforts include: 1. Continuation of the second Field Test. Software development life cycle activities to enable desired HR and Payroll operations in a production environment while developing the TDD capability. 2. Migrate field test to a secure and accredited commercial cloud hosting solution. The migration will allow a development environment for future field tests, prototypes, and pilot projects to help achieve Navy MPT&E Transformation objectives. 3. Complete NES and OPINS consolidation efforts. 4. Build MPT&E system functionality into a COTS Pay Modernization baseline, which will feed into modernized military personnel and pay capabilities and Active Component/Reserve Component (AC/RC) permeability. 5. Integration of Bi-Service PeopleSoft license with personnel and pay modernization solution.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
6. Define scope and minimum attributes for the PERS/PAY solution set 7. Develop level A/B/C functional requirements to address the Personnel, Payroll, and Audit business needs across MPT&E to support FOC PERS/PAY capabilities 8. Analyze DFAS payroll services/functions and determine feasibility to transition services to Navy ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase is due to development of Treasury Direct Disbursement (TDD) functionality within Navy Personnel and Pay system and migration to a cloud environment. The cost drivers are an increase in development and testing of an integrated personnel and pay solution with TDD.					
Title: Risk Management Information (RMI) ***Articles:*** ***FY 2018 Plans:*** 1. Complete design and implement Safety Program Management (SPM) configuration and interfaces. 2. Complete Phase I Analysis and Dissemination (A&D) to include configuration of SPM reports and metrics 3. Begin implementation of Phase II A&D. ***FY 2019 Base Plans:*** 1. Complete development of RMI Streamlined Incident Reporting (SIR) and Analysis and Dissemination (A&D) requirements 2. Begin acquisition planning of RMI Safety Program Management (SPM) and Single Point of Entry (SPOE) ***FY 2019 OCO Plans:*** N/A	2.169 -	1.100 -	1.100 -	0.000 -	1.100 -
Title: Authoritative Data Environment (ADE) ***Articles:*** ***FY 2018 Plans:*** 1. FY18 funds will be used for Phase 2 engineering design, development, testing and supporting infrastructure to incorporate additional MPTE data warehouse programs into the ADE baseline, expanding on the current Enterprise Service Bus (ESB) and application programming interface (API) tools.	3.891 -	9.800 -	10.000 -	0.000 -	10.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
2. FY18 will also procure data migration services to affect the moves of source data into the new enterprise baseline instance. ***FY 2019 Base Plans:*** 1. ADE Functional laboratory in the cloud environment. 2. ADE 2.0 architecture in the cloud and migrate the Navy Training Management Planning System (NTMPS) (as known as; ADE 1.5) data warehouse (DW) to the cloud. This is the first of nine legacy MPT&E data warehouses being consolidated into ADE. 3. Consolidate the Navy Personnel Database (NPDB) data warehouse into the ADE 2.0 environment. This is the second of nine legacy DWs being consolidated into ADE. 4. Consolidate Navy Manpower Program and Budget System (NMPBS) data warehouse into the ADE 2.0 environment. This is the third of nine legacy MPT&E DWs being consolidated into ADE. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is the result of consolidating three data warehouses into ADE and the primary cost driver is contract technical services.					
Title: Applicant Relationship Management (ARM)	4.398	0.556	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: 1. Conduct software requirement analyses leading up to Production Readiness Review (PRR) 2. Conduct regression testing for proper integration with earlier development efforts 3. Create improved audit management capability for increased efficiency 4. Provide enhanced user and data management capabilities to efficiently integrate Self Service Accessions Application (SSAA) 5. Complete ARM CRM pilots ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease is due to completion of ARM CRM pilots and transition to sustainment.					
Title: Recruiting Information System (NRIS)	0.000	0.200	0.000	0.000	0.000
Articles:	-	1	-	-	-
Description: The Recruiting Information System (NRIS) creates a holistic approach to Navy Accessions by integrating Recruiter and Applicant information in real-time and to appropriate Manpower, Personnel, Training, and Education DoD business systems. Combined with Mobile Recruiter Initiative (MRI), the NRIS family of web enabled systems extends the recruiting force point-of-presence and key business processes to the field; facilitates real-time data sharing and paperless processing across the Accessions supply chain; and drives down the total number of transactions required to transition from street to fleet. NRIS supports the active and reserve component, enlisted and officer accessions processes and includes system interfaces that eliminate multiple data entry and reduces errors. Interface partners include CeTARS (book school seats and initial strength gain), MIRS/eSOA (schedule applicants for physicals and testing at MEPS) and NSIPS (start the initial personnel record). NRIS encompasses PRIDE Modernization-I, WebRTools, CIRIMS and NASIS; and will include PRIDE Modernization-II and ARM when deployed in FY15. The NRIS architecture provides the recruiting force with an agile, flexible, secure, and data-centric IT operating environment, the key building block for business transformation and supports the command's RF2030 strategy. ***FY 2018 Plans:*** Start/complete modification of PRIDE MOD II and ARM interface with Career Waypoint. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Decrease of -0.2 from FY18 to FY19 is due to anticipated completion of PRIDE MOD II and ARM interface with Career Waypoint effort as planned. FY19 Baseline for NRIS effort is $0.					
Accomplishments/Planned Programs Subtotals	26.127	52.957	99.289	0.000	99.289

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 8106: *Command Support Equipment*	0.536	2.755	8.959	-	8.959	1.910	0.558	1.120	1.755	0.000	30.290
• 0604703N / PU 1822: *Personnel Training, Sim & Human Factors*	0.000	40.828	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	40.828

Remarks

BLI 8106 for NP2.
Research and Development Funds for MPT&E Transformation under PE 0604703N have been consolidated within PE 0605013N PU 2905 starting in FY19.

D. Acquisition Strategy

As a general rule IT development programs use an agile software development methodology therefore milestones, tasks and phases are often conducted in parallel vice sequentially.

BILLET BASED DISTRIBUTION (BBD)
The required services will be procured through a Cost Plus Fixed Fee (CPFF) 8a contract and a competitive, multiple award, small business Indefinite Delivery / Indefinite Quantity (ID/IQ) contract task order.

LEARNING MANAGEMENT SYSTEM - DISTANCE LEARNING (LMS-DL)
Use existing GWAC or competitive contract for any new product sourcing, use existing Bi-Service PeopleSoft license, Indefinite Delivery/Indefinite Quantity contract vehicles within PMW 240 for additional design and integration services. Investigate option of using an Interagency Agreement for an Assisted Acquisition with the Office of Personnel Management's USA Learning program.

NAVY PERSONNEL AND PAY SYSTEM (NP2)

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

NP2 will incrementally implement Navy's personnel and pay modernization strategy using a variety of IDIQ contract task orders. These task orders will use commercial off the shelf (COTS) software (PeopleSoft Global Payroll and PeopleSoft General Ledger) to extend the Navy Personnel and Pay (NP2) functionality based on PeopleSoft Human Capital Management.

MY NAVY PORTAL (MNP)
The required services will be procured through a competitive small business Indefinite Delivery / Indefinite Quantity (ID/IQ) Cost Plus Fixed Fee (CPFF) 8a contract.

NAVY MANPOWER REQUIREMENTS SYSTEM (NMRS)
The required services will be procured through a Cost Plus Fixed Fee (CPFF) task order awarded on a competitive, multiple award, small business Indefinite Delivery / Indefinite Quantity (ID/IQ) contract.

RISK MANAGEMENT INFORMATION (RMI)
There are existing Commercial-Off-the-Shelf (COTS) software and services that, with customization, can fill the Navy's documentation requirements and generate safety reporting of the United States Naval forces. These services will be procured through an 8A CPFF contract.

The Navy plans to leverage Contractor developed safety-related products by using a modular contracting approach to implement and combine capabilities from the following systems.

(a) Streamlined Incident Reporting (SIR)
(b) Single Point of Entry (SPOE)
(c) Safety Program Management (SPM);
(d) Analysis & Dissemination (A&D)

AUTHORITATIVE DATA ENVIRONMENT (ADE)
The required services will be procured through multiple Cost Plus Fixed Fee (CPFF) task orders awarded on a competitive, multiple award, small business Indefinite Delivery / Indefinite Quantity (ID/IQ) contract for PMW 240 enterprise services, and also on a competitive, single award, large business Indefinite Delivery / Indefinite Quantity (ID/IQ) contract for tasking related to personnel and pay modernization.

APPLICANT RELATIONSHIP MANAGEMENT (ARM)
CPFF contract using GOTS software solution.
(U) PERSTEMPO: Expect to use existing systems and build applications in those environments. Specifically for ITEMPO related costing, system resources are already existing within other system budget lines, and the OMN structure has been increased from FY2016 through the FYDP to sustain these changes. For Deployment Health Location, best system will be determined to host these attributes once the FRD is completed. For software development, the existing contract vehicles will be used, managing the work through separate sub contract line items (SLINs). Existing test resources will be used for testing software modifications.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

E. Performance Metrics

BILLET BASED DISTRIBUTION (BBD)
Concurrent Users: 250 Users
Screen Refresh: 6-20 Seconds
System Recoverability: <=4 Hrs
System Interoperability: 95%
System Availability: >=95%

LEARNING MANAGEMENT SYSTEM - DISTANCE LEARNING (LMS-DL)
Capturing end user screen refresh latency as compared to current system benchmarks for on-line courses.
Identifying all integration points, failure modes and data flows required for the additional technology and approach
Identifying supply chain, instructional, and student management business process changes needed to employ the technology
Assessing server utilization and physical architecture projections (#s and types of hardware/SW/network appliances) needed for full scale use of the technology.

ANALYSIS OF ALTERNATIVE/ECONOMIC ANALYSIS (AOA)
Produce assessments for 95% of required AoAs.

NAVY PERSONNEL AND PAY SYSTEM (NP2)
The system shall allow role-based access to SSN and/or masked SSN in accordance with Personally Identifiable Information (PII) instructions 100% of the time.
The system shall have a retrieval or generation of data entry/navigation screen within 4 seconds for 90% of transactions.
System maintainability - Failures or unplanned outages shall be restored within 4 hours.
The system shall have sufficient capacity to handle anticipated user demand based on increased functionality and accessibility for at least 12,000 simultaneous users.
Data consistency - The system shall produce consistent reports when a query is duplicated using identical user-selected parameters, to include the specific timestamp of the query. System will be within 99% accuracy in replicating the report content.
Data accuracy - The system shall generate forms and accurately populate them with authoritative source data with greater than 99% accuracy between the data auto-populated forms and the data contained within the system.

MY NAVY PORTAL (MNP)
MNP will meet acquisition program and system engineering and technical review milestones for development with no outstanding severity 1-3 defects prior to production release. The portal will manage at least 50,000 concurrent actions per hour and 200,000 concurrent users per hour.

NAVY MANPOWER REQUIREMENTS SYSTEM (NMRS)
Security- No identified / open findings without documentation of implemented mitigations and a remediation plan. No residual CAT I findings, or risk aggregation to CAT I.
Concurrent Users - A minimum of 35 concurrent users without degradation of system performance.

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Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

Transactions - 98% of transactions completed successfully
System Reliability - Edit failures transmitted data that are not detected automatically and require field level manual intervention to correct in less than 2% of all transactions.
System Availability - Available 95% of the time.
Reporting - System must generate, populate, and display simple reports within ten seconds and complex reports within two minutes.
Queries - System must have the ability to execute simple queries within ten seconds and complex queries within fifteen seconds.
Screen Refresh - System shall have the ability to perform a screen refresh invoked by the user within fifteen seconds of submission.
Navigation - System shall have the ability to navigate between hierarchy levels while utilizing the map within ten seconds of each instance of level change.

RISK MANAGEMENT INFORMATION (RMI)
Safety Incident Reporting Functionality - The system shall provide the ability to utilize RMI mishap, near mishap, and hazard initial notification, report drafting, report submission, report endorsement, and mishap recommendation / action item response and tracking functionality for at least 95% of Navy and Marine Corps operational ground forces, shore commands, surface forces, aviation forces, and submarine forces
Incident Data Capture - The system shall capture safety incident report data 100% of the time.
Security - The system shall protect flagged Safety Privilege, Personally Identifiable Information (PII), and Protected Health Information (PHI), and allow only role-based access in accordance with law, regulation and policy (LRP) instructions. 100% of flagged Safety Privilege, PII, and PHI data shall be protected from unauthorized roles and tacit export.
Registered Users - The system shall support user account access for Navy and Marine Corps members and safety support users for all safety user types = (administrative, power, occasional, and infrequent)
Concurrent Active Users - The system shall have sufficient capacity to support concurrent active users or greater than 20% of all safety users.
Response Time - Data requests/queries, reports, building of custom views, etc. shall not significantly impact transaction processing time. All items will be processed within 1 second or less for 90% of requests and 3 seconds or less for 10% of single record requests.

AUTHORITATIVE DATA ENVIRONMENT (ADE)
The system shall provide an audit trail for all system transactions.
The system shall transfer data payloads of up to 1 megabyte (MB) among services.
The system shall transfer data transactions of up to 1 MB among applications.
The system shall allow any authorized application or system to insert data.
The system shall provide CAC-enabled login for identity management.

APPLICANT RELATIONSHIP MANAGEMENT (ARM)
The system shall have the ability to perform simple queries and present data to the user within five seconds upon submission.
ARM shall have no architectural limitations that would preclude a minimum of 5,000 concurrent users.
The system response time will support an experienced classifier making at least ten classifications per hour.
The ARM system shall auto save information entered by a recruiter while the information is being entered without degradation of system responsiveness.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

(U) 2905 PERSTEMPO: Meet program system engineering and technical review milestones for development with no outstanding severity 1-3 defects for production release.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 2905 / *BUPERS IT*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
BBD Phase 1c Increment 1 and 2, Phasde 2	C/CPFF	SSC, INC : New Orleans, LA	9.545	2.140	Dec 2016	4.860	Dec 2017	4.800	Dec 2018	-		4.800	Continuing	Continuing	Continuing
LMS-DL Pilot and Career Profile Management	C/CPFF	OPM : Pensacola, FL	1.801	2.000	Jun 2017	5.606	Jun 2018	6.469	Jun 2019	-		6.469	Continuing	Continuing	Continuing
MNP/SPOE/CRM/MNCC	C/CPFF	Katmai : Arlington, VA	10.155	3.269	Nov 2016	4.290	Jul 2018	11.145	Jul 2019	-		11.145	Continuing	Continuing	Continuing
TFMMS Design, Development, Test & Deployment (2 Increments)	C/CPFF	A3IS : Palm Coast, FL	6.619	0.000		0.000		0.000		-		0.000	0.000	6.619	Continuing
PRIDE MOD II Design, Development, Test & Deployment	C/CPFF	CGI, Fed : Washington, DC	2.185	0.000		0.000		0.000		-		0.000	0.000	2.185	1.370
AOA Design, Development, Test & Deployment	C/CPFF	CSRA : New Orleans, LA	0.992	0.800	Mar 2017	0.700	Mar 2018	0.500	Mar 2019	-		0.500	Continuing	Continuing	Continuing
NP2 Transformation	C/CPFF	CSRA : Washington, DC	9.816	3.912	Jan 2017	20.154	Jan 2018	59.970	Jan 2019	-		59.970	Continuing	Continuing	Continuing
NMRS Design, Development, Test & Deployment	C/CPFF	Millienium : New Orleans, LA	0.000	0.262	Aug 2017	2.000	May 2018	1.500	May 2019	-		1.500	Continuing	Continuing	Continuing
RMI SIR/SPOE/SPM/A&D Design, Development, Test & Deployment	C/CPFF	Syneren : Arlington, VA	5.890	2.761	Jun 2017	1.100	Jul 2018	1.100	Jun 2019	-		1.100	Continuing	Continuing	Continuing
ADE - BI / Visualization / Analytics Products	C/CPFF	CSRA : Washington, D.C.	0.000	3.500	Aug 2017	5.500	Aug 2018	5.600	Aug 2019	-		5.600	Continuing	Continuing	Continuing
ADE - System Integration	C/CPFF	Millenium : Washington, D.C.	0.000	1.200	Jul 2017	4.300	Jul 2018	4.400	Jul 2019	-		4.400	Continuing	Continuing	Continuing
ARM Phase 1-3 Design, Development, Test & Deployment	C/CPFF	HP : Orlando, FL	0.000	2.700	Dec 2016	0.556	Dec 2017	0.000		-		0.000	0.000	3.256	2.221
PERSTEMPO System Design, Engineering, and Development	C/CPFF	FLC Philadelphia : Philadelphia, PA	1.024	0.000		0.000		0.000		-		0.000	0.000	1.024	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Recruiting Information System (NRIS)	C/CPFF	CGI Federal, Inc : Fairfax, VA	0.240	0.000		0.200	Jan 2018	0.000		-		0.000	0.000	0.440	-
		Subtotal	48.267	22.544		49.266		95.484		-		95.484	Continuing	Continuing	N/A

Remarks

Contract award dates in FY19 are scheduled option awards of existing base contracts and do not indicate late contract obligation and expenditures.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NSIPS Bi-Service License	C/CPFF	Oracle : Redwood City, CA	9.623	3.583	Dec 2016	3.691	Dec 2017	3.805	Dec 2018	-		3.805	Continuing	Continuing	Continuing
		Subtotal	9.623	3.583		3.691		3.805		-		3.805	Continuing	Continuing	N/A

Remarks

NP2 pays the Navy's share of the Bi-Service PeopleSoft license.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	57.890	26.127		52.957		99.289		-		99.289	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

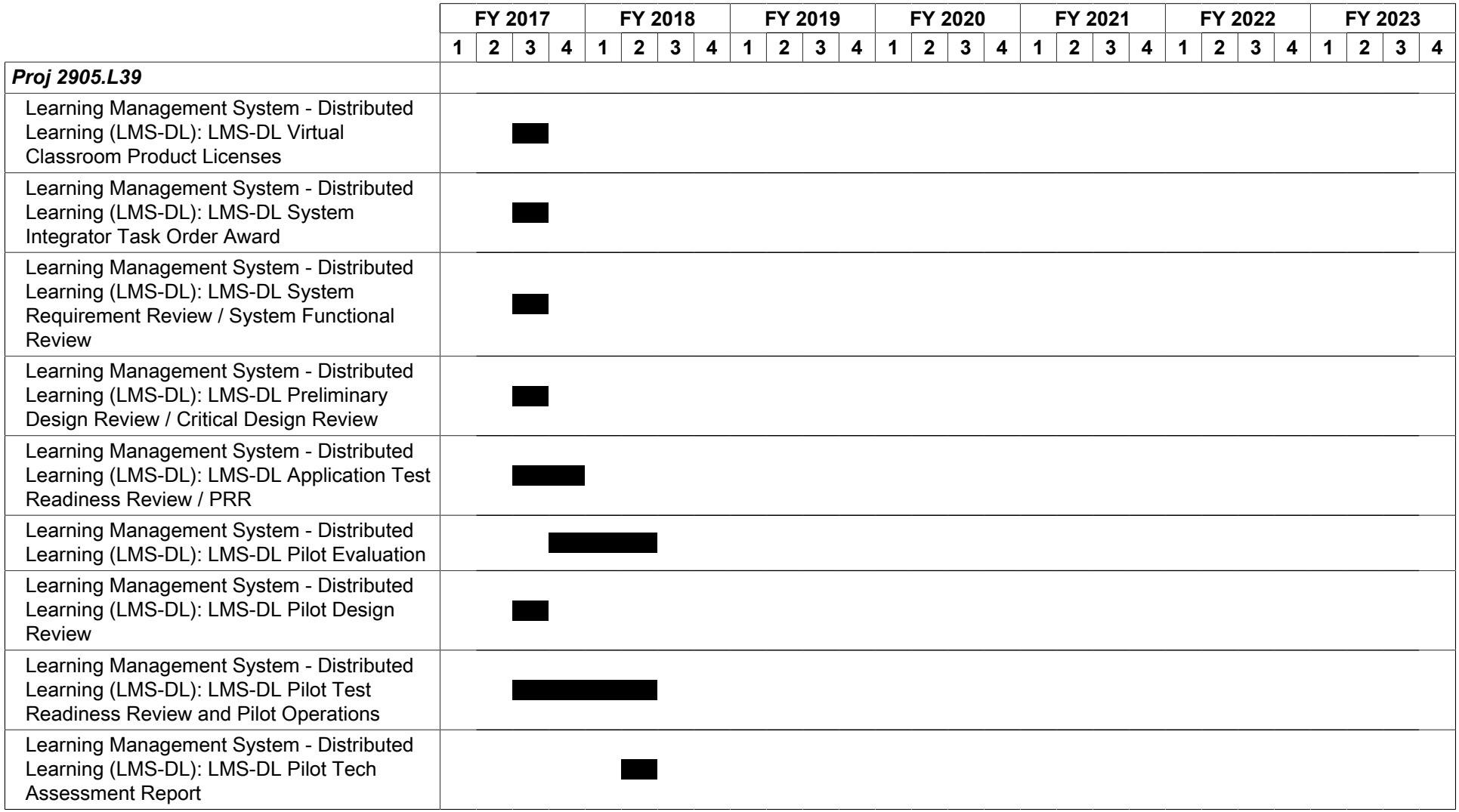

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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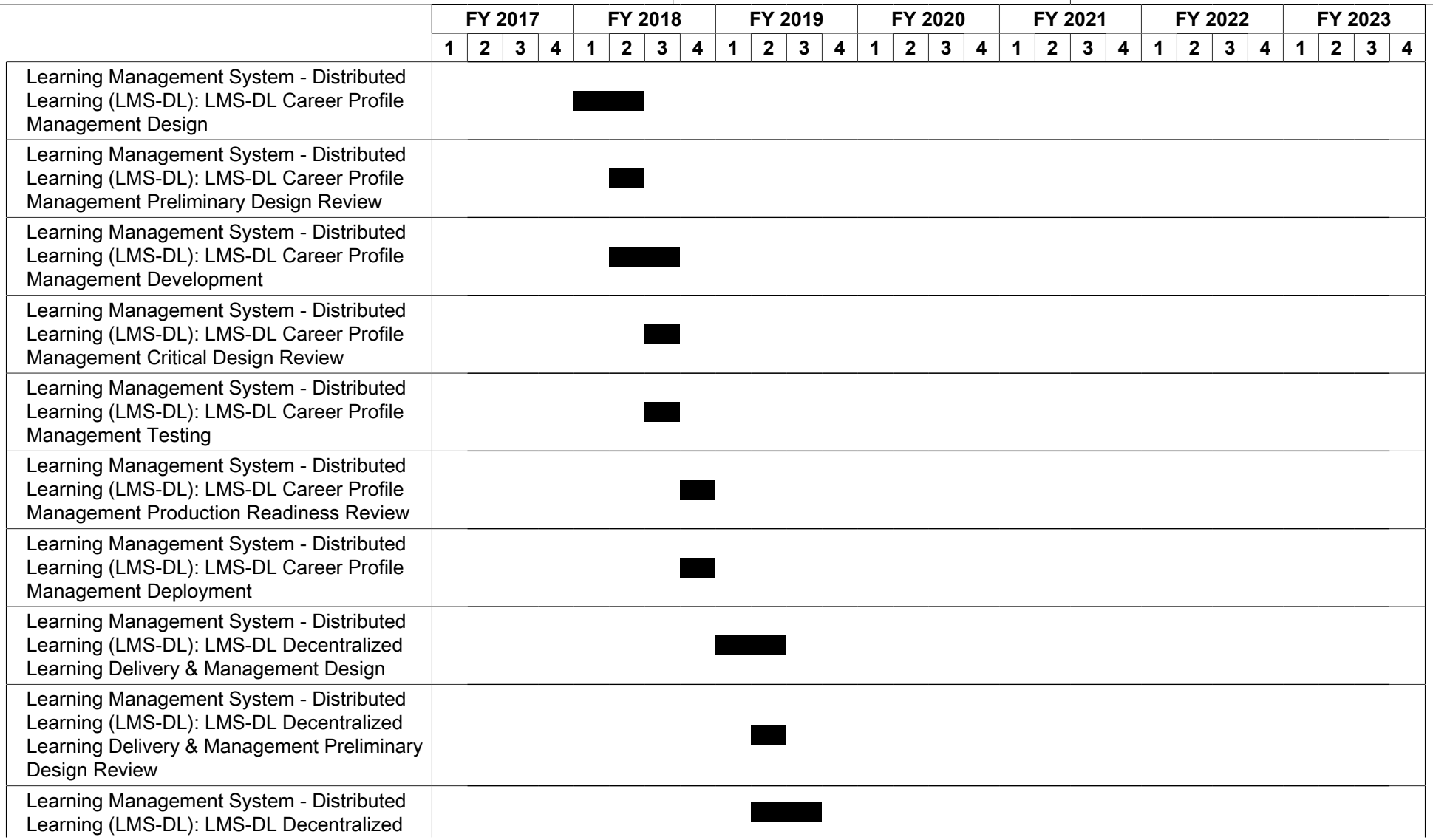

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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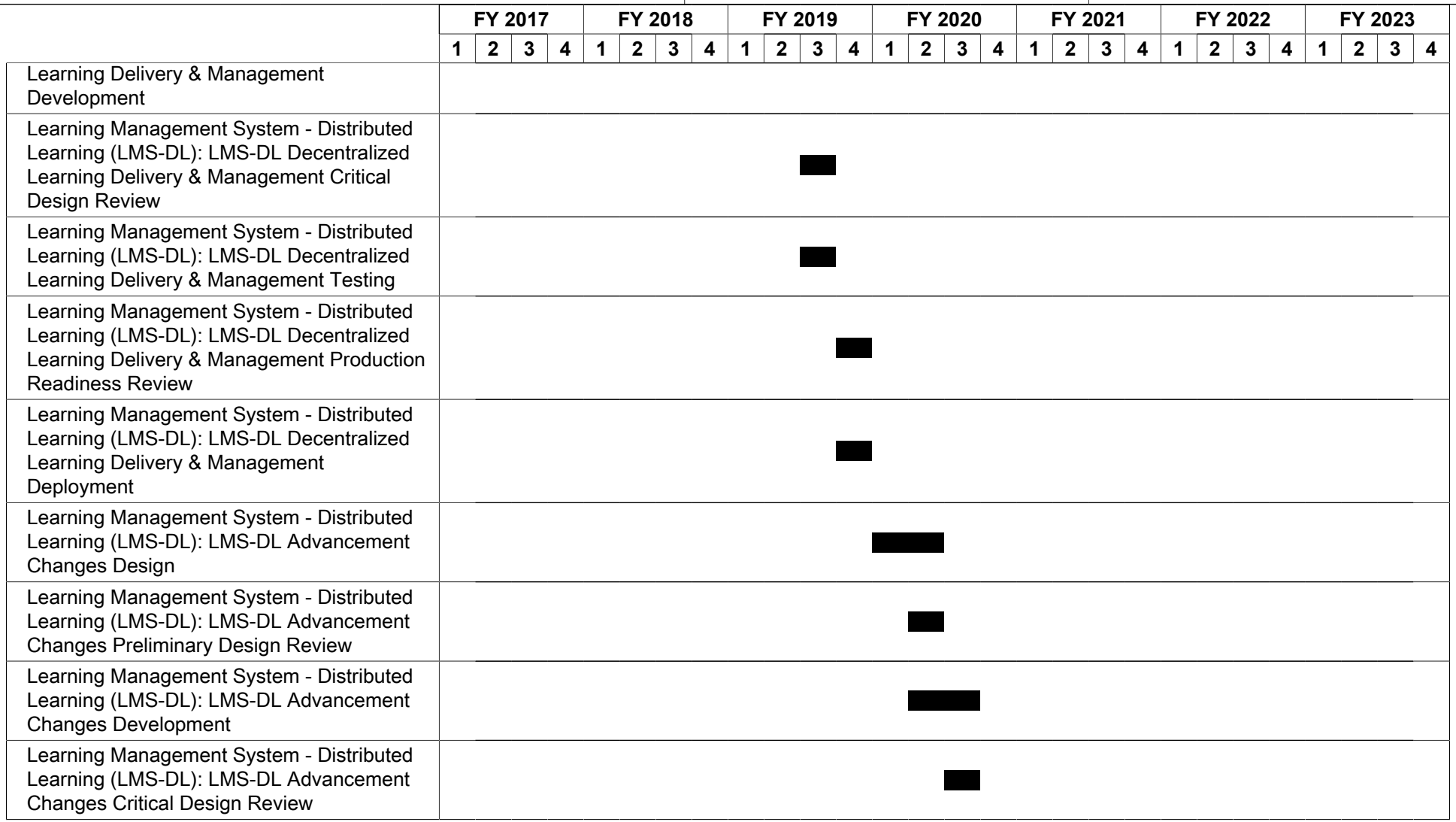

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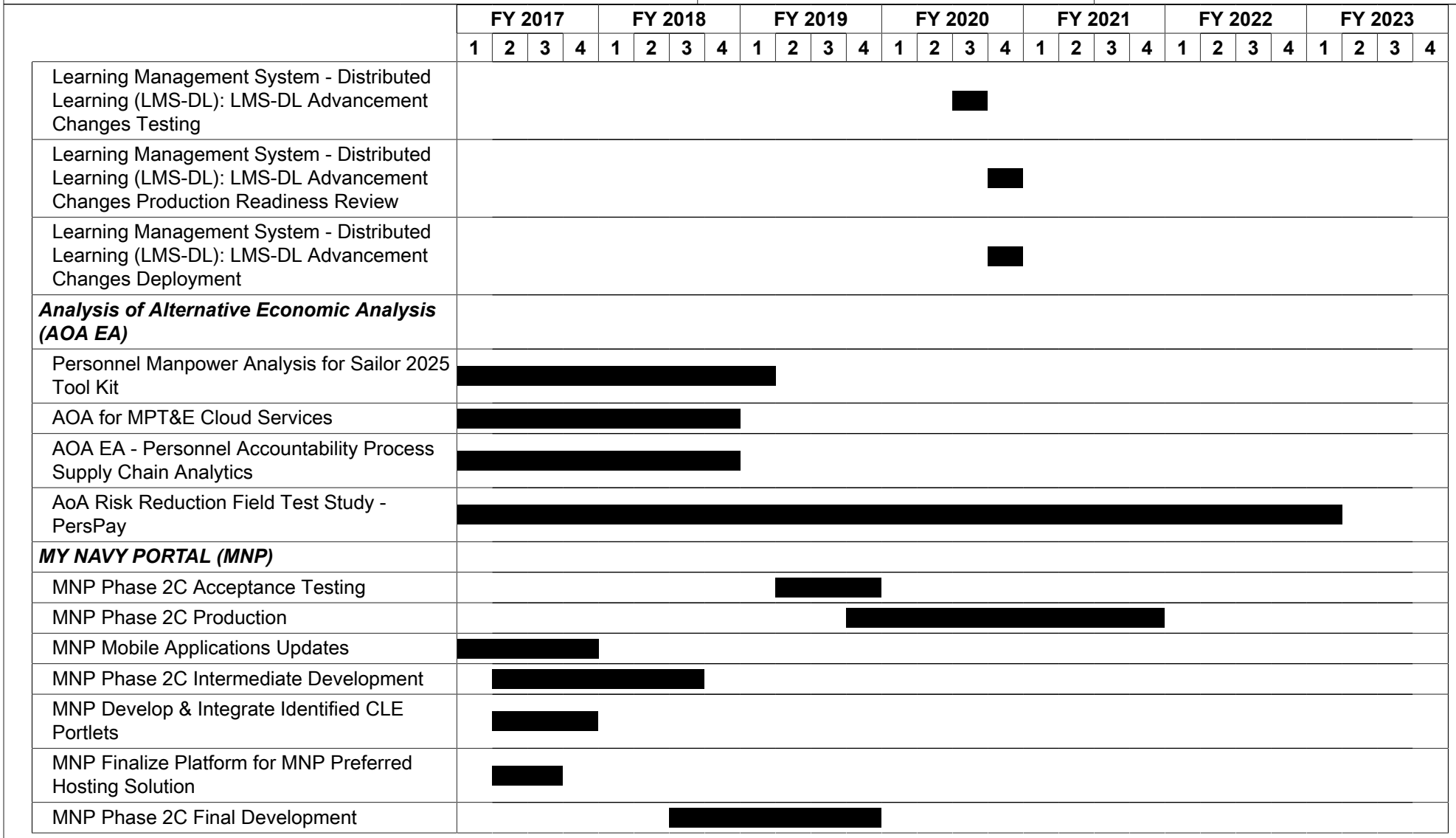

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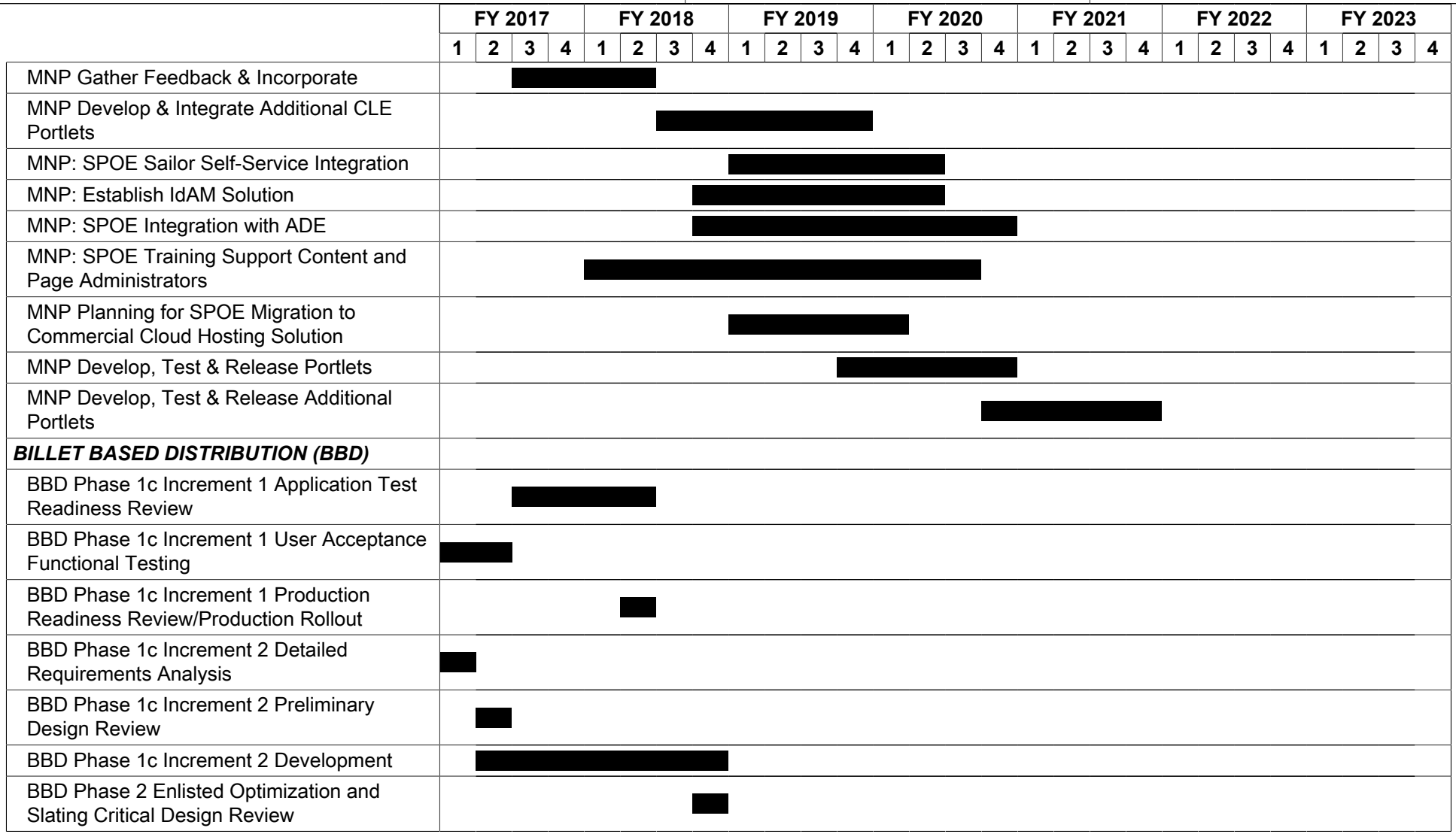

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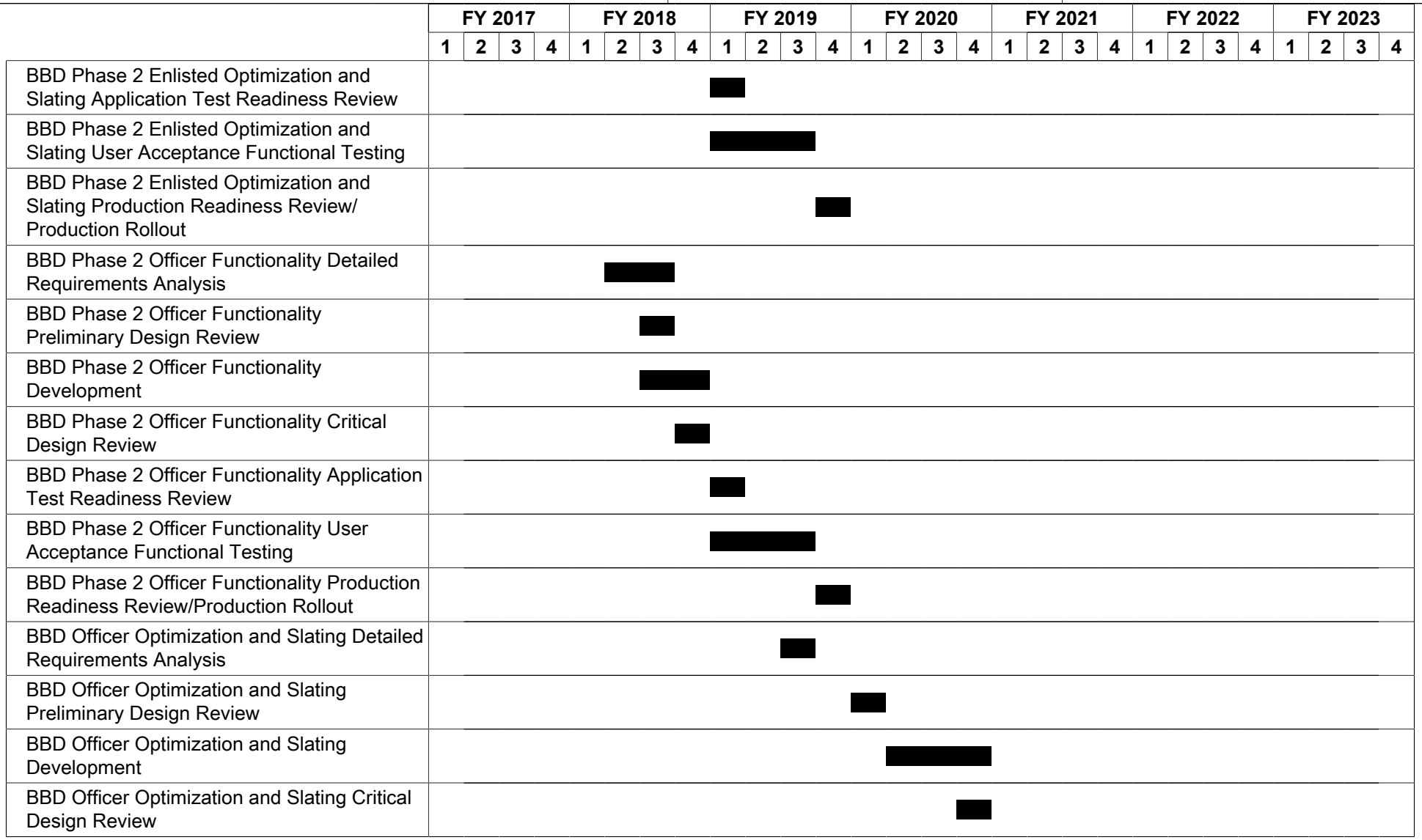

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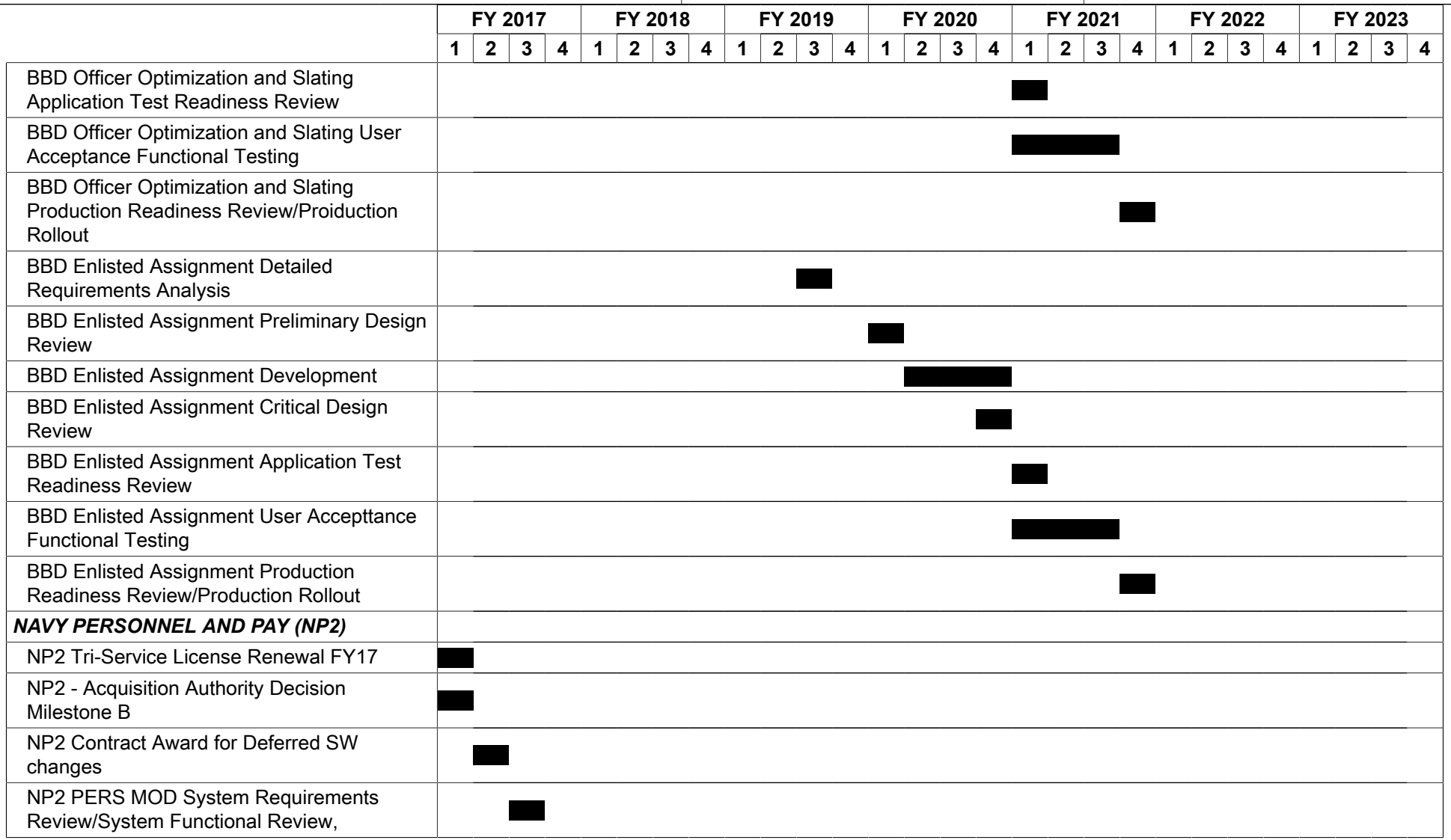

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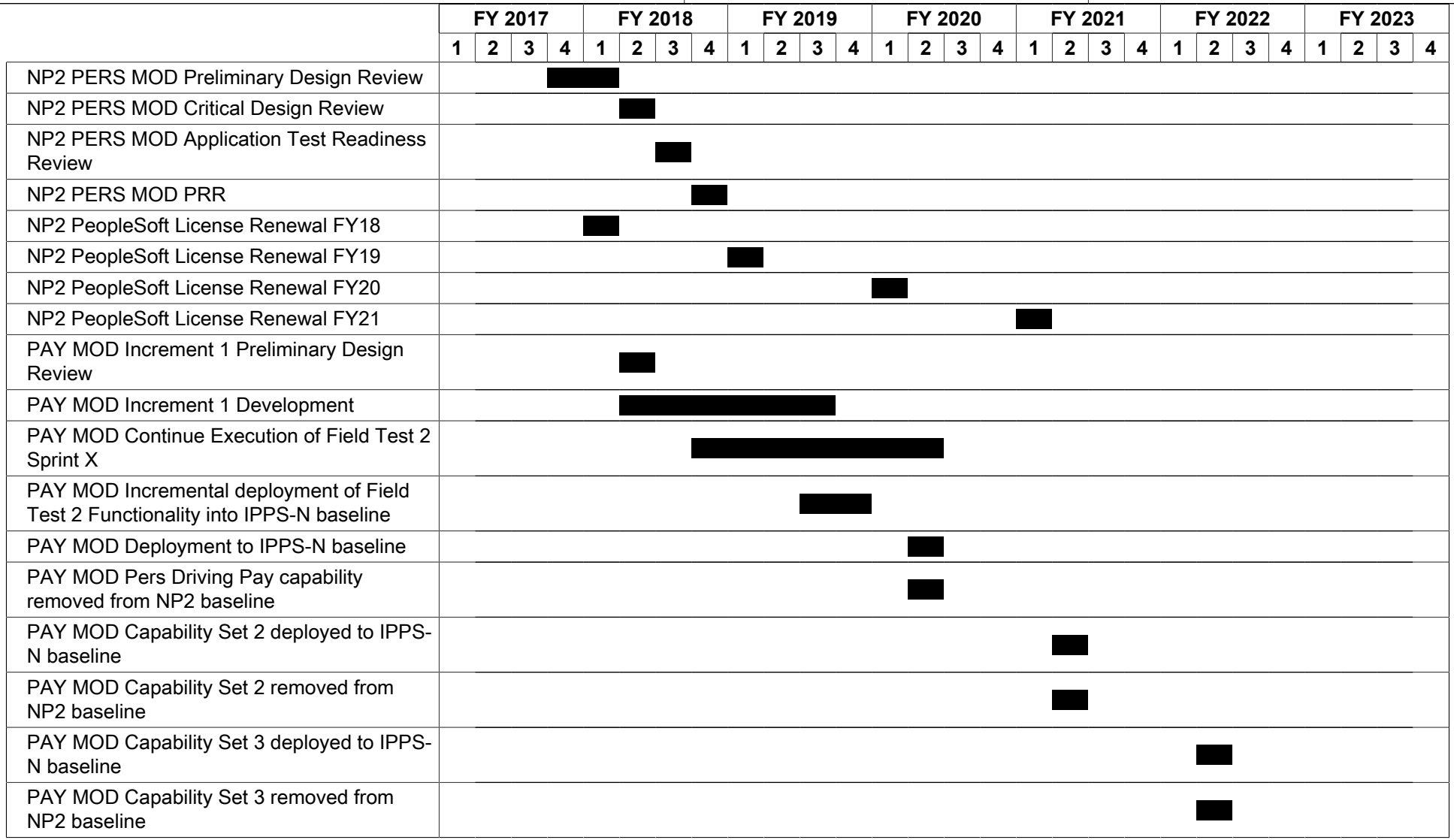

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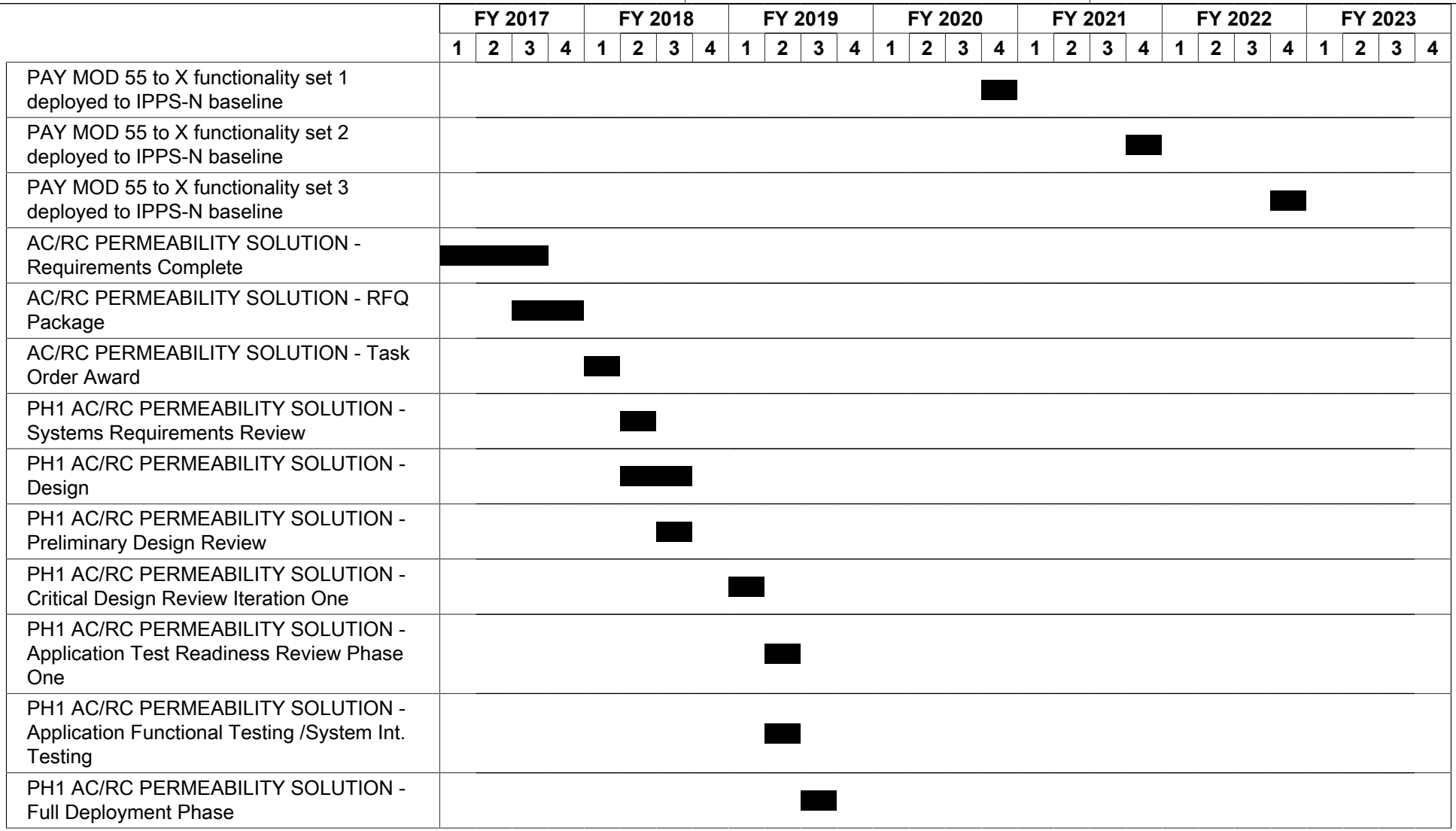

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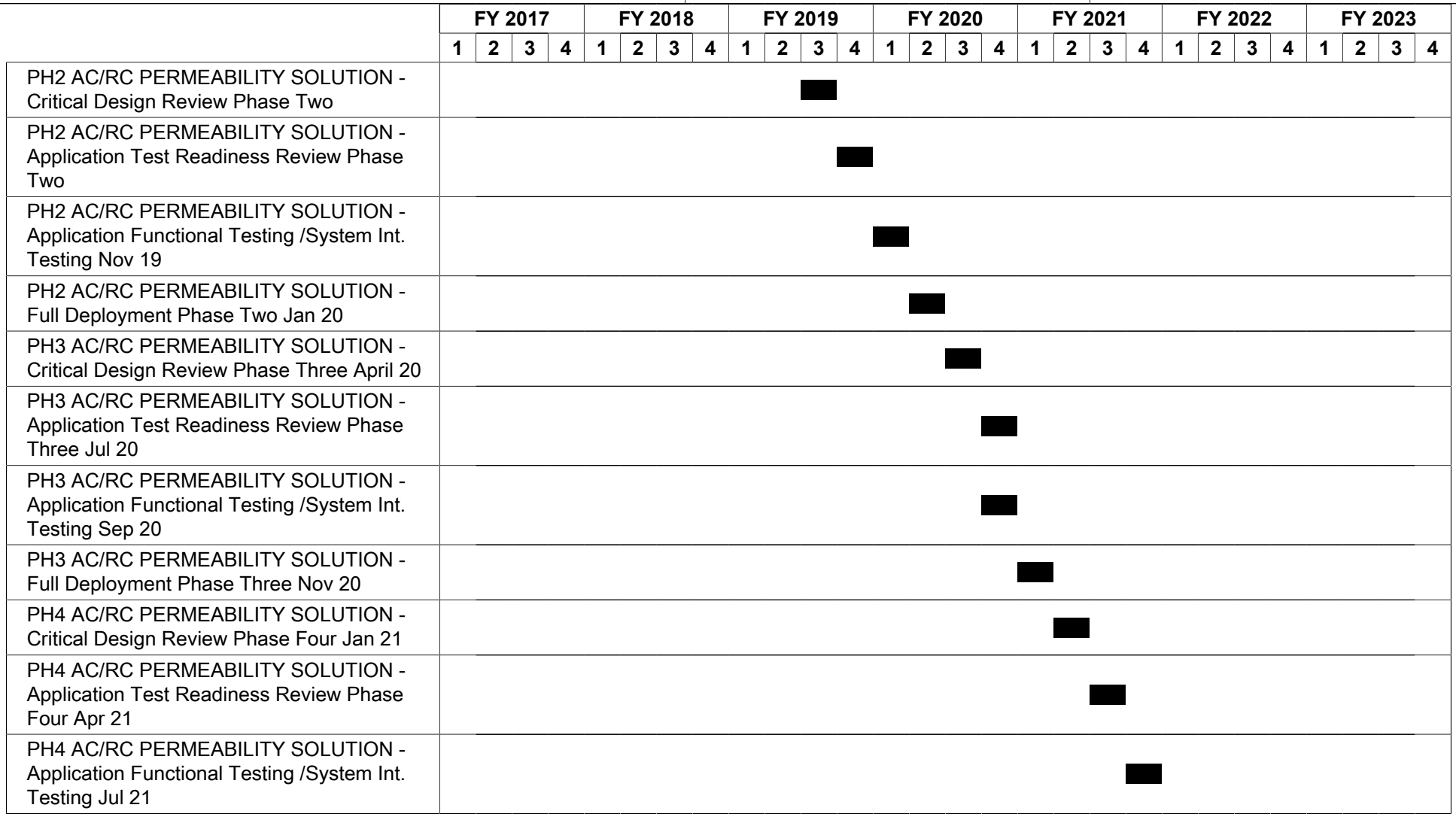

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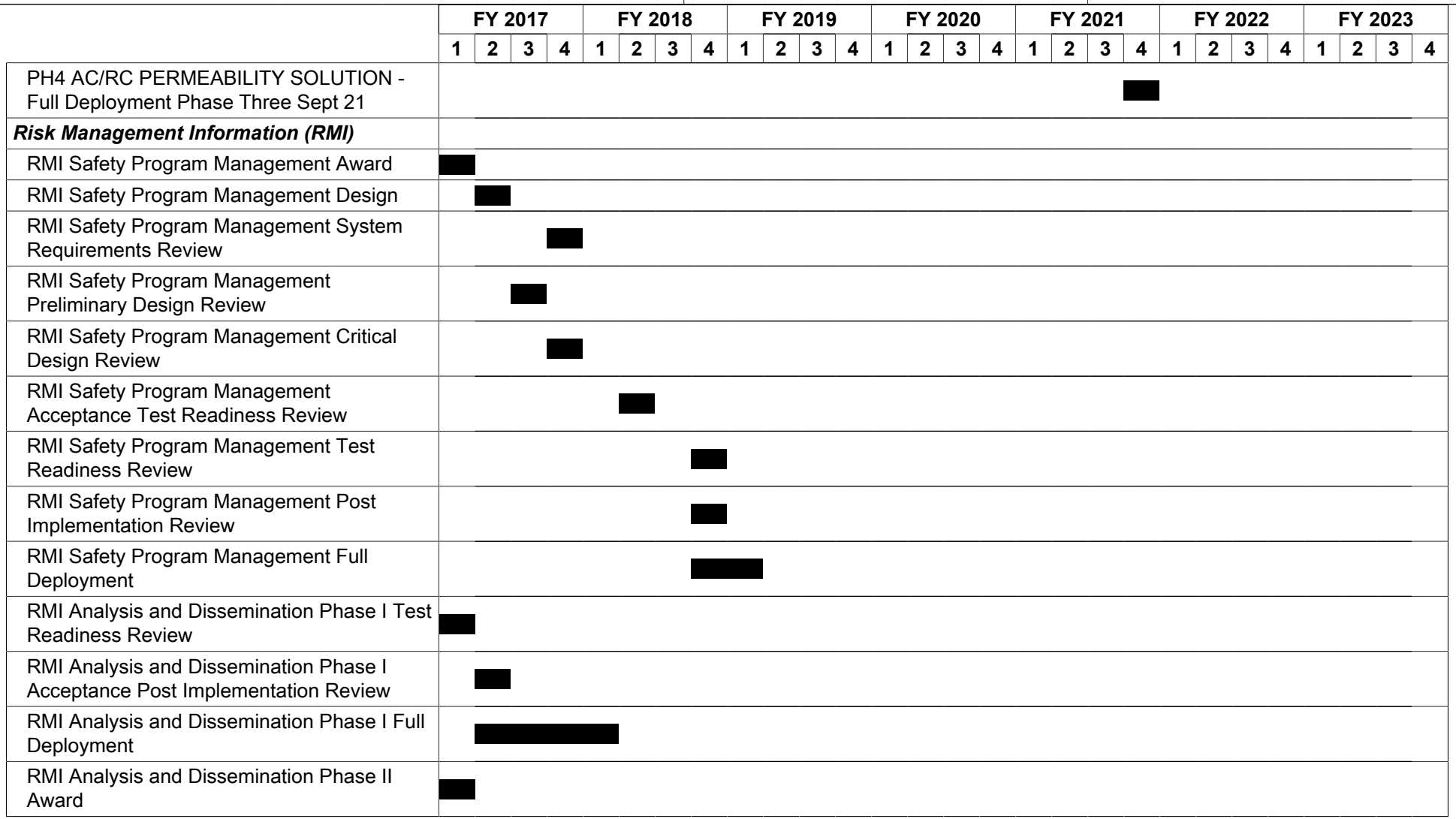

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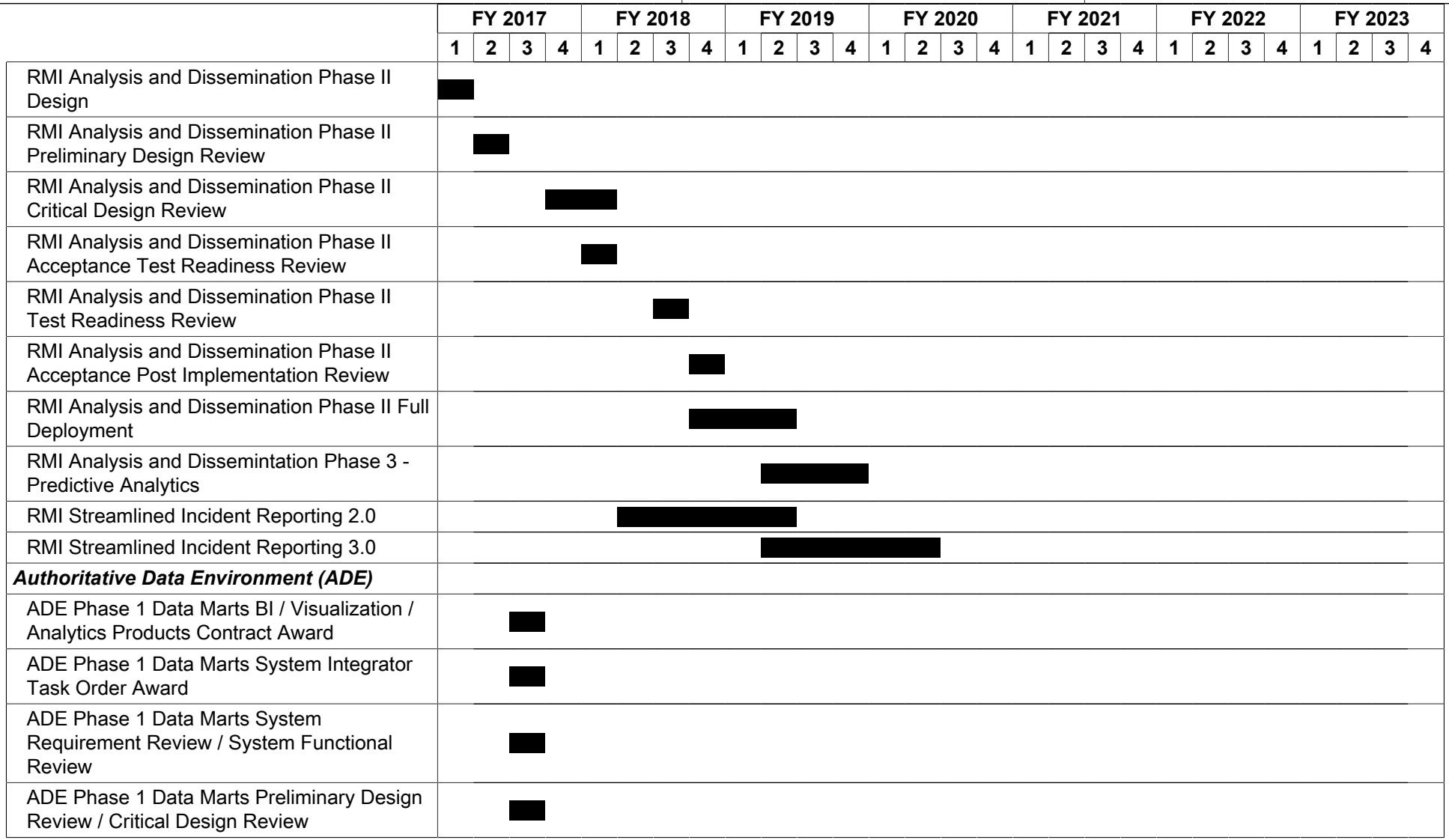

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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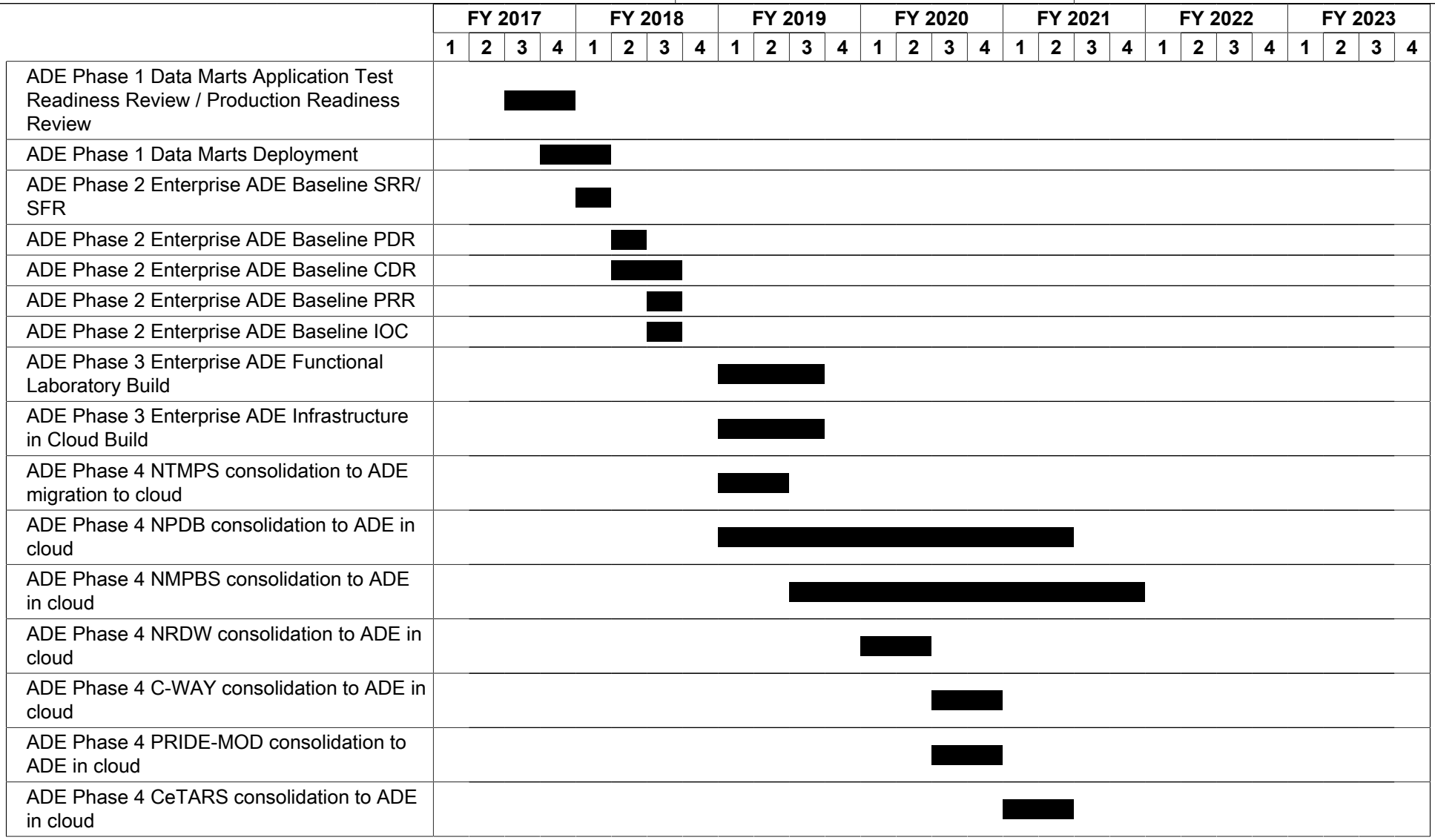

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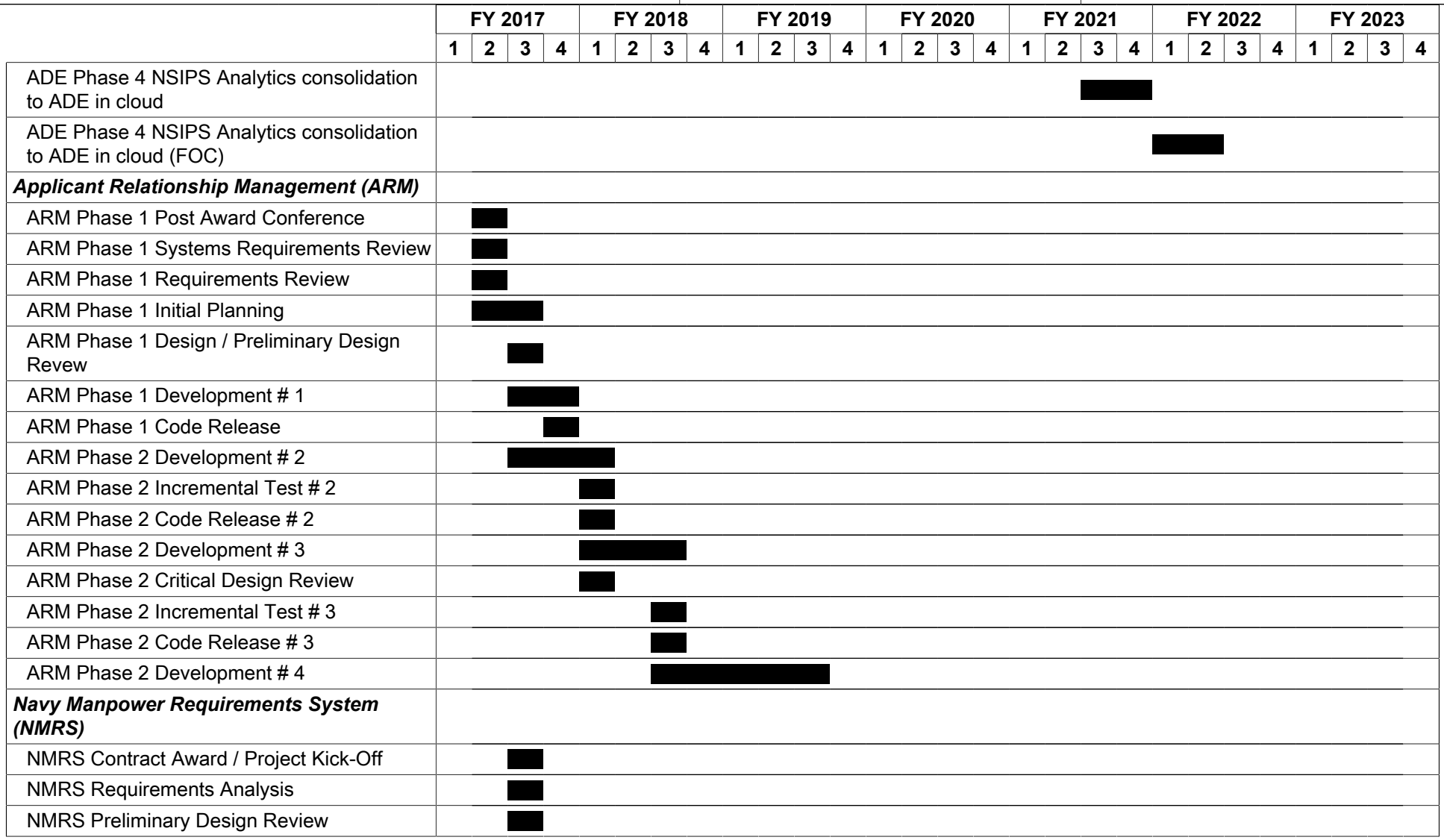

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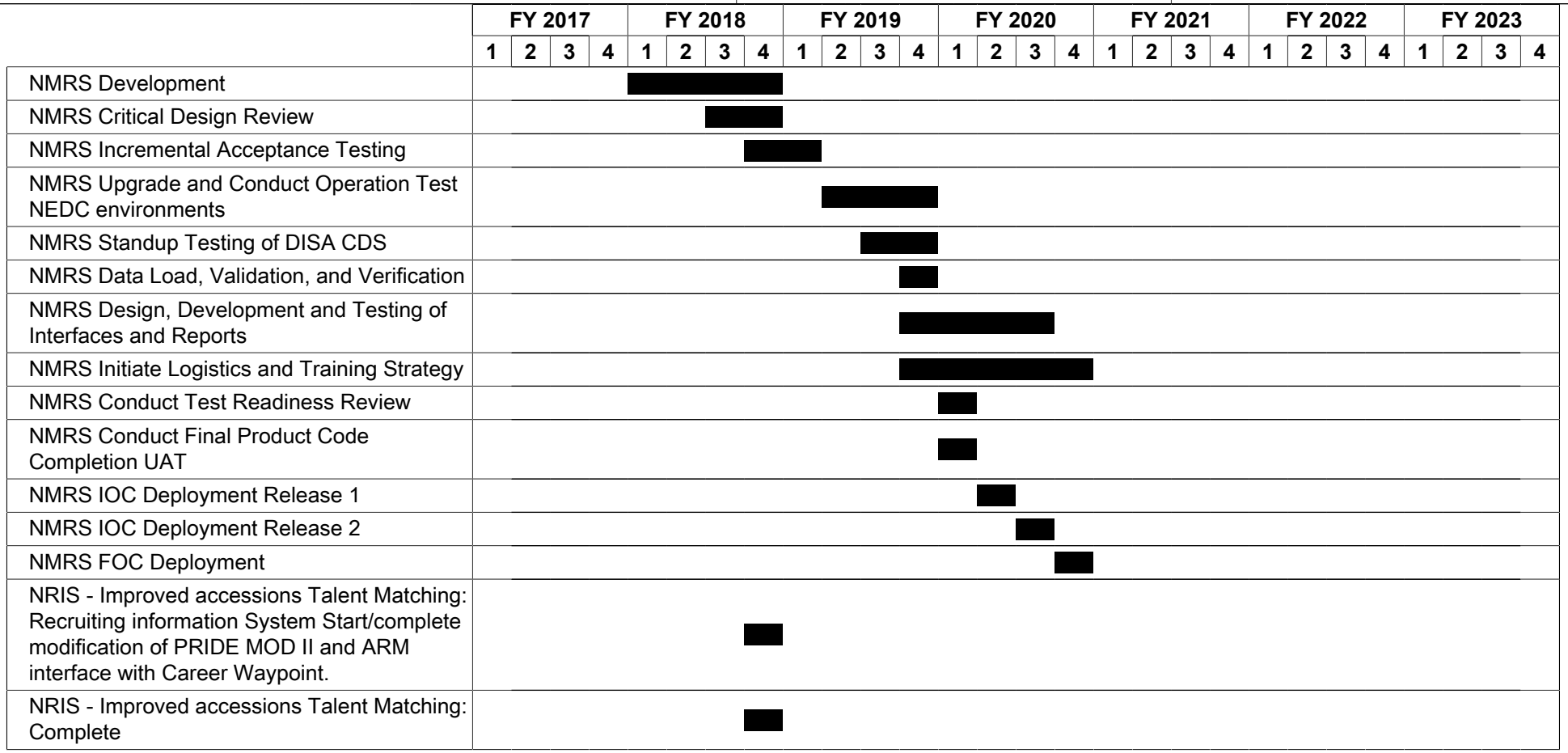


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 2905.L39				
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Virtual Classroom Product Licenses	3	2017	3	2017
Learning Management System - Distributed Learning (LMS-DL): LMS-DL System Integrator Task Order Award	3	2017	3	2017
Learning Management System - Distributed Learning (LMS-DL): LMS-DL System Requirement Review / System Functional Review	3	2017	3	2017
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Preliminary Design Review / Critical Design Review	3	2017	3	2017
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Application Test Readiness Review / PRR	3	2017	4	2017
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Pilot Evaluation	4	2017	2	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Pilot Design Review	3	2017	3	2017
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Pilot Test Readiness Review and Pilot Operations	3	2017	2	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Pilot Tech Assessment Report	2	2018	2	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Career Profile Management Design	1	2018	2	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Career Profile Management Preliminary Design Review	2	2018	2	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Career Profile Management Development	2	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Career Profile Management Critical Design Review	3	2018	3	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Career Profile Management Testing	3	2018	3	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Career Profile Management Production Readiness Review	4	2018	4	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Career Profile Management Deployment	4	2018	4	2018
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Decentralized Learning Delivery & Management Design	1	2019	2	2019
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Decentralized Learning Delivery & Management Preliminary Design Review	2	2019	2	2019
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Decentralized Learning Delivery & Management Development	2	2019	3	2019
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Decentralized Learning Delivery & Management Critical Design Review	3	2019	3	2019
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Decentralized Learning Delivery & Management Testing	3	2019	3	2019
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Decentralized Learning Delivery & Management Production Readiness Review	4	2019	4	2019
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Decentralized Learning Delivery & Management Deployment	4	2019	4	2019
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Advancement Changes Design	1	2020	2	2020
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Advancement Changes Preliminary Design Review	2	2020	2	2020
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Advancement Changes Development	2	2020	3	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Advancement Changes Critical Design Review	3	2020	3	2020
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Advancement Changes Testing	3	2020	3	2020
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Advancement Changes Production Readiness Review	4	2020	4	2020
Learning Management System - Distributed Learning (LMS-DL): LMS-DL Advancement Changes Deployment	4	2020	4	2020
Analysis of Alternative Economic Analysis (AOA EA)				
Personnel Manpower Analysis for Sailor 2025 Tool Kit	1	2017	1	2019
AOA for MPT&E Cloud Services	1	2017	4	2018
AOA EA - Personnel Accountability Process Supply Chain Analytics	1	2017	4	2018
AoA Risk Reduction Field Test Study - PersPay	1	2017	1	2023
MY NAVY PORTAL (MNP)				
MNP Phase 2C Acceptance Testing	2	2019	4	2019
MNP Phase 2C Production	4	2019	4	2021
MNP Mobile Applications Updates	1	2017	4	2017
MNP Phase 2C Intermediate Development	2	2017	3	2018
MNP Develop & Integrate Identified CLE Portlets	2	2017	4	2017
MNP Finalize Platform for MNP Preferred Hosting Solution	2	2017	3	2017
MNP Phase 2C Final Development	3	2018	4	2019
MNP Gather Feedback & Incorporate	3	2017	2	2018
MNP Develop & Integrate Additional CLE Portlets	3	2018	4	2019
MNP: SPOE Sailor Self-Service Integration	1	2019	2	2020
MNP: Establish IdAM Solution	4	2018	2	2020
MNP: SPOE Integration with ADE	4	2018	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MNP: SPOE Training Support Content and Page Administrators	1	2018	3	2020
MNP Planning for SPOE Migration to Commercial Cloud Hosting Solution	1	2019	1	2020
MNP Develop, Test & Release Portlets	4	2019	4	2020
MNP Develop, Test & Release Additional Portlets	4	2020	4	2021
BILLET BASED DISTRIBUTION (BBD)				
BBD Phase 1c Increment 1 Application Test Readiness Review	3	2017	2	2018
BBD Phase 1c Increment 1 User Acceptance Functional Testing	1	2017	2	2017
BBD Phase 1c Increment 1 Production Readiness Review/Production Rollout	2	2018	2	2018
BBD Phase 1c Increment 2 Detailed Requirements Analysis	1	2017	1	2017
BBD Phase 1c Increment 2 Preliminary Design Review	2	2017	2	2017
BBD Phase 1c Increment 2 Development	2	2017	4	2018
BBD Phase 2 Enlisted Optimization and Slating Critical Design Review	4	2018	4	2018
BBD Phase 2 Enlisted Optimization and Slating Application Test Readiness Review	1	2019	1	2019
BBD Phase 2 Enlisted Optimization and Slating User Acceptance Functional Testing	1	2019	3	2019
BBD Phase 2 Enlisted Optimization and Slating Production Readiness Review/ Production Rollout	4	2019	4	2019
BBD Phase 2 Officer Functionality Detailed Requirements Analysis	2	2018	3	2018
BBD Phase 2 Officer Functionality Preliminary Design Review	3	2018	3	2018
BBD Phase 2 Officer Functionality Development	3	2018	4	2018
BBD Phase 2 Officer Functionality Critical Design Review	4	2018	4	2018
BBD Phase 2 Officer Functionality Application Test Readiness Review	1	2019	1	2019
BBD Phase 2 Officer Functionality User Acceptance Functional Testing	1	2019	3	2019
BBD Phase 2 Officer Functionality Production Readiness Review/Production Rollout	4	2019	4	2019
BBD Officer Optimization and Slating Detailed Requirements Analysis	3	2019	3	2019
BBD Officer Optimization and Slating Preliminary Design Review	1	2020	1	2020
BBD Officer Optimization and Slating Development	2	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
BBD Officer Optimization and Slating Critical Design Review	4	2020	4	2020
BBD Officer Optimization and Slating Application Test Readiness Review	1	2021	1	2021
BBD Officer Optimization and Slating User Acceptance Functional Testing	1	2021	3	2021
BBD Officer Optimization and Slating Production Readiness Review/Proiduction Rollout	4	2021	4	2021
BBD Enlisted Assignment Detailed Requirements Analysis	3	2019	3	2019
BBD Enlisted Assignment Preliminary Design Review	1	2020	1	2020
BBD Enlisted Assignment Development	2	2020	4	2020
BBD Enlisted Assignment Critical Design Review	4	2020	4	2020
BBD Enlisted Assignment Application Test Readiness Review	1	2021	1	2021
BBD Enlisted Assignment User Accepttance Functional Testing	1	2021	3	2021
BBD Enlisted Assignment Production Readiness Review/Production Rollout	4	2021	4	2021
NAVY PERSONNEL AND PAY (NP2)				
NP2 Tri-Service License Renewal FY17	1	2017	1	2017
NP2 - Acquisition Authority Decision Milestone B	1	2017	1	2017
NP2 Contract Award for Deferred SW changes	2	2017	2	2017
NP2 PERS MOD System Requirements Review/System Functional Review,	3	2017	3	2017
NP2 PERS MOD Preliminary Design Review	4	2017	1	2018
NP2 PERS MOD Critical Design Review	2	2018	2	2018
NP2 PERS MOD Application Test Readiness Review	3	2018	3	2018
NP2 PERS MOD PRR	4	2018	4	2018
NP2 PeopleSoft License Renewal FY18	1	2018	1	2018
NP2 PeopleSoft License Renewal FY19	1	2019	1	2019
NP2 PeopleSoft License Renewal FY20	1	2020	1	2020
NP2 PeopleSoft License Renewal FY21	1	2021	1	2021
PAY MOD Increment 1 Preliminary Design Review	2	2018	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PAY MOD Increment 1 Development	2	2018	3	2019
PAY MOD Continue Execution of Field Test 2 Sprint X	4	2018	2	2020
PAY MOD Incremental deployment of Field Test 2 Functionality into IPPS-N baseline	3	2019	4	2019
PAY MOD Deployment to IPPS-N baseline	2	2020	2	2020
PAY MOD Pers Driving Pay capability removed from NP2 baseline	2	2020	2	2020
PAY MOD Capability Set 2 deployed to IPPS-N baseline	2	2021	2	2021
PAY MOD Capability Set 2 removed from NP2 baseline	2	2021	2	2021
PAY MOD Capability Set 3 deployed to IPPS-N baseline	2	2022	2	2022
PAY MOD Capability Set 3 removed from NP2 baseline	2	2022	2	2022
PAY MOD 55 to X functionality set 1 deployed to IPPS-N baseline	4	2020	4	2020
PAY MOD 55 to X functionality set 2 deployed to IPPS-N baseline	4	2021	4	2021
PAY MOD 55 to X functionality set 3 deployed to IPPS-N baseline	4	2022	4	2022
AC/RC PERMEABILITY SOLUTION - Requirements Complete	1	2017	3	2017
AC/RC PERMEABILITY SOLUTION - RFQ Package	3	2017	4	2017
AC/RC PERMEABILITY SOLUTION - Task Order Award	1	2018	1	2018
PH1 AC/RC PERMEABILITY SOLUTION - Systems Requirements Review	2	2018	2	2018
PH1 AC/RC PERMEABILITY SOLUTION - Design	2	2018	3	2018
PH1 AC/RC PERMEABILITY SOLUTION - Preliminary Design Review	3	2018	3	2018
PH1 AC/RC PERMEABILITY SOLUTION - Critical Design Review Iteration One	1	2019	1	2019
PH1 AC/RC PERMEABILITY SOLUTION - Application Test Readiness Review Phase One	2	2019	2	2019
PH1 AC/RC PERMEABILITY SOLUTION - Application Functional Testing /System Int. Testing	2	2019	2	2019
PH1 AC/RC PERMEABILITY SOLUTION - Full Deployment Phase	3	2019	3	2019
PH2 AC/RC PERMEABILITY SOLUTION - Critical Design Review Phase Two	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PH2 AC/RC PERMEABILITY SOLUTION - Application Test Readiness Review Phase Two	4	2019	4	2019
PH2 AC/RC PERMEABILITY SOLUTION - Application Functional Testing /System Int. Testing Nov 19	1	2020	1	2020
PH2 AC/RC PERMEABILITY SOLUTION - Full Deployment Phase Two Jan 20	2	2020	2	2020
PH3 AC/RC PERMEABILITY SOLUTION - Critical Design Review Phase Three April 20	3	2020	3	2020
PH3 AC/RC PERMEABILITY SOLUTION - Application Test Readiness Review Phase Three Jul 20	4	2020	4	2020
PH3 AC/RC PERMEABILITY SOLUTION - Application Functional Testing /System Int. Testing Sep 20	4	2020	4	2020
PH3 AC/RC PERMEABILITY SOLUTION - Full Deployment Phase Three Nov 20	1	2021	1	2021
PH4 AC/RC PERMEABILITY SOLUTION - Critical Design Review Phase Four Jan 21	2	2021	2	2021
PH4 AC/RC PERMEABILITY SOLUTION - Application Test Readiness Review Phase Four Apr 21	3	2021	3	2021
PH4 AC/RC PERMEABILITY SOLUTION - Application Functional Testing /System Int. Testing Jul 21	4	2021	4	2021
PH4 AC/RC PERMEABILITY SOLUTION - Full Deployment Phase Three Sept 21	4	2021	4	2021
Risk Management Information (RMI)				
RMI Safety Program Management Award	1	2017	1	2017
RMI Safety Program Management Design	2	2017	2	2017
RMI Safety Program Management System Requirements Review	4	2017	4	2017
RMI Safety Program Management Preliminary Design Review	3	2017	3	2017
RMI Safety Program Management Critical Design Review	4	2017	4	2017
RMI Safety Program Management Acceptance Test Readiness Review	2	2018	2	2018
RMI Safety Program Management Test Readiness Review	4	2018	4	2018
RMI Safety Program Management Post Implementation Review	4	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RMI Safety Program Management Full Deployment	4	2018	1	2019
RMI Analysis and Dissemination Phase I Test Readiness Review	1	2017	1	2017
RMI Analysis and Dissemination Phase I Acceptance Post Implementation Review	2	2017	2	2017
RMI Analysis and Dissemination Phase I Full Deployment	2	2017	1	2018
RMI Analysis and Dissemination Phase II Award	1	2017	1	2017
RMI Analysis and Dissemination Phase II Design	1	2017	1	2017
RMI Analysis and Dissemination Phase II Preliminary Design Review	2	2017	2	2017
RMI Analysis and Dissemination Phase II Critical Design Review	4	2017	1	2018
RMI Analysis and Dissemination Phase II Acceptance Test Readiness Review	1	2018	1	2018
RMI Analysis and Dissemination Phase II Test Readiness Review	3	2018	3	2018
RMI Analysis and Dissemination Phase II Acceptance Post Implementation Review	4	2018	4	2018
RMI Analysis and Dissemination Phase II Full Deployment	4	2018	2	2019
RMI Analysis and Dissemintation Phase 3 - Predictive Analytics	2	2019	4	2019
RMI Streamlined Incident Reporting 2.0	2	2018	2	2019
RMI Streamlined Incident Reporting 3.0	2	2019	2	2020
Authoritative Data Environment (ADE)				
ADE Phase 1 Data Marts BI / Visualization / Analytics Products Contract Award	3	2017	3	2017
ADE Phase 1 Data Marts System Integrator Task Order Award	3	2017	3	2017
ADE Phase 1 Data Marts System Requirement Review / System Functional Review	3	2017	3	2017
ADE Phase 1 Data Marts Preliminary Design Review / Critical Design Review	3	2017	3	2017
ADE Phase 1 Data Marts Application Test Readiness Review / Production Readiness Review	3	2017	4	2017
ADE Phase 1 Data Marts Deployment	4	2017	1	2018
ADE Phase 2 Enterprise ADE Baseline SRR/SFR	1	2018	1	2018
ADE Phase 2 Enterprise ADE Baseline PDR	2	2018	2	2018
ADE Phase 2 Enterprise ADE Baseline CDR	2	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADE Phase 2 Enterprise ADE Baseline PRR	3	2018	3	2018
ADE Phase 2 Enterprise ADE Baseline IOC	3	2018	3	2018
ADE Phase 3 Enterprise ADE Functional Laboratory Build	1	2019	3	2019
ADE Phase 3 Enterprise ADE Infrastructure in Cloud Build	1	2019	3	2019
ADE Phase 4 NTMPS consolidation to ADE migration to cloud	1	2019	2	2019
ADE Phase 4 NPDB consolidation to ADE in cloud	1	2019	2	2021
ADE Phase 4 NMPBS consolidation to ADE in cloud	3	2019	4	2021
ADE Phase 4 NRDW consolidation to ADE in cloud	1	2020	2	2020
ADE Phase 4 C-WAY consolidation to ADE in cloud	3	2020	4	2020
ADE Phase 4 PRIDE-MOD consolidation to ADE in cloud	3	2020	4	2020
ADE Phase 4 CeTARS consolidation to ADE in cloud	1	2021	2	2021
ADE Phase 4 NSIPS Analytics consolidation to ADE in cloud	3	2021	4	2021
ADE Phase 4 NSIPS Analytics consolidation to ADE in cloud (FOC)	1	2022	2	2022
Applicant Relationship Management (ARM)				
ARM Phase 1 Post Award Conference	2	2017	2	2017
ARM Phase 1 Systems Requirements Review	2	2017	2	2017
ARM Phase 1 Requirements Review	2	2017	2	2017
ARM Phase 1 Initial Planning	2	2017	3	2017
ARM Phase 1 Design / Preliminary Design Revew	3	2017	3	2017
ARM Phase 1 Development # 1	3	2017	4	2017
ARM Phase 1 Code Release	4	2017	4	2017
ARM Phase 2 Development # 2	3	2017	1	2018
ARM Phase 2 Incremental Test # 2	1	2018	1	2018
ARM Phase 2 Code Release # 2	1	2018	1	2018
ARM Phase 2 Development # 3	1	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 2905 / *BUPERS IT*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ARM Phase 2 Critical Design Review	1	2018	1	2018
ARM Phase 2 Incremental Test # 3	3	2018	3	2018
ARM Phase 2 Code Release # 3	3	2018	3	2018
ARM Phase 2 Development # 4	3	2018	3	2019
Navy Manpower Requirements System (NMRS)				
NMRS Contract Award / Project Kick-Off	3	2017	3	2017
NMRS Requirements Analysis	3	2017	3	2017
NMRS Preliminary Design Review	3	2017	3	2017
NMRS Development	1	2018	4	2018
NMRS Critical Design Review	3	2018	4	2018
NMRS Incremental Acceptance Testing	4	2018	1	2019
NMRS Upgrade and Conduct Operation Test NEDC environments	2	2019	4	2019
NMRS Standup Testing of DISA CDS	3	2019	4	2019
NMRS Data Load, Validation, and Verification	4	2019	4	2019
NMRS Design, Development and Testing of Interfaces and Reports	4	2019	3	2020
NMRS Initiate Logistics and Training Strategy	4	2019	4	2020
NMRS Conduct Test Readiness Review	1	2020	1	2020
NMRS Conduct Final Product Code Completion UAT	1	2020	1	2020
NMRS IOC Deployment Release 1	2	2020	2	2020
NMRS IOC Deployment Release 2	3	2020	3	2020
NMRS FOC Deployment	4	2020	4	2020
NRIS - Improved accessions Talent Matching: Recruiting information System Start/ complete modification of PRIDE MOD II and ARM interface with Career Waypoint.	4	2018	4	2018
NRIS - Improved accessions Talent Matching: Complete	4	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 3167 / *Joint Technical Data Integration (JTDI)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3167: *Joint Technical Data Integration (JTDI)*	30.215	5.327	2.533	3.883	-	3.883	4.944	4.288	4.036	4.117	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Joint Technical Data Integration (JTDI) Program - JTDI funding supports the evaluation, testing and integration to develop a JTDI Commercial Off-The-Shelf (COTS) solution for installation on Carrier and Amphibious Assault class ships and up to 104 Navy/Marine Corp aviation activities. JTDI is a digital technical data access, delivery and local Organizational & Intermediate level library management toolset and telemaintenance collaboration process enabler. It improves accuracy and timeliness of technical manual and other technical data delivery and minimizes the Fleet's library management burden. JTDI reduces maintenance work hours with a savings Return on Investment of 2.5:1. It facilitates the transition of the Joint Distance Support and Response Advanced Concept Technology Demonstration for telemaintenance and provides for process efficiencies to support ongoing Aviation Fleet Technical Representative reductions.

Marine Aviation Logistics Enterprise Information Technology (MAL-EIT) - MAL-EIT funding supports the evaluation, development, testing and integration of software and hardware solutions across all US Marine Corps Aviation activities to be used in the planning and execution of geographically distributed, expeditionary Aviation Logistics (AVLOG) chains in support of deployed USMC Air Combat Element operations. The MAL-EIT Program is one of four programs contained within the Marine Aviation Logistics Support Program (MALSP) modernization program known as MALSP II. Legacy MALSP is nearly 25 years old and grossly inadequate in IT capability to meet the informational, planning, and C2 needs of a dynamic, geographically distributed nodal AVLOG system. MAL-EIT is a Defense Business System Abbreviated Acquisition Program that will develop and deliver the required IT capability necessary to eliminate the IT related gaps existing in the legacy MALSP. MAL-EIT is a family of IT solutions to be developed and delivered in three increments. These increments are depicted below:

Expeditionary Pack Up Kit (EPUK): Provides Expeditionary Supply Operations to include business administration, inventory, and customer service operations.

Next Generation Buffer Management System: Provides buffer management in a time domain, and buffer sizing analysis.

Logistics Planning Tool and Optimizer Tool: Provides capability to develop tailored Remote Expeditionary Support Packages, consumption forecasts, and Nodal Logistics Lay down designs.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Joint Technical Data Integration (JTDI)	1.298	0.952	1.413	0.000	1.413
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct development efforts associated with a major release of fully deployed COTS intensive JTDI system. Conduct COTS requirements definition, evaluation, integration, and testing of annual baseline releases. Conduct technology insertion of the JTDI system. ***FY 2019 Base Plans:*** Conduct development and redeployment efforts associated with a major release of fully deployed GOTS intensive JTDI system Version 2.0.6.5. Conduct COTS requirements definition, evaluation, integration, and testing of annual baseline releases. Perform development and testing in support of integration and consolidation of the Next Generation - Technical Manual Management Program (NG-TMMP) with the JTDI Program. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** JTDI increase in is due to the development of JTDI Data Transport Battlegroup Survivability Enhancements ensuring Tech Data is available for fleet users in degraded mode networks or during complete loss of access to land-based top tier servers commencing in FY18 and completing in FY20. It will be used to develop the JTDI Standard Data Repository providing a Big Data Storage and access solution enabling an advanced Enterprise Common CBM+ data analysis solution. This development will begin in Fy18 and is scheduled for Production in FY20.					
Title: Marine Aviation Logistics Enterprise Information Technology (MAL-EIT)	4.029	1.581	2.470	0.000	2.470
Articles:	-	-	-	-	-
FY 2018 Plans: Complete software development and test and evaluation of Logistics Planning Tool/MAL-EIT 3.0 solution for deployment to the fleet in FY19. ***FY 2019 Base Plans:*** Accelerate and complete fielding and deployment of Logistics Planning Tool/MAL-EIT 3.0 to meet Full Operation Capability in FY19 and begin software development of Logistics Planning Tool/MAL-EIT 3.1 ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
MAL-EIT FY19 increase for Wyle support is to accelerate the deployment of MAL-EIT 3.0 to meet the new deadline of FOC in FY19 as well as begin development of MAL-EIT 3.1.					
Accomplishments/Planned Programs Subtotals	5.327	2.533	3.883	0.000	3.883

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/4268/JTDI: *Joint Technical Data Integration (JTDI) Other Aviation Support Equipment*	0.784	2.134	2.340	-	2.340	2.365	2.408	2.453	2.502	Continuing	Continuing
• OPN/4268/MALSP II: *Marine Aviation Logistics Support Program (MALSP II) Aviation Support*	0.673	0.200	0.219	-	0.219	0.138	0.136	0.134	0.144	Continuing	Continuing

Remarks

D. Acquisition Strategy

Joint Technical Data Integration (JTDI) Program - The management approach includes the Program Management Office residing in NAVAIR with Milestone Decision Authority delegated to the NAVAIR Command Information Officer (CIO). The evolutionary development approach will be used to execute requirements. Contracting for the prime integrator will be via competitively awarded indefinite delivery - indefinite quantity contracts.

Marine Aviation Logistics Enterprise Information Technology (MAL-EIT) Program - The management approach includes the Program Management Office residing within NAVAIR 6.0 and Milestone Decision Authority delegated to NAVAIR 6.7. The evolutionary development approach will be used to execute requirements. Contracting for the prime integrator will be via competitively awarded cost plus fixed fee contracts.

E. Performance Metrics

Joint Technical Data Integration (JTDI) and Marine Aviation Logistics Enterprise Information Technology (MAL-EIT)- Successfully achieve government testing of annual software release.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 3167 / *Joint Technical Data Integration (JTDI)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development for Joint Technical Data Integration (JTDI)	C/FFP	ARANEA : Huntsville, AL	7.688	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development for JTDI	MIPR	DTIC : Fort Belvior, VA	1.190	1.299	Jan 2017	0.461	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Software Development/ Hardware Integration for Marine Aviation Logistics Enterprise Information Technology (MAL-EIT)	C/CPFF	Wyle : Patuxent River, MD	3.882	2.055	Feb 2017	0.334	Jan 2018	1.180	Jan 2019	-		1.180	Continuing	Continuing	Continuing
Software Development/ Hardware Integration for MAL-EIT	C/T&M	Applied Research : Penn State	1.015	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior year support no longer funded in the FYDP	Various	Various : Various	7.638	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development/ Hardware Integration MAL-EIT	WR	NAWCAD : Patuxent River, MD	0.682	0.471	Nov 2016	0.531	Nov 2017	0.395	Nov 2018	-		0.395	Continuing	Continuing	Continuing
Software Development/ Hardware Integration MAL-EIT	WR	NEDC : New Orleans, LA	0.261	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development/Software Integration - MAL-EIT	WR	NAWCWD : China Lake	0.700	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development/Software Integration - MAL-EIT	WR	NEDC : Patuxent River, MD	0.000	0.045	Dec 2016	0.160	Oct 2017	0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
Software Development for JTDI	C/CPFF	Control Point Corporation : Patuxent River, MD	0.000	0.000		0.000		0.550	Apr 2019	-		0.550	Continuing	Continuing	Continuing
		Subtotal	23.056	3.870		1.486		2.225		-		2.225	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation for MAL-EIT	WR	SPAWAR : Norfolk, VA	1.629	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation for MAL-EIT	C/CPFF	Wyle : Patuxent River, MD	0.413	0.473	Feb 2017	0.077	Jan 2018	0.272	Jan 2019	-		0.272	Continuing	Continuing	Continuing
Prior year Test & Eval no longer funded in the FYDP	Various	Various : Various	0.909	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation, MAL-EIT	WR	NAWCAD : Patuxent River, MD	0.333	0.146	Nov 2016	0.133	Nov 2017	0.076	Nov 2018	-		0.076	Continuing	Continuing	Continuing
Developmental Test & Evaluation, MAL-EIT	WR	NSWC : Corona, CA	0.000	0.025	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Developmental Test & Evaluation JDTI	C/CPFF	Control Point Corporation : Patuxent River, MD	0.000	0.000		0.000		0.500	Jan 2019	-		0.500	Continuing	Continuing	Continuing
		Subtotal	3.284	0.644		0.210		0.848		-		0.848	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support for Marine Aviation Logistics Enterprise Information Technology (MAL-EIT)	WR	SPAWAR : Norfolk, VA	0.832	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support MAL-EIT	WR	NAWCAD : Patuxent River, MD	0.216	0.108	Nov 2016	0.212	Nov 2017	0.072	Nov 2018	-		0.072	Continuing	Continuing	Continuing
Program Management Support MAL-EIT	C/CPFF	Wyle : Patuxent River, MD	0.410	0.630	Feb 2017	0.103	Jan 2018	0.345	Jan 2019	-		0.345	Continuing	Continuing	Continuing
Prior year Mgmt Svcs Cost no longer funded in the FYDP	Various	Various : Various	0.473	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*

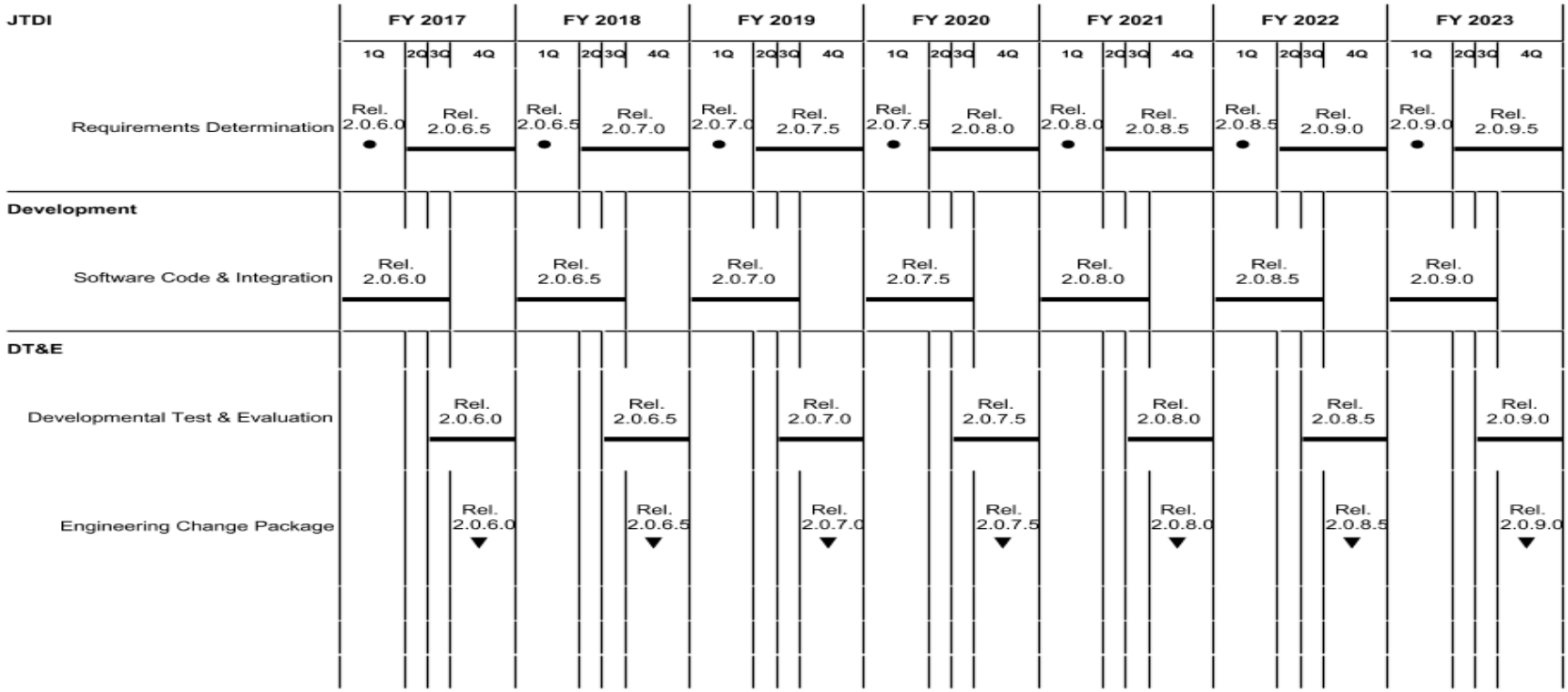
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support - Joint Technical Data Integration	WR	NAWCAD : Patuxent River, MD	1.894	0.000		0.492	Nov 2017	0.363	Nov 2018	-		0.363	Continuing	Continuing	Continuing
Program Management Support - TRAVEL - MAL-EIT	WR	NAVAIR HQ : Patuxent River, MD	0.050	0.056	Oct 2016	0.030	Oct 2017	0.030	Oct 2018	-		0.030	Continuing	Continuing	Continuing
Program Management Support MAL-EIT	WR	W4MK Armament RDEC : Pacatiny Arsenal, NJ	0.000	0.019	Jun 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	3.875	0.813		0.837		0.810		-		0.810	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	30.215	5.327		2.533		3.883		-		3.883	Continuing	Continuing	N/A

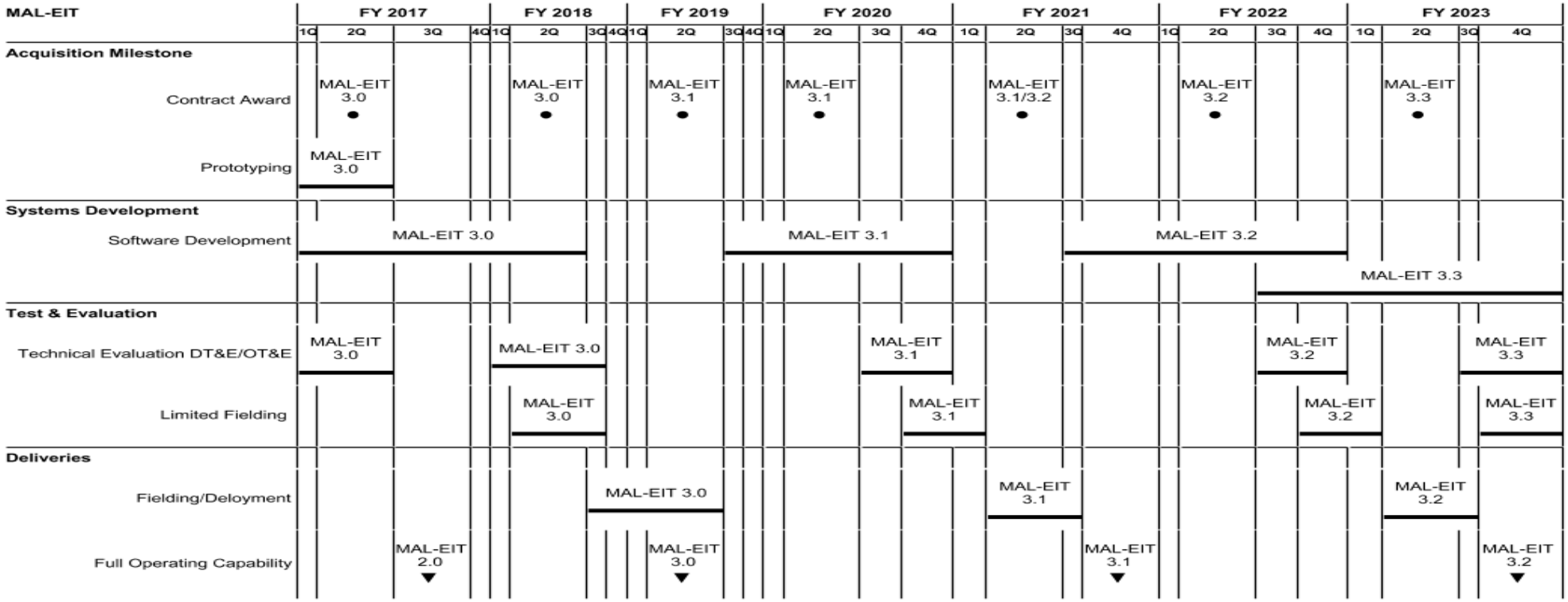
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*



2019OSD - 0605013N - 3167

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*



2019OSD - 0605013N - 3167

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JTDI				
Requirements Determination: Release 2.0.6.5	2	2017	4	2017
Requirements Determination: Release 2.0.7.0	2	2018	4	2018
Requirements Determination: Release 2.0.7.5	2	2019	4	2019
Requirements Determination: Release 2.0.8.0	2	2020	4	2020
Requirements Determination: Release 2.0.8.5	2	2021	4	2021
Requirements Determination: Release 2.0.9.0	2	2022	4	2022
Requirements Determination: Release 2.0.9.5	2	2023	4	2023
Requirements Determination: Contract Award, Release 2.0.6.0	1	2017	1	2017
Requirements Determination: Contract Award, Release 2.0.6.5	1	2018	1	2018
Requirements Determination: Contract Award, Release 2.0.7.0	1	2019	1	2019
Requirements Determination: Contract Award, Release 2.0.7.5	1	2020	1	2020
Requirements Determination: Contract Aware, Release 2.0.8.0	1	2021	1	2021
Requirements Determination: Contract Aware, Release 2.0.8.5	1	2022	1	2022
Requirements Determination: Contract Aware, Release 2.0.9.0	1	2023	1	2023
Development: Software Code & Integration: Release 2.0.6.0	1	2017	3	2017
Development: Software Code & Integration: Release 2.0.6.5	1	2018	3	2018
Development: Software Code & Integration: Release 2.0.7.0	1	2019	3	2019
Development: Software Code & Integration: Release 2.0.7.5	1	2020	3	2020
Development: Software Code & Integration: Release 2.0.8.0	1	2021	3	2021
Development: Software Code & Integration: Release 2.0.8.5	1	2022	3	2022
Development: Software Code & Integration: Release 2.0.9.0	1	2023	3	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DT&E: Developmental Test & Evaluation: Release 2.0.6.0	3	2017	4	2017
DT&E: Developmental Test & Evaluation: Release 2.0.6.5	3	2018	4	2018
DT&E: Developmental Test & Evaluation: Release 2.0.7.0	3	2019	4	2019
DT&E: Developmental Test & Evaluation: Release 2.0.7.5	3	2020	4	2020
DT&E: Developmental Test & Evaluation: Release 2.0.8.0	3	2021	4	2021
DT&E: Developmental Test & Evaluation: Release 2.0.8.5	3	2022	4	2022
DT&E: Developmental Test & Evaluation: Release 2.0.9.0	3	2023	4	2023
DT&E: Engineering Change Package: Release 2.0.6.0	4	2017	4	2017
DT&E: Engineering Change Package: Release 2.0.6.5	4	2018	4	2018
DT&E: Engineering Change Package: Release 2.0.7.0	4	2019	4	2019
DT&E: Engineering Change Package: Release 2.0.7.5	4	2020	4	2020
DT&E: Engineering Change Package: Release 2.0.8.0	4	2021	4	2021
DT&E: Engineering Change Package: Release 2.0.8.5	4	2022	4	2022
DT&E: Engineering Change Package: Release 2.0.9.0	4	2023	4	2023
MAL-EIT				
Acquisition Milestone: Contract Award: Contract Award (5)	2	2017	2	2017
Acquisition Milestone: Contract Award: Contract Award (6)	2	2018	2	2018
Acquisition Milestone: Contract Award: Contract Award (7)	2	2019	2	2019
Acquisition Milestone: Contract Award: Contract Award (8)	2	2020	2	2020
Acquisition Milestone: Contract Award: Contract Award (9)	2	2021	2	2021
Acquisition Milestone: Contract Award: Contract Award (10)	2	2022	2	2022
Acquisition Milestone: Contract Award: Contract Award (11)	2	2023	2	2023
Acquisition Milestone: Prototyping: Prototyping (3)	1	2017	2	2017
Systems Development: Software Development: Software Development (3)	1	2017	2	2018
Systems Development: Software Development: Software Development (4)	3	2019	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3167 / *Joint Technical Data Integration (JTDI)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Software Development: Software Development (5)	3	2021	4	2022
Systems Development: Software Development: Software Development (6)	3	2022	4	2023
Test & Evaluation: Technical Evaluation DT&E/OT&E: Technical Evaluation DT&E (3)	1	2017	2	2017
Test & Evaluation: Technical Evaluation DT&E/OT&E: Technical Evaluation DT&E/ OT&E (4)	1	2018	3	2018
Test & Evaluation: Technical Evaluation DT&E/OT&E: Technical Evaluation DT&E/ OT&E (5)	3	2020	4	2020
Test & Evaluation: Technical Evaluation DT&E/OT&E: Technical Evaluation DT&E/ OT&E (6)	3	2022	4	2022
Test & Evaluation: Technical Evaluation DT&E/OT&E: Technical Evaluation DT&E/ OT&E (7)	3	2023	4	2023
Test & Evaluation: Limited Fielding: Limited Fielding (3)	2	2018	3	2018
Test & Evaluation: Limited Fielding: Limited Fielding (4)	4	2020	1	2021
Test & Evaluation: Limited Fielding: Limited Fielding (5)	4	2022	1	2023
Test & Evaluation: Limited Fielding: Limited Fielding (6)	4	2023	4	2023
Deliveries: Fielding/Deloyment: Fielding/Deployment (2)	3	2018	2	2019
Deliveries: Fielding/Deloyment: Fielding/Deployment (3)	2	2021	3	2021
Deliveries: Fielding/Deloyment: Fielding/Deployment (4)	2	2023	3	2023
Deliveries: Full Operating Capability: Full Operating Capability (3)	2	2019	2	2019
Deliveries: Full Operating Capability: Full Operating Capability (2)	3	2017	3	2017
Deliveries: Full Operating Capability: Full Operating Capability (4)	4	2021	4	2021
Deliveries: Full Operating Capability: Full Operating Capability (5)	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 3185 / *Joint Airlift Information System (JALIS)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3185: *Joint Airlift Information System (JALIS)*	1.698	0.316	0.348	0.353	-	0.353	0.349	0.356	0.364	0.372	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

JALIS is an operational scheduling and aircraft management system that facilitates real-time data analysis. JALIS is a critical element in the management of DoD air logistics assets. JALIS allows:

(1) DoD Service Personnel to submit airlift requirements for DoD Personnel and cargo
(2) Air Logistics Flying Units to communicate their aircraft availability in a real-time graphic display
(3) Designated Scheduling Organizations to compare airlift requirements with available aircraft
(4) Designated Scheduling Organizations to create mission assignments

JALIS informs applicable users of mission details and modifications by using a combination of system displays and email updates. JALIS is geographically distributed and has a user base in excess of 4,000 members. JALIS facilitates the movement of thousands of DoD Personnel and tons of cargo annually in support of the following:

(1) Navy Unique Fleet Essential Airlift
(2) Army's Operational Support Airlift Agency (OSAA)
(3) United States Transportation Command (USTRANSCOM)
(4) United States Marine Corps (USMC)

The Joint Chiefs of Staff mandates JALIS as the official DoD Airlift scheduling system for Operational Support Airlift (OSA). JALIS meets the requirement for multi-service coordinated Air Logistics scheduling as directed by Chairman, Joint Chiefs of Staff. The Navy is designated as lead agency for sponsoring and funding the JALIS program.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Joint Air Logistic Information System (JALIS)	0.316	0.348	0.353	0.000	0.353
Articles:	-	-	-	-	-
FY 2018 Plans:					
1. Provide changes and enhancements as directed by the JALIS configuration control board					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
2. Integrate user functions between JALIS and JALIS Dashboard ***FY 2019 Base Plans:*** 1. Create capability to archive historical flight and airlift request records, to include full querying and reporting functions. 2. Create new query and analysis tools to automatically identify solutions for consolidating airlift requests and scheduled flights 3. Begin design and developments of new user interface displays that will consolidate functions currently distributed throughout the system ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 increase due to increased support required for new user interface displays.					
Accomplishments/Planned Programs Subtotals	0.316	0.348	0.353	0.000	0.353

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

As a general rule, IT development programs use an agile software development methodology therefore milestones, tasks and phases are often conducted in parallel vice sequentially.

Contract activities will focus on developing the following capabilities:

(1) Improved functionality for flight scheduling
(2) Improved coordination between JALIS scheduling organizations
(3) Integration of JALIS and JALIS Dashboard functions

E. Performance Metrics

Performance metrics for JALIS include:

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

(1) Completion of system change request requirements enabling production of articles as itemized in Section B.
(2) Increase operational efficiency
(a) Reduce time to train scheduling personnel by 15%
(b) Reduce time to search for scheduling solutions 10%
(c) Reduce time to train new JALIS users by 20%

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development, Analysis and QA support	C/CPFF	Navy Air Logistics Office (AHA) : New Orleans, LA	1.698	0.316	Feb 2017	0.348	Feb 2018	0.353	Feb 2019	-		0.353	Continuing	Continuing	Continuing
		Subtotal	1.698	0.316		0.348		0.353		-		0.353	Continuing	Continuing	N/A

Remarks

Development efforts are focused on improving system querying and reporting performance, as well as automating and simplifying common user tasks.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.698	0.316		0.348		0.353		-		0.353	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

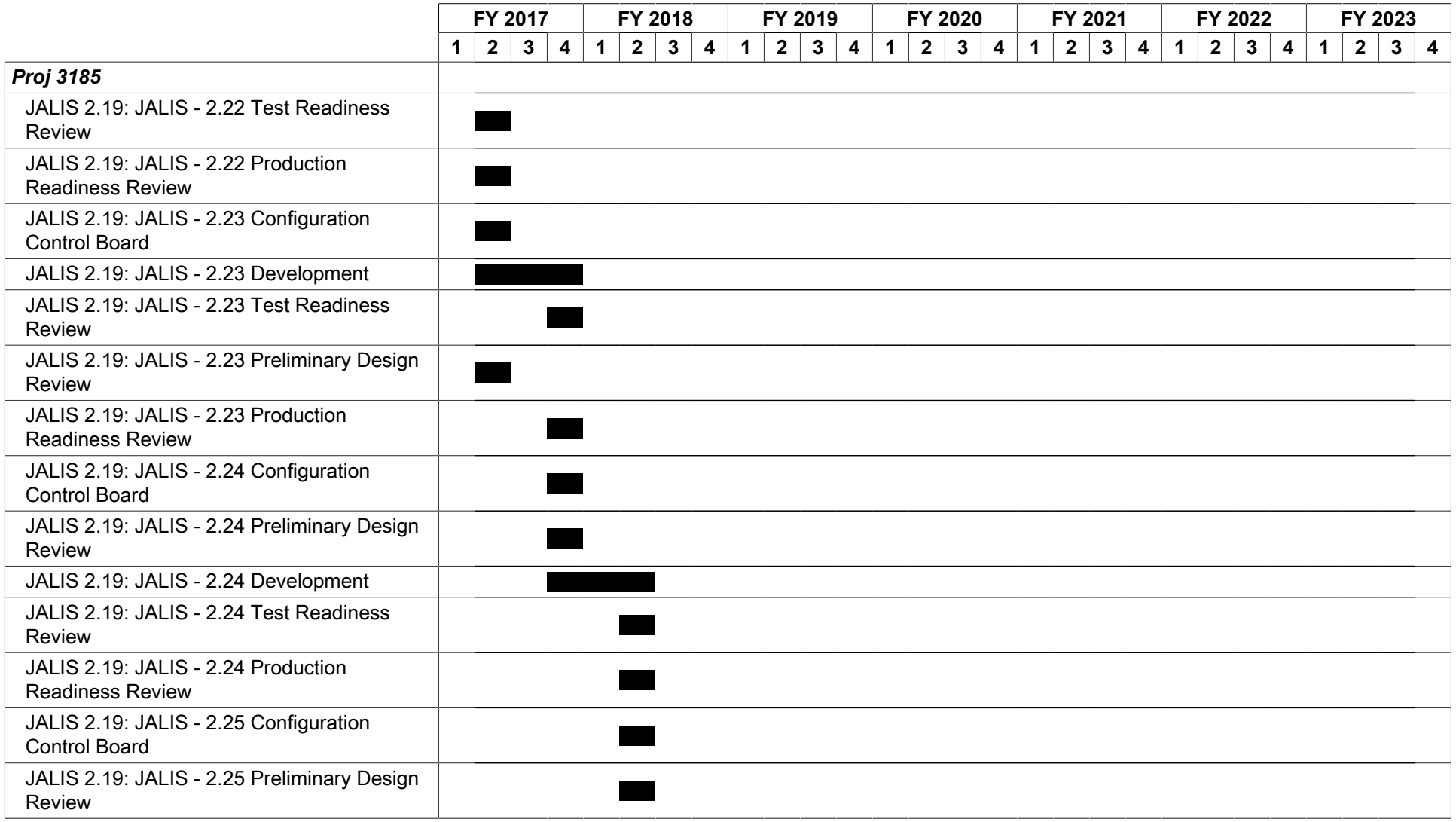


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

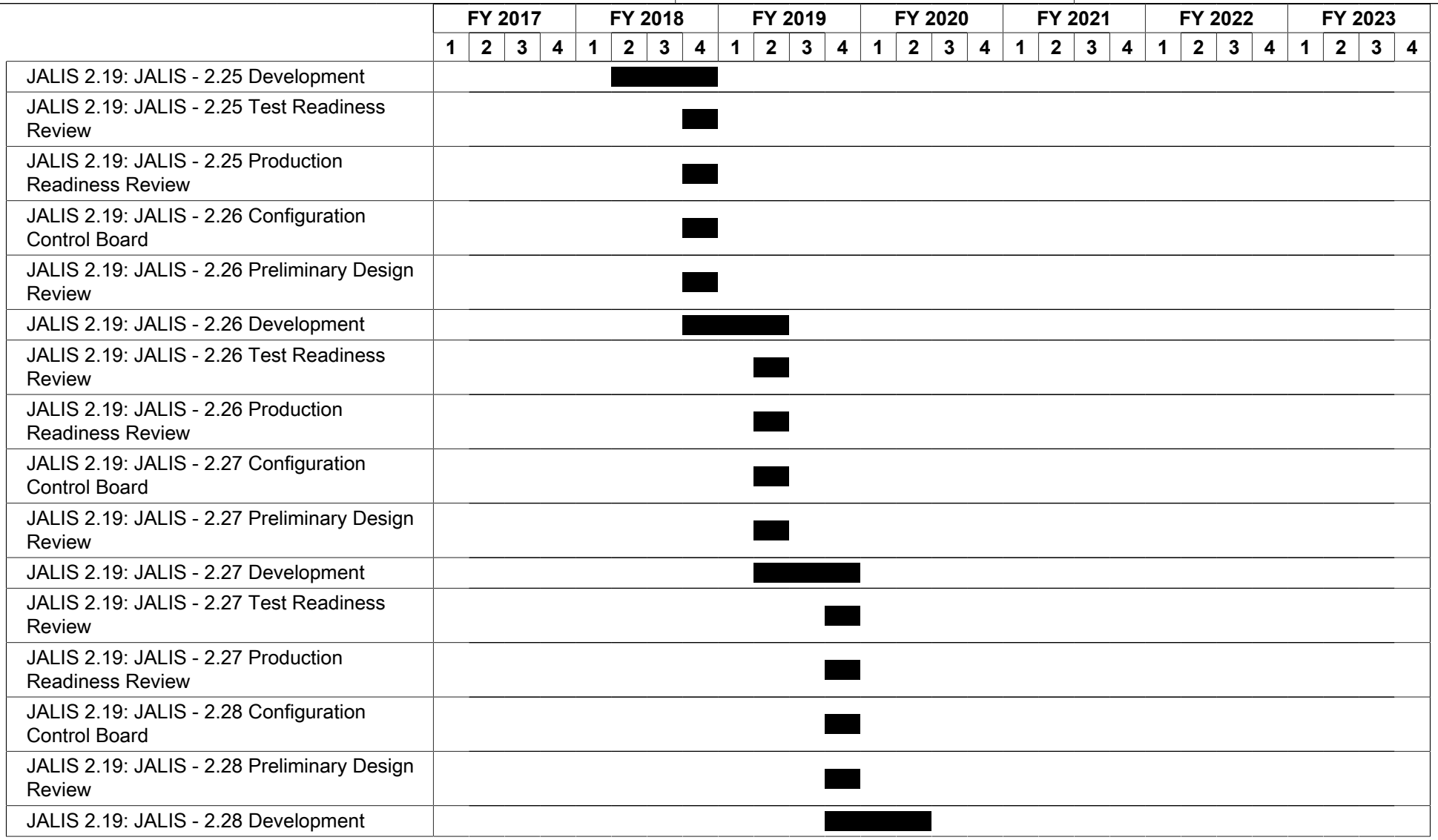


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

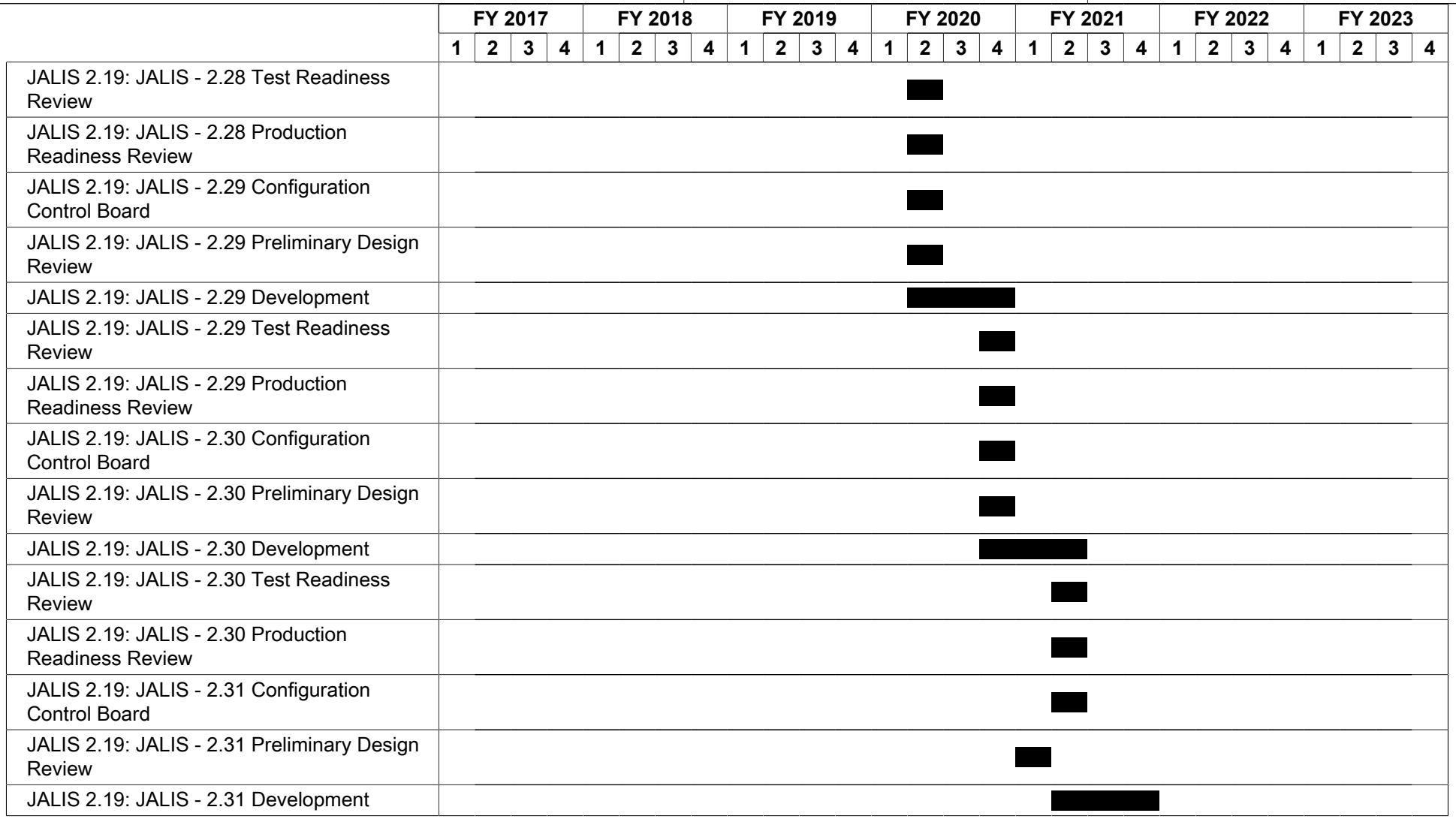


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

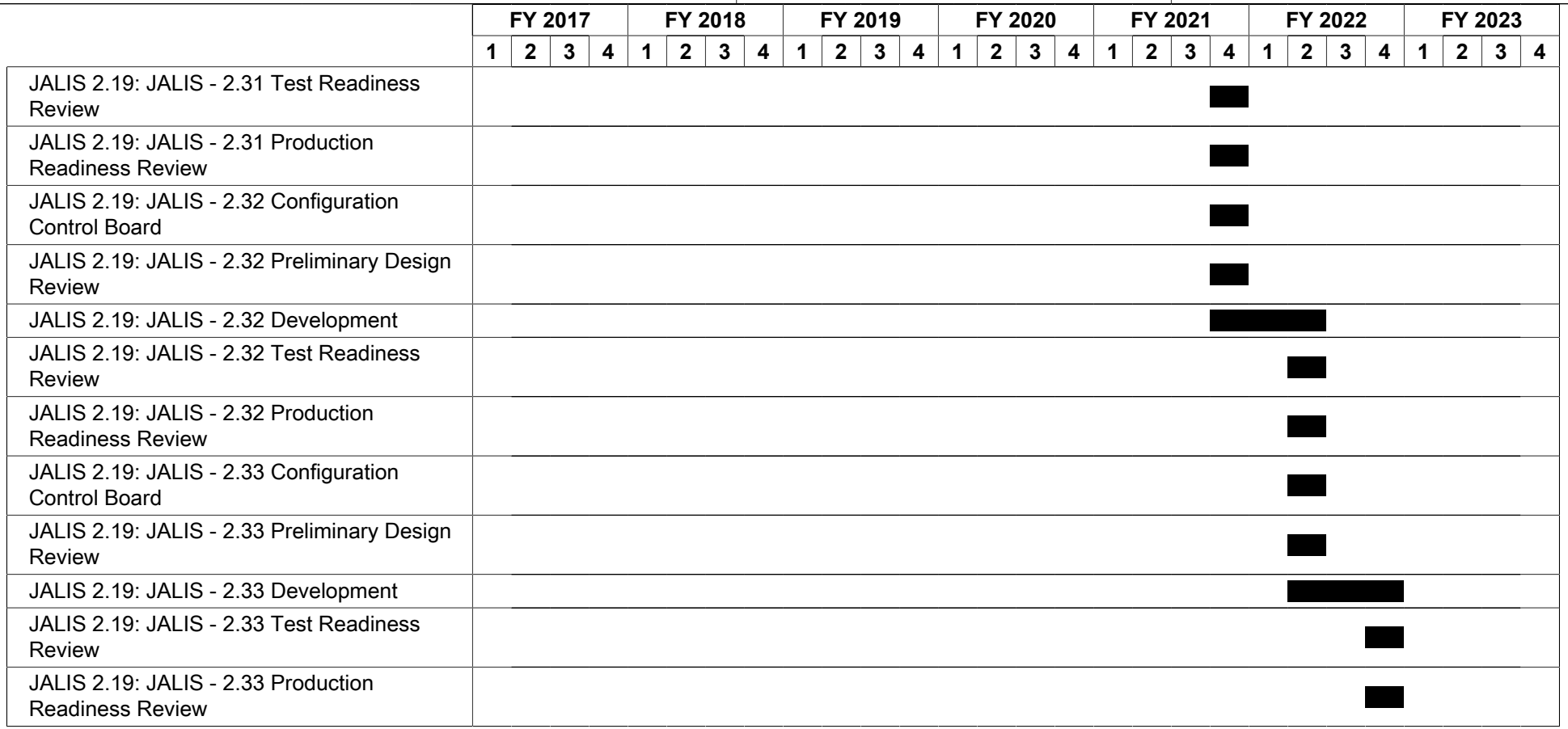


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3185				
JALIS 2.19: JALIS - 2.22 Test Readiness Review	2	2017	2	2017
JALIS 2.19: JALIS - 2.22 Production Readiness Review	2	2017	2	2017
JALIS 2.19: JALIS - 2.23 Configuration Control Board	2	2017	2	2017
JALIS 2.19: JALIS - 2.23 Development	2	2017	4	2017
JALIS 2.19: JALIS - 2.23 Test Readiness Review	4	2017	4	2017
JALIS 2.19: JALIS - 2.23 Preliminary Design Review	2	2017	2	2017
JALIS 2.19: JALIS - 2.23 Production Readiness Review	4	2017	4	2017
JALIS 2.19: JALIS - 2.24 Configuration Control Board	4	2017	4	2017
JALIS 2.19: JALIS - 2.24 Preliminary Design Review	4	2017	4	2017
JALIS 2.19: JALIS - 2.24 Development	4	2017	2	2018
JALIS 2.19: JALIS - 2.24 Test Readiness Review	2	2018	2	2018
JALIS 2.19: JALIS - 2.24 Production Readiness Review	2	2018	2	2018
JALIS 2.19: JALIS - 2.25 Configuration Control Board	2	2018	2	2018
JALIS 2.19: JALIS - 2.25 Preliminary Design Review	2	2018	2	2018
JALIS 2.19: JALIS - 2.25 Development	2	2018	4	2018
JALIS 2.19: JALIS - 2.25 Test Readiness Review	4	2018	4	2018
JALIS 2.19: JALIS - 2.25 Production Readiness Review	4	2018	4	2018
JALIS 2.19: JALIS - 2.26 Configuration Control Board	4	2018	4	2018
JALIS 2.19: JALIS - 2.26 Preliminary Design Review	4	2018	4	2018
JALIS 2.19: JALIS - 2.26 Development	4	2018	2	2019
JALIS 2.19: JALIS - 2.26 Test Readiness Review	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JALIS 2.19: JALIS - 2.26 Production Readiness Review	2	2019	2	2019
JALIS 2.19: JALIS - 2.27 Configuration Control Board	2	2019	2	2019
JALIS 2.19: JALIS - 2.27 Preliminary Design Review	2	2019	2	2019
JALIS 2.19: JALIS - 2.27 Development	2	2019	4	2019
JALIS 2.19: JALIS - 2.27 Test Readiness Review	4	2019	4	2019
JALIS 2.19: JALIS - 2.27 Production Readiness Review	4	2019	4	2019
JALIS 2.19: JALIS - 2.28 Configuration Control Board	4	2019	4	2019
JALIS 2.19: JALIS - 2.28 Preliminary Design Review	4	2019	4	2019
JALIS 2.19: JALIS - 2.28 Development	4	2019	2	2020
JALIS 2.19: JALIS - 2.28 Test Readiness Review	2	2020	2	2020
JALIS 2.19: JALIS - 2.28 Production Readiness Review	2	2020	2	2020
JALIS 2.19: JALIS - 2.29 Configuration Control Board	2	2020	2	2020
JALIS 2.19: JALIS - 2.29 Preliminary Design Review	2	2020	2	2020
JALIS 2.19: JALIS - 2.29 Development	2	2020	4	2020
JALIS 2.19: JALIS - 2.29 Test Readiness Review	4	2020	4	2020
JALIS 2.19: JALIS - 2.29 Production Readiness Review	4	2020	4	2020
JALIS 2.19: JALIS - 2.30 Configuration Control Board	4	2020	4	2020
JALIS 2.19: JALIS - 2.30 Preliminary Design Review	4	2020	4	2020
JALIS 2.19: JALIS - 2.30 Development	4	2020	2	2021
JALIS 2.19: JALIS - 2.30 Test Readiness Review	2	2021	2	2021
JALIS 2.19: JALIS - 2.30 Production Readiness Review	2	2021	2	2021
JALIS 2.19: JALIS - 2.31 Configuration Control Board	2	2021	2	2021
JALIS 2.19: JALIS - 2.31 Preliminary Design Review	1	2021	1	2021
JALIS 2.19: JALIS - 2.31 Development	2	2021	4	2021
JALIS 2.19: JALIS - 2.31 Test Readiness Review	4	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3185 / *Joint Airlift Information System (JALIS)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JALIS 2.19: JALIS - 2.31 Production Readiness Review	4	2021	4	2021
JALIS 2.19: JALIS - 2.32 Configuration Control Board	4	2021	4	2021
JALIS 2.19: JALIS - 2.32 Preliminary Design Review	4	2021	4	2021
JALIS 2.19: JALIS - 2.32 Development	4	2021	2	2022
JALIS 2.19: JALIS - 2.32 Test Readiness Review	2	2022	2	2022
JALIS 2.19: JALIS - 2.32 Production Readiness Review	2	2022	2	2022
JALIS 2.19: JALIS - 2.33 Configuration Control Board	2	2022	2	2022
JALIS 2.19: JALIS - 2.33 Preliminary Design Review	2	2022	2	2022
JALIS 2.19: JALIS - 2.33 Development	2	2022	4	2022
JALIS 2.19: JALIS - 2.33 Test Readiness Review	4	2022	4	2022
JALIS 2.19: JALIS - 2.33 Production Readiness Review	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 3432 / *NMMES-TR*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3432: *NMMES-TR*	0.000	0.000	0.000	44.999	-	44.999	81.579	64.681	58.923	40.561	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The NMMES Technical Refresh (NMMES-TR) program replaces current GOTS software with cloud-based COTS software. NMMES-TR is not a new start; it was formerly a project under Navy Maritime Maintenance Enterprise Solution (NMMES) and reported under Project 2904 of PE 0605013N prior to FY19. The NMMES and NMMES-TR projects complement each other to provide both sustainment of the existing systems and the initial system design, development, and migration to a cloud-based commercial solution. Both programs are essential to build the integrated environment so the existing applications can transition to the follow-on technical refresh replacement solution.

A. Mission Description and Budget Item Justification

The NMMES-TR is an Information Technology (IT) acquisition program that will provide a sustainable enterprise IT solution leveraging Commercial, Off-The-Shelf (COTS) technology and business processes for shore maritime maintenance. Unlike the uniquely custom designed status quo toolset, the NMMES-TR solution will not implement extensive product customization to match the current maintenance business processes; but rather, maintenance business processes will be modified to match the software solution, thereby adopting industry best practices. Accordingly, the solution will be more flexible to the BPR process, and more agile to capitalize on efficiency improvement opportunities and innovations. This will facilitate alignment with the Optimized Fleet Response Plan (OFRP) by assisting the maintenance activities with accomplishing assigned tasks as planned in order that submarines, aircraft carriers, and surface ships can properly train and deploy on schedule. NMMES-TR will also provide a modern solution that will be more effective and efficient in combating cybersecurity threats, and capable of continuous monitoring.

The NMMES-TR initiative has been a pre-acquisition Defense Business System (DBS) effort for the past three years funded Line Item 0605013N, Project Number 2904. In April 2017, the Department approved the NMMES-TR initiative to commence as an acquisition program, resulting in the establishment of a new Project Number 3432 beginning in FY19.

In FY18, the program will be working toward the award of a System Integrator contract. Major milestones in FY18 include Gates 3,4 &5 followed by an Acquisition Authority to Proceed to release the Request for Proposal.

The FY19 increase in funding reflects the scheduled award of the contract to provide a Cloud-based Capability Integration Platform (CIP) environment to integrate core NMMES financial management, human capital management, digital shipbuidling environment, and the cloud-based COTS solution that provides the Maintenance, Repair and Overhaul (MRO) and Portfolio and Project Management (PPM) functionality in support of the Shore Maritime Maintenance community mission. Additionally, the FY19 funding increase supports inherently Governmental efforts (i.e. contracting, acquisition planning & source selection, financial and business management, engineering, testing, logistics, etc.), and Contractor Support Services (i.e. systems engineering, organizational change management, logistics, deployment support, training, etc.). These activities support the award of the System Integrator contract planned for Q2 FY20 following a competitive source selection.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3432 / *NMMES-TR*

The NMMES-TR program office is staffed by government personnel from NAVSEA and SPAWAR SYSCOMS and their supporting Warfare/Systems Centers on a reimbursable basis. Based on a cross-SYSCOM Operating Agreement, the FY19 budget includes funding for inherently governmental efforts in the following functional areas:

a. SPAWAR HQ: Contracting, Legal, Engineering and Cybersecurity
b. SPAWAR Systems Center Atlantic: Engineering and Acquisition
c. NWSC Dahlgren Division: Program Cost Estimating and Analysis
d. Naval Sea Logistics Center (NSLC): Acquisition, Financial and Business Management, Testing and Logistics

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Systems Integration and MRO/PPM Solution	0.000	0.000	44.999	0.000	44.999
Articles:	-	-	-	-	-
FY 2018 Plans: Listed under Project 2904					
FY 2019 Base Plans: Continue the planning and preparation to support a full and open competition with the release of the RFP for a System Integrator contract award. The Systems Integrator will integrate existing legacy systems and application capabilities with COTS cloud-based applications to support Increment 1, the Maintenance, Repair, and Overhaul (MRO) and Portfolio and Project Management (PPM) functionality of the Shore Maritime Maintenance community mission. This effort to integrate legacy capabilities with COTS cloud-based applications includes the establishment and use of a Capability Integration Platform to provide for the transition from the NMMES solution to the NMMES-TR solution.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The increase from FY18 to FY19 reflects the increased support required for the establishment of the Capability Integration Platform (CIP), the cloud-based environment to analyze and integrate core NMMES financial management, human capital management, digital shipbuilding environment systems, applications, and data in support of the development of the NMMES-TR solution.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	44.999	0.000	44.999

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3432 / *NMMES-TR*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Based on the results of the Analysis of Alternatives completed in FY17, NMMES-TR will acquire cloud hosted COTS applications using an incremental approach based on the required functionality for the shore maritime maintenance community. This program will integrate the following Mission Tasks; Maintenance, Repair and Overhaul (MRO), Project and Portfolio Management, Supply Chain Management, Environmental Safety and Occupational Health (ESOH) and Data Analytics. The program will use a third-party Systems Integrator to integrate existing legacy systems with cloud hosted COTS applications that will be deployed to the Navy's Regional Maintenance Centers, public naval shipyards, ship repair facilities, and other maintenance activities. The incremental approach provides off ramps in the event that not all functionality can be delivered within the cost/schedule/performance constraints of the program.

E. Performance Metrics

SPM 1.0 OPERATIONAL AVAILABILITY:
Operational availability is defined as the percentage of time that NMMES-TR is operationally capable of performing an assigned mission. The operational availability SPM measures the degree to which a system can be supported both in terms of its inherent design characteristics of reliability, availability, maintainability, and operational effectiveness, and the efficacy of the various elements of product support, tools, and training. NMMES-TR will provide a supportable framework with a direct focus on COTS.

SPM 1.1 Reliability - Reliability represents the probability the system will operate without failure over a specified period of time. Reliability accounts for Unscheduled Maintenance.

Mission Critical Functions Threshold
99.5% at LD
99.9% at FD

Mission Critical Functions Objective
97.8% At LD
99.9% at FD

SPM 1.2 Availability - This represents the ability of an end user to access and use the service provided by the system. A Consumer Facing availability requirement is a promise to consumers that they will be able to use the service a certain percentage of time. Availability downtime includes both scheduled and unscheduled maintenance. NMMES-TR must be operationally available to support the maritime maintenance mission.

Mission Critical Functions Threshold
AO > 86.2% at LD

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3432 / *NMMES-TR*

AO > 96.6% at FD

Mission Critical Functions Objective
AO > 98.3% at LD
AO > 99.3% at FD

SPM 1.3 Maintainability - The system's ability to be retained in, or restored to, a specified condition when maintenance is performed by personnel with a specified skill, using prescribed procedures and resources, and at each prescribed level of maintenance and repair. Mean time to repair (MTTR) is a basic technical measure of maintainability. The service may be made unavailable for scheduled maintenance, as long as schedule maintenance intervals last no longer than four hours and occur no more frequently than once per month.

Mission Critical Functions Threshold
MTTR < or equal to 6 hrs at LD
MTTR < or equal to 2 hrs at FD

Mission Critical Functions Objective
MTTR < or equal to 4 hrs at LD
MTTR < or equal to 1 hrs at FD

SPM 2.0 SCALABILITY:
Scalability is defined as the capability of a system, network, or process to handle a growing amount of work or its potential to enlarge to accommodate growth. NMMES-TR must be able to support enterprise level usage above 51,000 users worldwide with 25,000 concurrent users. NMMES-TR will also provide scheduling, monitoring, and tracking (SMT) of an upwards of 300,000 individual tasks within a single project for a single site (public NSY or RMC). The dynamic usage solutions will also have the capacity to scale down based on user demand, reducing system resource demand when the high volume is not required. Elastic provisioning and service management targets real end users and mission needs for functionality as the services evolve over time.

SPM 2.1 Dynamic Users - NMMES-TR must be able to support enterprise level usage of at least 51,000 users NMMES-TR must be designed to support user growth.

User Accounts Threshold
> 10,000 at LD
> 51,000 at FD

User Accounts Objective
> 20,000 at LD
> 55,000 at FD

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3432 / *NMMES-TR*

SPM 2.2 Concurrent Users - NMMES-TR must support concurrent users without degradation in System Response Time.

Threshold: > 50% of total users
Objective: > 75% of total users

SPM 2.3 Resources/Project SMT Capacity - NMMES-TR must support scheduling and critical chain project management tracking of at least 300,000 individual tasks within a single project for a single site (public NSY or RMC). NMMES-TR must be capable of providing a 50% surge in the level of user accounts.

Project Tasks Threshold
> 75,000 Activity Tasks per Project at LD and > or equal to 100,000 Activity Tasks per Project at FD
> 150,000 Detail Level Tasks per Project at LD and > or equal to 400,000 Detail Level Tasks per Project at FD
> or equal to 75% Surge Capacity in Level of User Growth at LD and FD

Project Tasks Objective
> or equal to 100,000 Activity Tasks per Project at LD and FD
> or equal to 400,000 Detail level Tasks per Project at LD and FD
> or equal to 75% Surge capacity in Level of User Growth at LD and FD

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3432 / *NMMES-TR*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cloud Services	TBD	Not Specified : Not Specified	0.000	0.000		0.000		36.149	May 2019	-		36.149	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		36.149		-		36.149	Continuing	Continuing	N/A

Remarks

Growth in FY19 Product development supports activities include the configuration and integration of cloud hosted COTS applications with NMMES legacy systems migration to a cloud hosted environment. Specific tasks include the Capability Integration Platform, the Maintenance Repair and Overhaul (RMO) solution for the Regional Maintenance Centers (RMCs) and Naval Shipyards, Supply Chain Management, Data Analytics and Business Intelligence, Asset Management, ESOH, Laboratory Management, and the Technical Refresh of the MRO Work Brokering and Requirements Management system. Contract Award for the Cloud-based Capability Integration Platform (CIP) is planned for FY19.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Support	Various	PMS 444 : WNY	0.000	0.000		0.000		8.850	Nov 2018	-		8.850	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		8.850		-		8.850	Continuing	Continuing	N/A

Remarks

Program Management Office contractor and government support

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		44.999		-		44.999	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3432 / *NMMES-TR*

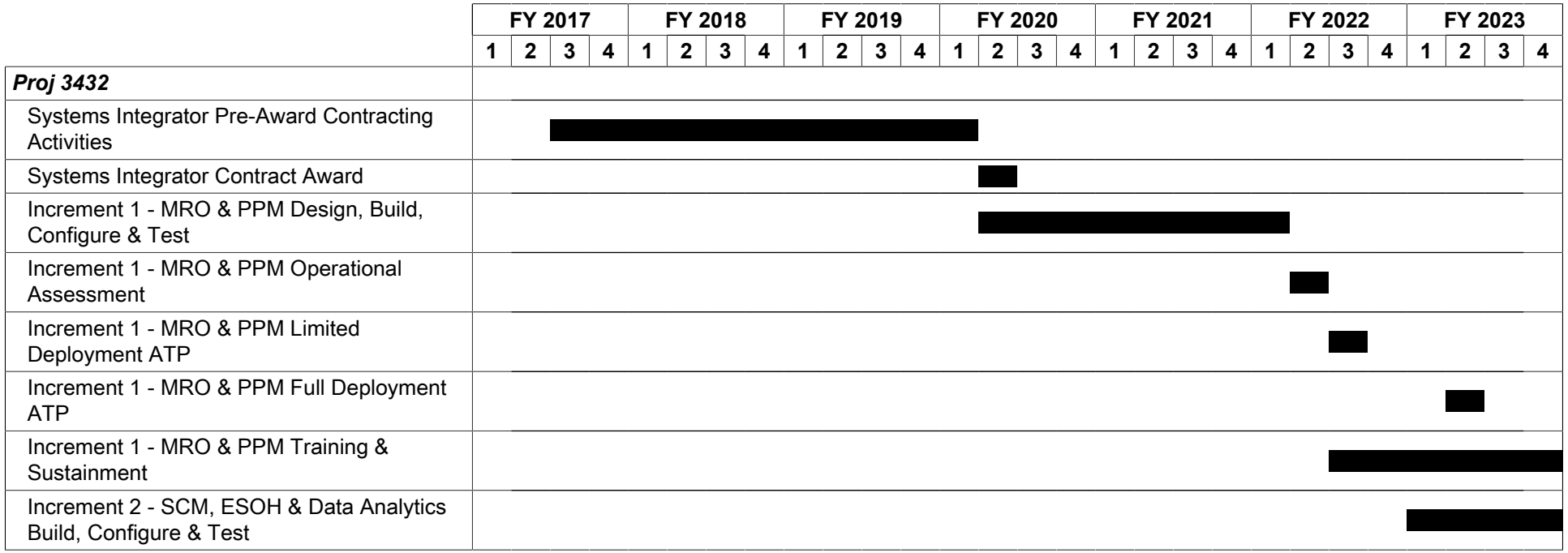


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 3432 / *NMMES-TR*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3432				
Systems Integrator Pre-Award Contracting Activities	3	2017	1	2020
Systems Integrator Contract Award	2	2020	2	2020
Increment 1 - MRO & PPM Design, Build, Configure & Test	2	2020	1	2022
Increment 1 - MRO & PPM Operational Assessment	2	2022	2	2022
Increment 1 - MRO & PPM Limited Deployment ATP	3	2022	3	2022
Increment 1 - MRO & PPM Full Deployment ATP	2	2023	2	2023
Increment 1 - MRO & PPM Training & Sustainment	3	2022	4	2023
Increment 2 - SCM, ESOH & Data Analytics Build, Configure & Test	1	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605013N / *Information Technology Development*	Project (Number/Name) 9406 / *Maintenance Data Warehouse*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9406: *Maintenance Data Warehouse*	38.190	9.820	4.461	28.362	-	28.362	44.191	54.654	21.051	30.621	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Aviation Data Warehouse/NAVAIR Decision Knowledge Programming for Logistics Analysis and Technical Evaluation (DECKPLATE) - The development of the DECKPLATE program is the next generation data warehouse for aircraft maintenance, flight, and usage data. It provides a web-based interface to a single source of information currently being stored in multiple Naval Aviation Logistics Data Analysis systems. Through the use of analysis, query, and reporting tools the user has the capabilities to effectively obtain readiness data in a near real-time environment, as well as providing historical data for long range planning, trend analysis and records analysis, records reconstruction, and compliance with technical directives. DECKPLATE supports the mission of the warfighter who requires a single source of near real-time aviation data in which to base critical readiness decisions. This requires collecting data from authoritative sources into a data warehouse. Because the warfighter only needs to access one database, the time consuming task of collecting various pieces of data from various sources will be reduced and ultimately eliminated. This improves data quality because it reduces the possibility of two systems providing identical data elements, but slightly different data. Data availability is improved through continuous near real-time feeds from the data sources, giving the warfighter the most current information to base decisions. In addition, this also accomplishes a reduction in legacy systems mandated by Office of the Chief of Naval Operations. DECKPLATE manages total inventory for two major categories of assets, Aircraft and Engine/Propulsion Systems/Modules (EPSMs).DECKPLATE is comprised of the Aircraft Inventory and Readiness Reporting (DECK-AIRRS) and the Engine Transaction Reporting (DECK-ETR) subsystems which provide the complete lifecycle for aircraft and Engine/ Propulsion System/Modules (EPSMs).

Condition Based Maintenance Plus (CBM+) - Funding supports the automated analysis and decision making processes, for the CBM+ Initiative which provides Naval Aviation Enterprise with common enabling capabilities which deliver timely data-driven decisional information to optimize aircraft availability and materiel readiness by incorporating health and usage leading indicators into the failure mode mitigation process, enabling the Warfighter to more efficiently meet mission requirements. The CBM+ Initiative increases readiness by streamlining maintenance processes, provide the sustainment base with timely, actionable logistics data not previously available, and enable engineers and acquisition professionals to support system improvements based on CBM+ acquired data results. CBM+ provides the enabling solutions needed to extend the life of current and new acquisition aircraft, realizing savings from reductions in field (organizational and intermediate) maintenance actions, reduced functional check flight hours, mishap mitigation, and reduced parts usage.

The Aviation Logistics Environment (ALE) program is the Naval Aviation Information Technology (IT) solution to deliver full lifecycle weapon system logistics and maintenance capabilities to the functional Naval Aviation Support Process (NASP). It will deliver these capabilities via a net centric, shared data environment that supports shore based, afloat, and expeditionary operations. The ALE integrates IT services plane-side and interfaces with infrastructure systems where necessary. ALE is a major logistics enterprise solution and a part of the total enterprise solution architecture. ALE is designed to structure IT services so that they can connect with other parts of the enterprise solution set, thus enabling an interoperable end-to-end business process. ALE consolidates Naval Aviation data into an integrated data environment for high level analysis. The purpose of ALE is to integrate, organize, and develop an underlying infrastructure and analytical capacity across the NASP in order to generate a holistic timely picture of readiness and condition for all T/M/S. ALE will be providing modern Product Lifecycle Management (PLM), Decision

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

Support (Predictive Analytics), Planeside Interfacing, and the Enterprise Infrastructure to support the NAE. The ALE program is a "system of systems" that will provide a common, integrated data environment that will enable NAE Vision 2020 data transparency across the Naval Aviation Enterprise; end-to-end process view to enable both consuming and providing on-demand information to stakeholders; a capability to view "digital twins" of all T/M/S for both allowable and as-configured states; a consolidation of aging, near-end-of-life systems and applications to modern technology and cost efficient support infrastructures; consistent and accurate weapons systems technical and CAD engineering documentation to support additive manufacturing capabilities; standardized metrics, algorithms, and business analysis tools; an architecture that enables migration to the cloud; and alignment to Information Assurance (IA) and Cybersecurity standards, and Risk Management Framework (RMF) compliance.

Vector (formally Integrated Logistics Management System (ILSMS)) supports the development of a common logistics analytical application that uses disciplined approach to Business Intelligence (BI) architecture that combines products, technology and methods aimed at key Naval Aviation Enterprise (NAE) business processes providing a single data source which focuses on aircraft readiness, maintenance, supply, cost, and man-hours. Vector provides naval aviation with a common source for approved key performance metrics and the capability to perform multi-system analysis of Ready for Tasking (RFT)/Ready Basic Aircraft (RBA) Gap drivers, 'Top-Down' aircraft systems analysis down to the component level, and identifies system performance trends early to mitigate future readiness and cost impacts to the fleet.

Dynamic Scheduling optimizes aircraft (BuNo specific), engine and component maintenance through task sequencing based on reliability and failure data, and asset utilization vice calendar directed maintenance. Aviation Logistics Environment (ALE) reduces ~33 disparate IT systems into a single unified governance ecosystem, and allows for modernization of existing software, hardware, and infrastructure in order to improve cyber readiness and support aircraft and weapons logistics information exchange requirements. Establishment of ALE provides the NAE one common Logistics IT solution for readiness reporting and maintenance at a reduced sustainment cost.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Aviation Data Warehouse/NAVAIR Decision Knowledge Programming for Logistics Analysis and Technical Evaluation (DECKPLATE)	2.468	1.487	1.971	0.000	1.971
Articles:	-	-	-	-	-
FY 2018 Plans: Complete the transition of ALS functionality into DECKPLATE so as to establish a central repository for aircraft maintenance and component information into DECKPLATE. Perform modifications to the DECKPLATE system to include Financial Improvement Audit Readiness data elements and Key Supporting Documentation to meet audit standards for Accountable Property System of Record (APSR) systems and meet additional Risk Management Framework (RMF) system controls..					
FY 2019 Base Plans: Develop additional financial management requirements for the DECKPLATE financial feeder systems, Engine Management and Aircraft Inventory Readiness and Reporting System (AIRRS), required as a result of ongoing audit assessments. Data aggregation capabilities and data source integration will be developed between					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
DECKPLATE and Vector to streamline data timeliness for NAE Business Intelligence and Data Analytics. These capabilities will improve the Naval Aviation Enterprise's ability to perform readiness analysis. Development will continue for the DECKPLATE Auto-Log set Phase II capabilities, which has the objective of providing improved algorithms, reduced data duplication, and extension of the life limits for aircraft components. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** DECKPLATE FY19 increase due to development of financial & supply stock data mapping between the Navy Business Information System (NBIS) and DECKPLATE (& DECKPLATE Auto-Log Set (ALS)).					
Title: Aviation Logistics Environment (ALE) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** FY19 efforts will be solidifying requirements, development of documentation to support the Naval Aviation Enterprise (NAE) and Vision 2020, and determining the base capabilities that need to be developed in order to support the Vision 2020 program schedule. The Aviation Logistics Environment (ALE) program will start modernizing existing software that will be maintained as part of the enterprise set of tools. ALE will be supporting the Digital Warfare Office (DWO) readiness initiatives by beginning the development of necessary IT tools, processes, and a common ground station. ALE will begin the development of an integrated data environment, and the determination of a Product Lifecycle Management solution set to support the NAE and additive manufacturing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase to begin the development of an integrated data environment, and the determination of a Product Lifecycle Management solution set to support the NAE and additive manufacturing.	0.000 -	0.000 -	20.500 -	0.000 -	20.500 -
Title: Condition Based Maintenance Plus (CBM+) ***Articles:***	7.352 -	2.974 -	4.031 -	0.000 -	4.031 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continue expansion of CBM+ Standard Data Repository (based on the Hadoop Distributed File System) in production to accommodate and make accessible all BIT/Parametric/Mechanical/Diagnostics data across NAVAIR smart weapon system platforms, and continue evolving other required CBM+ enablers identified by Systems Integration Process physical architecture and design outputs. Continue enhancements to the Enterprise Common CBM+ Environment (Ozone Widget Framework) and the integration of the environment's best-of-breed analytical tools, per the CBM+ Engineering Analysis Tool consolidation and reuse plan, with the large scale Distributed File System storage and analytics infrastructure. Further enable NAVAIR's Core Data Science IPT with massively large scale advanced Statistical Analysis capabilities (COTS and GOTS), while enabling select Organizational Level Maintenance activities with the wireless infrastructure, connectivity, and integrated technologies to improve the on-weapon system maintenance process. Continue the execution of CBM+ pilots and Proof of Concept efforts for identifying affordable/supportable Business Processes, Common IT Solutions, and data/tool integration to streamline the RCM process and expedite decision support using smart aircraft (HUMS) and other data sources within the Enterprise CBM+ Environment.					
FY 2019 Base Plans: Continue expansion of CBM+ Standard Data Repository (based on the Hadoop Distributed File System) in production to accommodate and make accessible all BIT/Parametric/Mechanical/Diagnostics data across all NAVAIR smart weapon system platforms, and continue evolving advanced analytic and Business Intelligence tools within the Enterprise Common CBM+ Environment (Ozone Widget Framework). Integration and enhancement efforts include scaling and widget enablement of Data Miner, Active Reporting Client (ARC), Mechanical Diagnostics Analysis Tool Navy (MDAN), and Regime Recognition analytic tools with the common storage and analytics environment. Integration of the environment's best of breed analytical tools will continue per the annual CBM+ Engineering Analysis Tool consolidation and reuse plan, including the migration of Regime Recognition from Oracle to Hadoop, further enabling the large scale storage and analytics environment. Further enable NAVAIRs Core Data Science IPT with massively large scale advanced Statistical Analysis capabilities (COTS and GOTS), standing up MatLab, Python, R, and Anaconda for integrated advanced analytics sandbox capability for rapid algorithm development, testing and fielding, while enabling select Organizational Level Maintenance activities at New River with a wireless infrastructure foundation tier using standard applications for configuration management and smart aircraft data movement, enabling integrated technologies in support					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
of plane side maintenance and sensor data collection and movement to improve the on-weapon system maintenance process. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** CBM FY19 increase due to extending common and scalable CBM+ storage and analytics infrastructure to support continued H-60R/S and H-53E dynamic component life limit extensions/reassessments, H-1 and other platform predictive maintenance capabilities. Directly supports NAVAIR's digital transformation, affordably enabling foundational enabling components of Sustainment Vision 2020 and Enterprise Digital Business Operations.					
Title: Dynamic Scheduling ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Develop the requirements baseline for Dynamic Scheduling to include, Concept of Operations, Department of Defense Architecture Framework, Business Process Reengineering, Functional Requirement Documents and Systems Engineering Plan. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase due to the addition of Dynamic Scheduling that optimizes aircraft (BuNo specific), engine and component maintenance through task sequencing based on reliability and failure data, and asset utilization vice calendar directed maintenance.	0.000 -	0.000 -	1.200 -	0.000 -	1.200 -
Title: Vector ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:***	0.000 -	0.000 -	0.660 -	0.000 -	0.660 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Development of Vector capabilities to satisfy requirements of Naval Aviation Enterprise customers to include: Identification of High Failure Components (Bad Actors); Resource Allocation Management Program (RAMP) system architecture migration; Weapons Munitions Readiness Analysis; Expanding system speed, capacity and Business Intelligence (BI); DEPOT Engine Analysis; Mission System trending analysis; NAVSUP Predictive Supply Digital Interface ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase for Vector capabilities to satisfy requirements of Naval Aviation Enterprise.					
Accomplishments/Planned Programs Subtotals	9.820	4.461	28.362	0.000	28.362

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN/4268/DECKPLATE: *Other Aviation Support Equipment*	1.704	1.870	2.049	-	2.049	2.083	2.117	2.155	2.202	Continuing	Continuing
• OPN/4268/CBM: *Other Aviation Support Equipment*	0.198	0.199	0.216	-	0.216	0.286	0.291	0.298	0.303	Continuing	Continuing

Remarks

D. Acquisition Strategy

Aviation Data Warehouse/NAVAIR Decision Knowledge Programming for Logistics Analysis and Technical Evaluation (DECKPLATE) - Development services will be awarded using a competitively awarded contract under the Seaport Contract System containing a matrix of tasks and required levels of performance. Follow on Contract will utilize the same competitive system. The Services provided under the contract support acquisition will not encompass tasks inherently Governmental in nature. The Statement of Work will include a matrix that establishes the minimum acceptable performance standards.

Condition Based Maintenance Plus (CBM+) - Development services will be provided using a competitively awarded contracts coordinated via NAVAIR's Aviation Logistics Environment (ALE) Program Management and supporting Contract Business Office, and will contain a matrix of tasks and required levels of performance. Follow on Contracts will utilize the same competitive system. The Services provided under the contract support acquisition will not encompass tasks inherently Governmental in nature, and Statements of Work will include a matrix that establishes the minimum acceptable performance standards.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

Aviation Logistics Environment (ALE)- Development services will be awarded using a competitively awarded contract that will contain a matrix of tasks and required levels of performance. Follow on contracts will also follow the same competitive system. The Services provided under the contract support acquisitions will not encompass tasks inherently Governmental in nature and the Statements of Work will include a matrix that establishes the minimum acceptable performance standards.

Vector-Development services will be awarded using a competitively awarded contract that will contain a matrix of tasks and required levels of performance. Follow on contracts will also follow the same competitive system. The Services provided under the contract support acquisitions will not encompass tasks inherently Governmental in nature and the Statements of Work will include a matrix that establishes the minimum acceptable performance standards.

Dynamic Scheduling - Development services will be awarded using a competitively awarded contract under the Seaport Contract System containing a matrix of tasks and required levels of performance. Follow on Contract will utilize the same competitive system. The Services provided under the contract support acquisition

E. Performance Metrics

The following performance metrics apply to Aviation Data Warehouse/NAVAIR Decision Knowledge Programming for Logistics Analysis and Technical Evaluation (DECKPLATE), Condition Based Maintenance (CBM+), Vector, Aviation Logistics Environment (ALE) and Dynamic Scheduling:

1. Metric - During the life of the contract verify conformance with agency specific information processing standards and functional requirements. Prior to delivery of enhanced software, demonstrate the operational capability of the system software. Standard - Functionality of the software to meet required systems architecture and processing capabilities. Max Deviation Allowed - All requirements mandated by law or regulation must be 100% compliant. Quality Assurance - Independent Verification and Validation (IV&V) for testing new releases of software to determine that previous functionality is maintained. Customer satisfaction as measured through limited validated customer complaints, feedback, and surveys.
2. Metric - Interfaces must maintain compatibility among system components in the operational environment. Standard - Service Levels for software: Throughput in terms of processing response time, number of transactions processed per second; volume of data processed over time. Compatibility with particular hardware and software within the existing processing environment. Functionality of software to meet required systems architecture and processing capabilities. Max Deviation Allowed - None. Quality Assurance - Customer satisfaction as measured through limited validated customer complaints, feedback and surveys. Operational monitoring by use of system statistics and logs. IV&V for testing new software, including verifying results to determine that requirements and specifications are met.
3. Metric - Documentation for deliverables must match the agency specific system processing and operational procedures. Standard - Documentation meets agency specific formats for accuracy and completeness. Max Deviation Allowed - None. Quality Assurance - IV&V for determining that documentation delivered by the contractor matches the system processing and operational procedures.
4. Metric - Meet delivery dates/milestones. Period of Performance will be 12 months from the date of award. Standard - Delivery dates are met, or exceeded. Max Deviation Allowed - None. Quality Assurance - 100% inspection.
5. Metric - Security. Standard - Meet all Government and agency specific requirements. Max Deviation Allowed - None. Quality Assurance - 100% inspection to ensure that all Government and Agency specific requirements have been met. Independent verification of security procedures defined by agency (could be performed by a third party, or another agency according to current security regulations and measures).
6. Metric - Enhancement to software shall not adversely affect system performance. Standard - Standards affecting system performance include but are not limited to: response time for resolving problems; central processing unit busy; response time; memory utilization; storage utilization. Max Deviation Allowed - Base line functionality is met at 100%. Non critical functionality is met at 95%. Quality Assurance - Operational monitoring by use of system statistics and logs.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

7. Metric - New releases of software must maintain previously provided functionality, while providing enhanced capabilities, or systems corrections. Standard - Software adds value and improves existing functionality without negatively impacting the existing operational environment. Max Deviation Allowed - Base line functionality is met at 100%. Non critical functionality is met at 95%. Quality Assurance - Independent Verification and Validation for testing new releases of software to determine that previous functionality is improved. Customer satisfaction is measured through validated customer complaints and surveys.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Prod Def no longer funded in the FYDP	Various	Various : Various	16.255	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Development for Aviation Logistics Environment (ALE)	Various	Various : Various	0.000	0.000		0.000		17.800	Dec 2018	-		17.800	Continuing	Continuing	Continuing
Software Development for Decision Knowledge Programming for Logistics Analysis and Technical Evalutaion (DECKPLATE)	C/CPFF	Spalding : Lexington Park, MD	3.847	1.823	Nov 2016	0.588	Nov 2017	0.882	Nov 2018	-		0.882	Continuing	Continuing	Continuing
Softare Development for Condition Based Maintenance PLus 9CBM +)	Various	Various : Various	10.451	6.721	Nov 2016	2.614	Nov 2017	3.511	Nov 2018	-		3.511	Continuing	Continuing	Continuing
Software Development for Vector	MIPR	Wyle : Patuxent River, MD	0.000	0.000		0.000		0.594	Dec 2018	-		0.594	Continuing	Continuing	Continuing
Software development for Dynamic Scheduling	Various	Various : Various	0.000	0.000		0.000		1.000	Jan 2019	-		1.000	Continuing	Continuing	Continuing
		Subtotal	30.553	8.544		3.202		23.787		-		23.787	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support for DECKPLATE	WR	NAWCAD : Patuxent River, MD	5.209	0.917	Oct 2016	0.899	Oct 2017	1.089	Oct 2018	-		1.089	Continuing	Continuing	Continuing
Prior year Prod Def no longer funded in the FYDP	Various	Various : Various	0.628	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Program Management Support for CBM+	WR	NAWCAD : Patuxent River, MD	1.800	0.359	Oct 2016	0.360	Oct 2017	0.520	Oct 2018	-		0.520	Continuing	Continuing	Continuing
Program Management Support for Aviation	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		2.700	Oct 2018	-		2.700	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

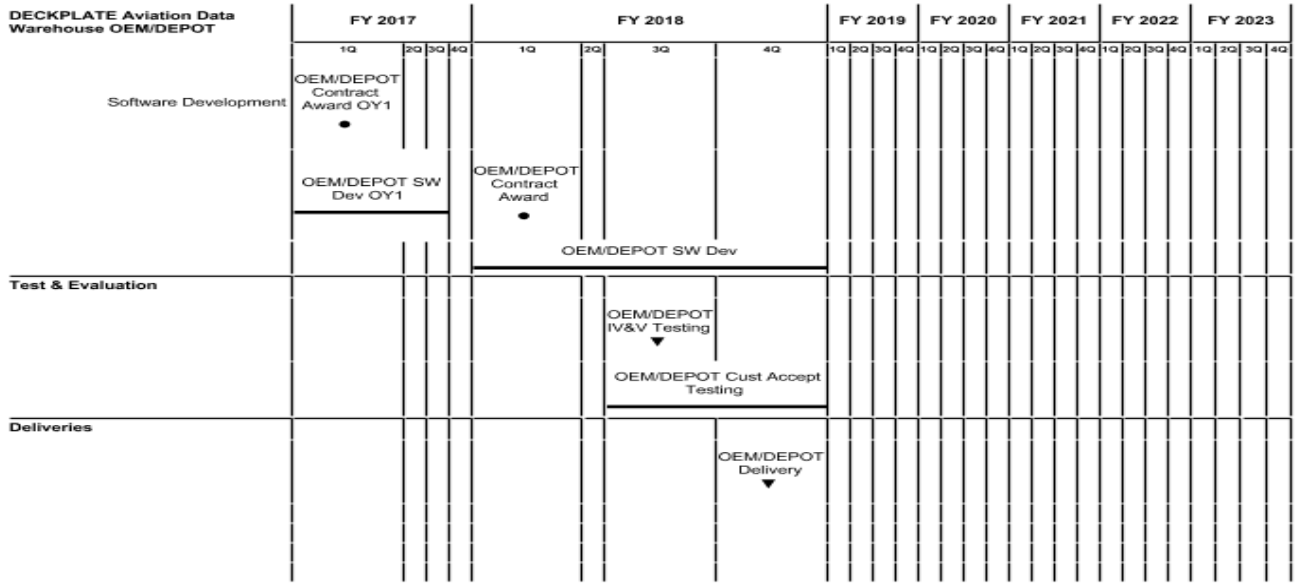
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Logistics Environment (ALE)															
Program Management Support for Vector	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.066	Oct 2018	-		0.066	Continuing	Continuing	Continuing
Program Management Support for Dynamic Scheduling	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.200	Oct 2018	-		0.200	Continuing	Continuing	Continuing
		Subtotal	7.637	1.276		1.259		4.575		-		4.575	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	38.190	9.820		4.461		28.362		-		28.362	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*



2019PB - 0605013N - 9406

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

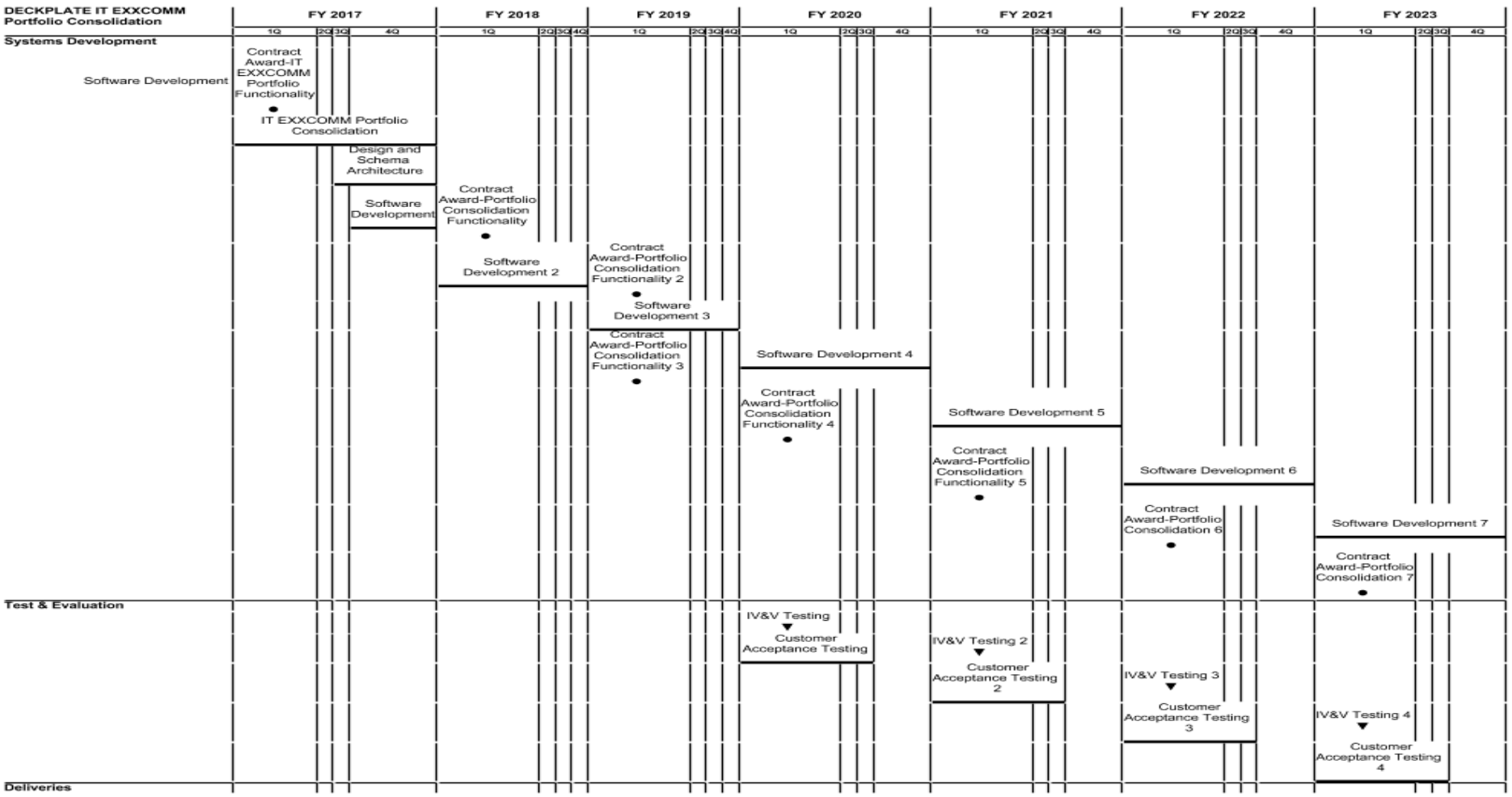


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
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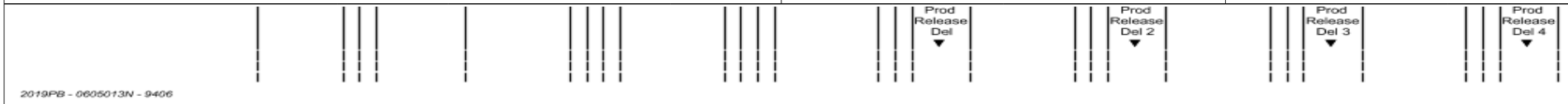


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

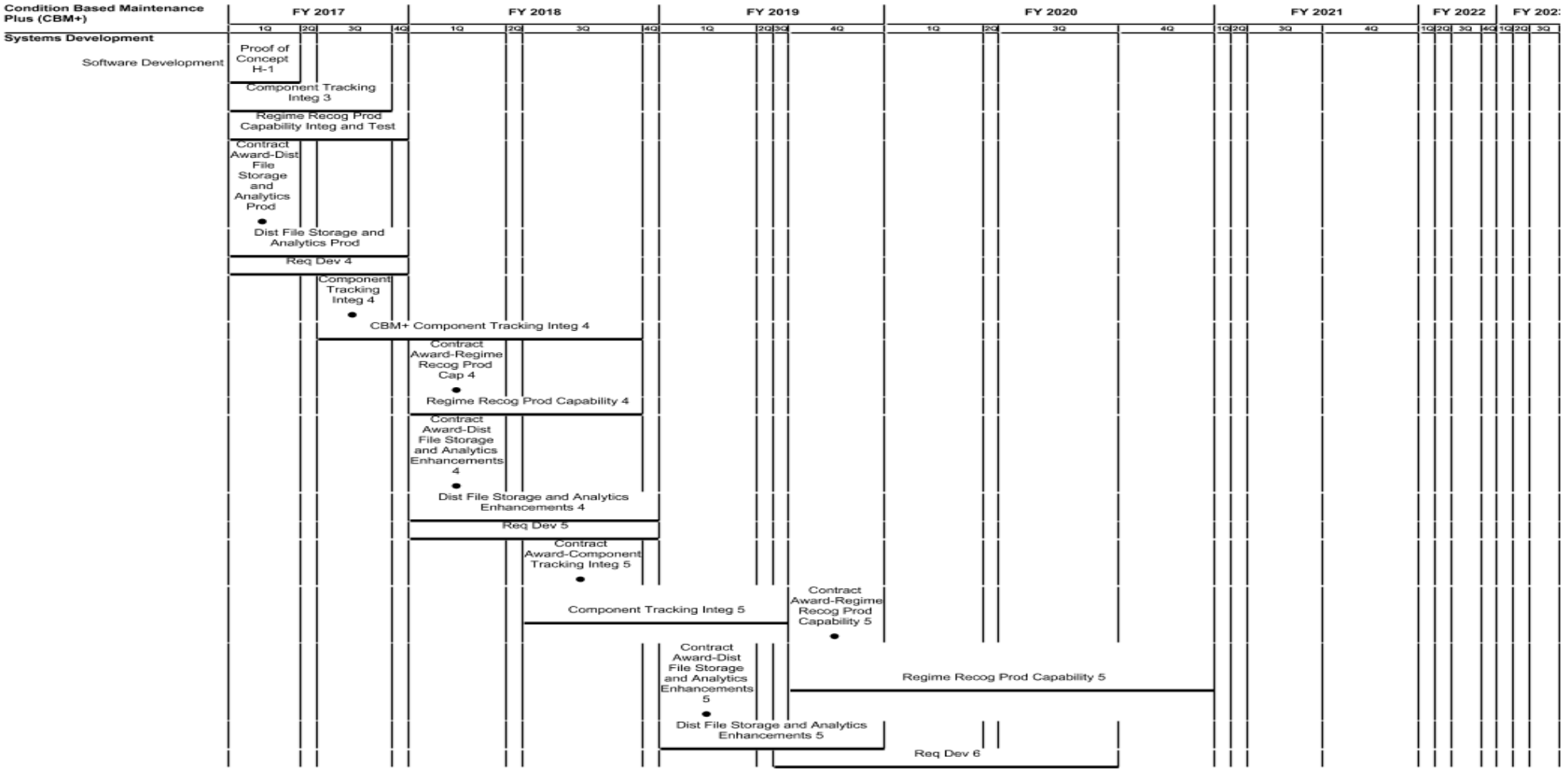


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

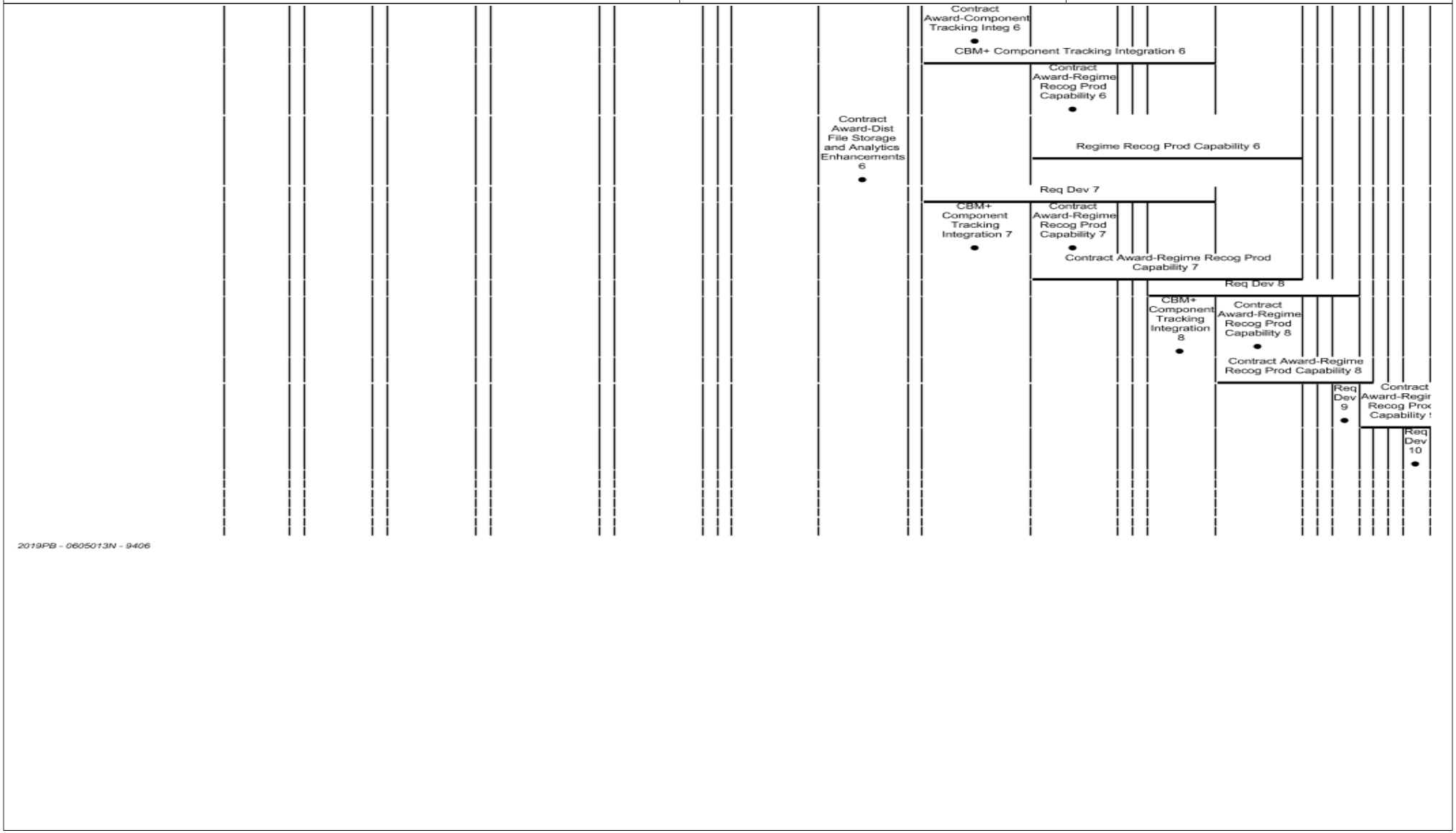
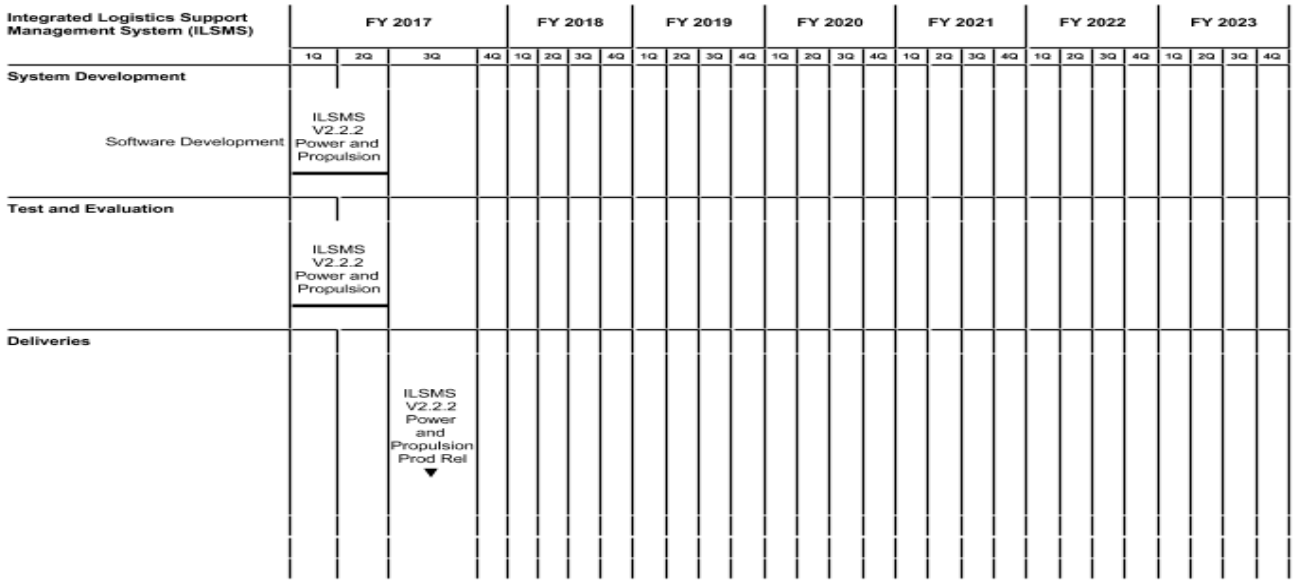
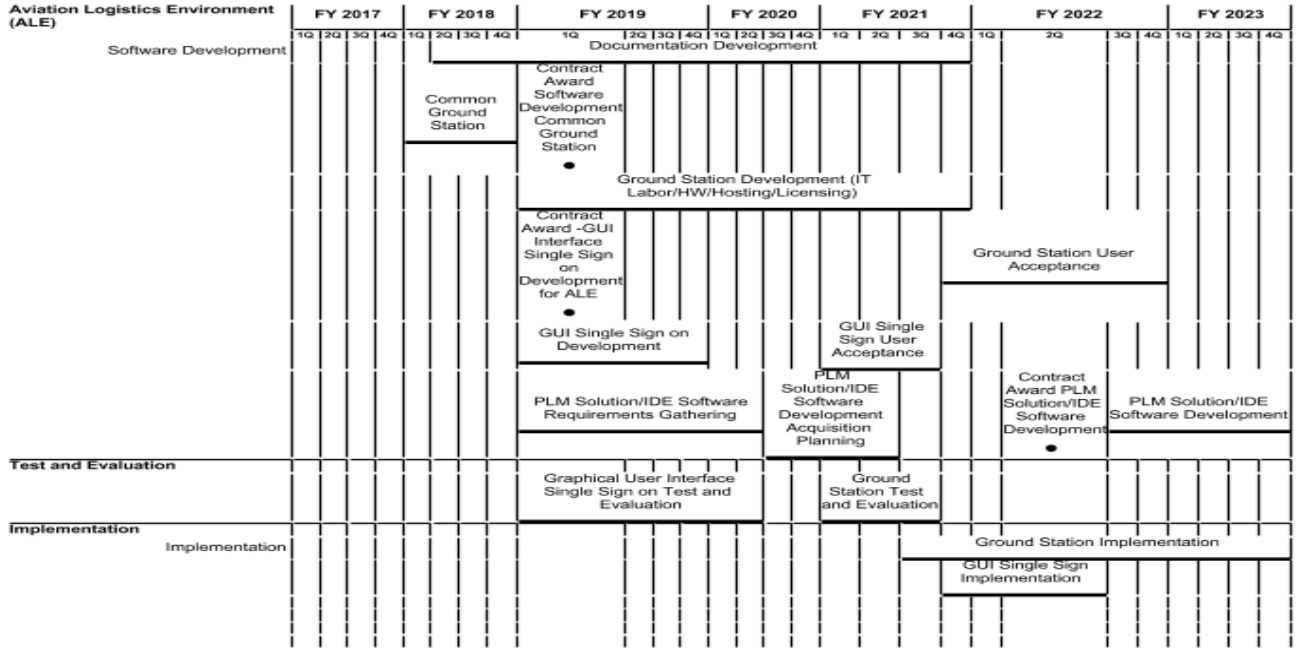


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*



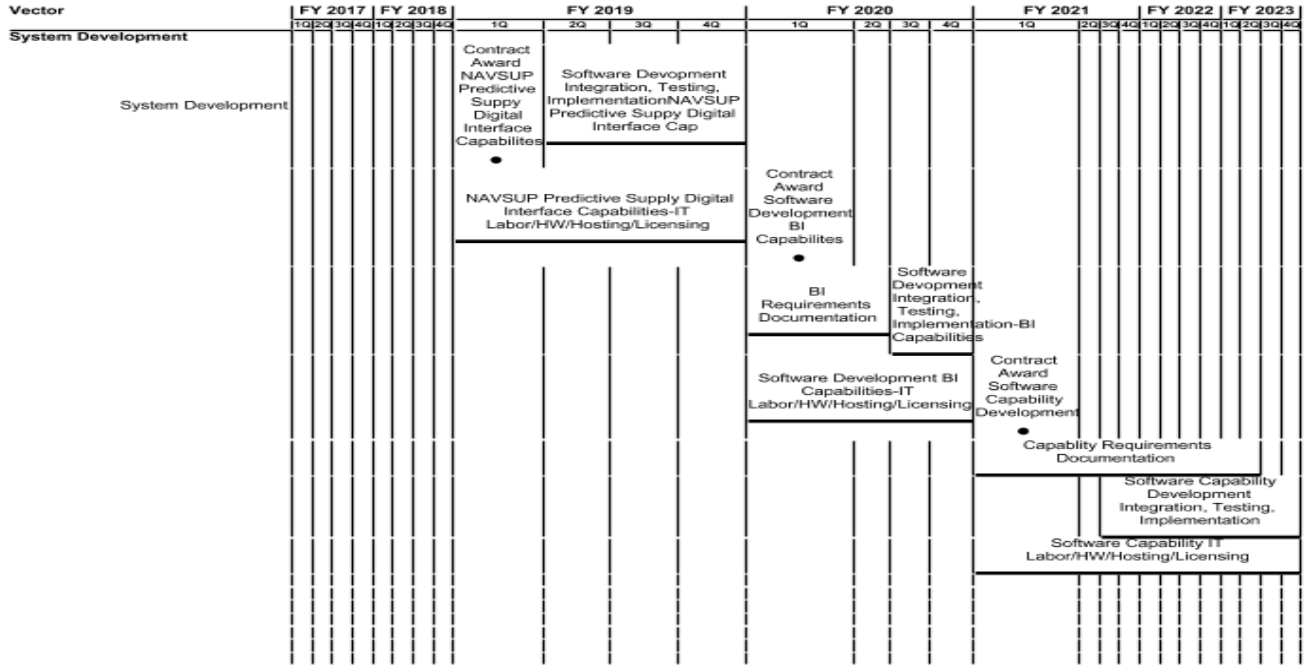
2019PB - 0605013N - 9406

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*



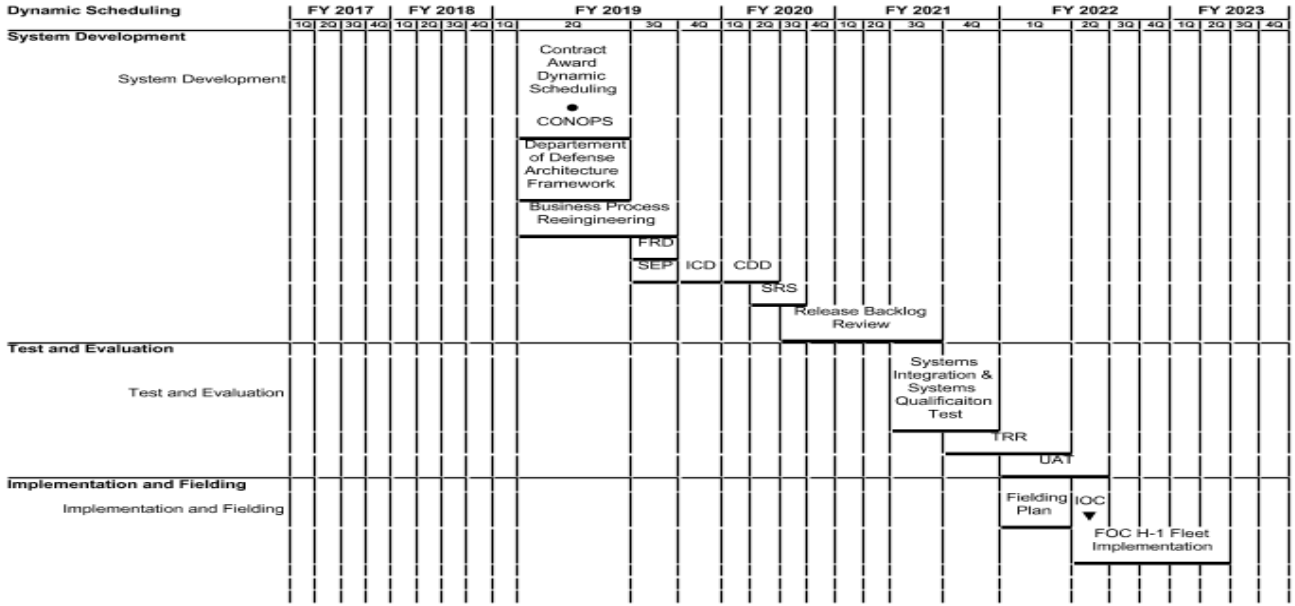
2019PB - 0605013N - 9406

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*



2019PB - 0605013N - 9406

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*



2019PB - 0605013N - 9406

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
DECKPLATE Aviation Data Warehouse OEM/DEPOT				
Software Development: Contract Award OEM/DEPOT Reporting into DECKPLATE OY1	1	2017	1	2017
Software Development: OEM/DEPOT Software Development OY1	1	2017	3	2017
Software Development: Contract Award OEM/DEPOT Reporting into DEKCPLATE	1	2018	1	2018
Software Development: OEM/DEPOT Software Development	1	2018	4	2018
Test & Evaluation: OEM/DEPOT IV&V Testing	3	2018	3	2018
Test & Evaluation: OEM/DEPOT Customer Acceptance Testing	3	2018	4	2018
Deliveries: OEM/DEPOT Production Release Delivery	4	2018	4	2018
DECKPLATE IT EXXCOMM Portfolio Consolidation				
Systems Development: Software Development: Contract Award-DECKPLATE IT EXXCOMM Portfolio Functionality	1	2017	1	2017
Systems Development: Software Development: DECKPLATE IT EXXCOMM Portfolio Consolidation	1	2017	4	2017
Systems Development: Software Development: DECKPLATE Design and Schema Architecture	3	2017	4	2017
Systems Development: Software Development: DECKPLATE Software Development	4	2017	4	2017
Systems Development: Software Development: Contract Award-DECKPLATE IT EXXCOMM Portfolio Consolidation Functionality	1	2018	1	2018
Systems Development: Software Development: DECKPLATE Software Development 2	1	2018	4	2018
Systems Development: Software Development: Contract Award-DECKPLATE IT EXXCOMM Portfolio Consolidation Functionality 2	1	2019	1	2019
Systems Development: Software Development: DECKPLATE Software Development 3	1	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Software Development: Contract Award-DECKPLATE IT EXXCOMM Portfolio Consolidation Functionality 3	1	2019	1	2019
Systems Development: Software Development: DECKPLATE Software Development 4	1	2020	4	2020
Systems Development: Software Development: Contract Award-DECKPLATE IT EXXCOMM Portfolio Consolidation Functionality 4	1	2020	1	2020
Systems Development: Software Development: DECKPLATE Software Development 5	1	2021	4	2021
Systems Development: Software Development: Contract Award-DECKPLATE IT EXXCOMM Portfolio Consolidation Functionality 5	1	2021	1	2021
Systems Development: Software Development: DECKPLATE Software Development 6	1	2022	4	2022
Systems Development: Software Development: Contract Award-DECKPLATE IT EXXCOMM Portfolio Consolidation Functionality 6	1	2022	1	2022
Systems Development: Software Development: DECKPLATE Software Development 7	1	2023	4	2023
Systems Development: Software Development: Contract Award-DECKPLATE IT EXXCOMM Portfolio Consolidation Functionality 7	1	2023	1	2023
Test & Evaluation: DECKPLATE IV&V Testing	1	2020	1	2020
Test & Evaluation: DECKPLATE Customer Acceptance Testing	1	2020	3	2020
Test & Evaluation: DECKPLATE IV&V Testing 2	1	2021	1	2021
Test & Evaluation: DECKPLATE Customer Acceptance Testing 2	1	2021	3	2021
Test & Evaluation: DECKPLATE IV&V Testing 3	1	2022	1	2022
Test & Evaluation: DECKPLATE Customer Acceptance Testing 3	1	2022	3	2022
Test & Evaluation: DECKPLATE IV&V Testing 4	1	2023	1	2023
Test & Evaluation: DECKPLATE Customer Acceptance Testing 4	1	2023	3	2023
Deliveries: DECKPLATE Production Release Delivery	4	2020	4	2020
Deliveries: DECKPLATE Production Release Delivery 2	4	2021	4	2021
Deliveries: DECKPLATE Production Release Delivery 3	4	2022	4	2022
Deliveries: DECKPLATE Production Release Delivery 4	4	2023	4	2023
Condition Based Maintenance Plus (CBM+)				

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Software Development: CBM+ Environment Proof of Concept H-1	1	2017	1	2017
Systems Development: Software Development: CBM+ Component Tracking Integration 3	1	2017	3	2017
Systems Development: Software Development: CBM+ Regime Recognition Production Capability Integration and Test	1	2017	4	2017
Systems Development: Software Development: Contract Award-CBM+ Distributed File Storage and Analytics Production	1	2017	1	2017
Systems Development: Software Development: CBM+ Distributed File Storage and Analytics Production	1	2017	4	2017
Systems Development: Software Development: CBM+ Requirements Development 4	1	2017	4	2017
Systems Development: Software Development: Contract Award-CBM+ Component Tracking Integration 4	3	2017	3	2017
Systems Development: Software Development: CBM+ Component Tracking Integration 4	3	2017	3	2018
Systems Development: Software Development: Contract Award-CBM+ Regime Recognition Production Capability 4	1	2018	1	2018
Systems Development: Software Development: CBM+ Regime Recognition Production Capability 4	1	2018	3	2018
Systems Development: Software Development: Contract Award-CBM+ Distributed File Storage and Analytics Enhancements 4	1	2018	1	2018
Systems Development: Software Development: CBM+ Distributed File Storage and Analytics Enhancements 4	1	2018	4	2018
Systems Development: Software Development: CBM+ Requirements Development 5	1	2018	4	2018
Systems Development: Software Development: Contract Award-CBM+ Component Tracking Integration 5	3	2018	3	2018
Systems Development: Software Development: CBM+ Component Tracking Integration 5	3	2018	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Software Development: Contract Award-CBM+ Regime Recognition Production Capability 5	4	2019	4	2019
Systems Development: Software Development: CBM+ Regime Recognition Production Capability 5	4	2019	4	2020
Systems Development: Software Development: Contract Award-CBM+ Distributed File Storage and Analytics Enhancements 5	1	2019	1	2019
Systems Development: Software Development: CBM+ Distributed File Storage and Analytics Enhancements 5	1	2019	4	2019
Systems Development: Software Development: CBM+ Requirements Development 6	3	2019	3	2020
Systems Development: Software Development: Contract Award-CBM+ Component Tracking Integration 6	3	2020	3	2020
Systems Development: Software Development: CBM+ Component Tracking Integration 6	3	2020	3	2021
Systems Development: Software Development: Contract Award-CBM+ Regime Recognition Production Capability 6	4	2020	4	2020
Systems Development: Software Development: CBM+ Regime Recognition Production Capability 6	4	2020	4	2021
Systems Development: Software Development: Contract Award-CBM+ Distributed File Storage and Analytics Enhancements 6	1	2020	1	2020
Systems Development: Software Development: CBM+ Requirements Development 7	3	2020	3	2021
Systems Development: Software Development: Contract Award-CBM+ Component Tracking Integration 7	3	2020	3	2020
Systems Development: Software Development: CBM+ Component Tracking Integration 7	4	2020	4	2020
Systems Development: Software Development: Contract Award-CBM+ Regime Recognition Production Capability 7	4	2020	4	2021
Systems Development: Software Development: CBM+ Requirements Development 8	3	2021	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Software Development: Contract Award-CBM+ Component Tracking Integration 8	3	2021	3	2021
Systems Development: Software Development: CBM+ Component Tracking Integration 8	4	2021	4	2021
Systems Development: Software Development: Contract Award-CBM+ Regime Recognition Production Capability 8	4	2021	4	2022
Systems Development: Software Development: CBM+ Requirements Development 9	3	2022	3	2022
Systems Development: Software Development: Contract Award-CBM+ Regime Recognition Production Capability 9	4	2022	4	2023
Systems Development: Software Development: CBM+ Requirements Development 10	3	2023	3	2023
Integrated Logistics Support Management System (ILSMS)				
System Development: Software Development: V2.2.2 ILSMS Power and Propulsion Software Development	1	2017	2	2017
Test and Evaluation: ILSMS V2.2.2 Power and Propulsion Test and Evaluation	1	2017	2	2017
Deliveries: ILSMS V2.2.2 Power and Propulsion Production Release	3	2017	3	2017
Aviation Logistics Environment (ALE)				
Software Development: Software Documentation Development	2	2018	4	2021
Software Development: Software Requirements Gathering -Common Ground Station	1	2018	4	2018
Software Development: Contract Award Software Development Common Ground Station	1	2019	1	2019
Software Development: Ground Station Development (IT Labor/HW/Hosting/Licensing)	1	2019	4	2021
Software Development: Ground Station User Acceptance	4	2021	4	2022
Software Development: Contract Award -Graphical User Interface Single Sign on Development for ALE	1	2019	1	2019
Software Development: Graphical User Interface Interface Single Sign on Development	1	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Software Development: Graphical User Interface Interface Single Sign User Acceptance	1	2021	3	2021
Software Development: PLM Solution/IDE Software Requirements Gathering	1	2019	2	2020
Software Development: PLM Solution/IDE Software Development Acquisition Planning	3	2020	2	2021
Software Development: Contract Award PLM Solution/IDE Software Development	2	2022	2	2022
Software Development: PLM Solution/IDE Software Development	3	2022	4	2023
Test and Evaluation: Graphical User Interface Single Sign on Test and Evaluation	1	2019	2	2020
Test and Evaluation: Ground Station Test and Evaluation	1	2021	3	2021
Implementation: Implementation: Ground Station Implementation	3	2021	4	2023
Implementation: Implementation: Graphical User Interface Single Sign Implementation	4	2021	2	2022
Vector				
System Development: System Development: Software Development Contract Award-NAVSUP Predictive Suppy Digital Interface Capabilites	1	2019	1	2019
System Development: System Development: Software Development Integration, Testing, Implementation-NAVSUP Predictive Suppy Digital Interface Capabilites	2	2019	4	2019
System Development: System Development: Software DevelopmentNAVSUP Predictive Supply Digital Interface Capabilities-IT Labor/HW/Hosting/Licensing	1	2019	4	2019
System Development: System Development: Contract Award Software Development BI Capabilites	1	2020	1	2020
System Development: System Development: Requirements Documentation Capability Development of Business Intelligence (BI) Capabilities	1	2020	2	2020
System Development: System Development: Software Development Integration, Testing, Implementation-BI Capabilities	3	2020	4	2020
System Development: System Development: Software Development BI Capabilities-IT Labor/HW/Hosting/Licensing	1	2020	4	2020
System Development: System Development: Contract Award Software Capability Development	1	2021	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: System Development: Software Capablity Requirements Documentation	1	2021	2	2023
System Development: System Development: Software Capability Development Integration, Testing, Implementation	3	2021	4	2023
System Development: System Development: Software Capability IT Labor/HW/ Hosting/Licensing	1	2021	4	2023
Dynamic Scheduling				
System Development: System Development: Contract Award Dynamic Scheduling	2	2019	2	2019
System Development: System Development: Concept of Operations (CONOPS)	2	2019	2	2019
System Development: System Development: Department of Defense Architecture Framework	2	2019	2	2019
System Development: System Development: Business Process Reeingineering	2	2019	3	2019
System Development: System Development: Functional Reqwuirements Document (FRD)	3	2019	3	2019
System Development: System Development: Systems Engineering Plan (SEP)	3	2019	3	2019
System Development: System Development: Interface Control Dcoument (ICD)	4	2019	4	2019
System Development: System Development: Change Description Document (CDD)	1	2020	2	2020
System Development: System Development: System Requirements Specificaiton (SRS)	2	2020	3	2020
System Development: System Development: Release Backlog Review	3	2020	3	2021
Test and Evaluation: Test and Evaluation: Development Testing	3	2021	4	2021
Test and Evaluation: Test and Evaluation: Test Readiness Review (TRR)	4	2021	1	2022
Test and Evaluation: Test and Evaluation: User Acceptance Testing (UAT)	1	2022	2	2022
Implementation and Fielding: Implementation and Fielding: Fielding Plan	1	2022	1	2022
Implementation and Fielding: Implementation and Fielding: Initial Operational Capability (IOC) Single Squadron	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605013N / *Information Technology Development*	**Project (Number/Name)** 9406 / *Maintenance Data Warehouse*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Implementation and Fielding: Implementation and Fielding: Full Operation Capability (FOC) (H-1 Fleet Implementation)	2	2022	2	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605024N *I (U)Anti-Tamper Technology Support*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.500	3.410	5.618	-	5.618	6.252	7.175	7.313	7.464	Continuing	Continuing
2801: *Anti-Tamper*	0.000	0.000	0.000	1.379	-	1.379	1.404	1.433	1.463	1.492	Continuing	Continuing
3414: *Anti-Tamper Technology Support*	0.000	0.500	3.410	4.239	-	4.239	4.848	5.742	5.850	5.972	Continuing	Continuing

Note

PU 2801 moved in FY19 from 0605853N

A. Mission Description and Budget Item Justification

Develops new and novel Anti-Tamper technologies for all Department of Navy weapon and combat systems. The technologies to be developed will be new countermeasures to prevent reverse engineering of critical U.S. military systems. The technologies include secure processing, sensors, architecture components, and enabling technologies.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	2.500	3.410	4.318	-	4.318
Current President's Budget	0.500	3.410	5.618	-	5.618
Total Adjustments	-2.000	0.000	1.300	-	1.300
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	1.389	-	1.389
• Rate/Misc Adjustments	0.000	0.000	-0.089	-	-0.089
• Congressional Directed Reductions Adjustments	-2.000	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605024N *I (U)Anti-Tamper Technology Support*

Change Summary Explanation

Schedule: Not Applicable

Technical: Not Applicable

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605024N / *(U)Anti-Tamper Technology Support*	Project (Number/Name) 2801 / *Anti-Tamper*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2801: *Anti-Tamper*	0.000	0.000	0.000	1.379	-	1.379	1.404	1.433	1.463	1.492	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

PU moved from 0605853N starting in FY19

A. Mission Description and Budget Item Justification

Anti-Tamper Program - performs as the Navy Technical Process Owner for the Anti Tamper systems engineering activity that is intended to prevent and/or delay the exploitation of critical technologies in U.S. systems; manages the research, design, development, implementation, and testing of Anti Tamper measures and coordinates with Department of Defense Anti Tamper Executive Agent.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Anti Tamper Support	0.000	0.000	1.379	0.000	1.379
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Continue championing new technology with a focused and disciplined approach of development, assessment, evaluation, and transition to meet Navy program AT requirements. Maintain role in Anti-Tamper policy development for implementation and execution by the SYSCOMs incorporating Navy program AT requirements. Provide secure facilities, networks, computers, video/telephone conference and support personnel for collateral and Special Program operational environments to enable Anti-Tamper (AT) implementation and execution by SYSCOM's programs, incorporating AT requirements.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The increase of $1.379M is due to a Project Unit consolidation from PE 0605853N to PE 0605024N. This funding will provide development, assessment, evaluation, and transition in order to meet the Navy program Anti Tamper requirements.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	1.379	0.000	1.379

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605024N / *(U)Anti-Tamper Technology Support*	**Project (Number/Name)** 2801 / *Anti-Tamper*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The program will fund project to provide secure facilities, networks, computers, video/telephone conference and support personnel for collateral and Special Program operational environments

E. Performance Metrics

Manage the research, design, development, implementation and testing of Anti-Tamper measures for the Department of the Navy. Manage Information Security for all navy programs throughout their lifecycles.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605024N / *(U)Anti-Tamper Technology Support*	Project (Number/Name) 2801 / *Anti-Tamper*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		1.079	Dec 2018	-		1.079	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.079		-		1.079	Continuing	Continuing	N/A

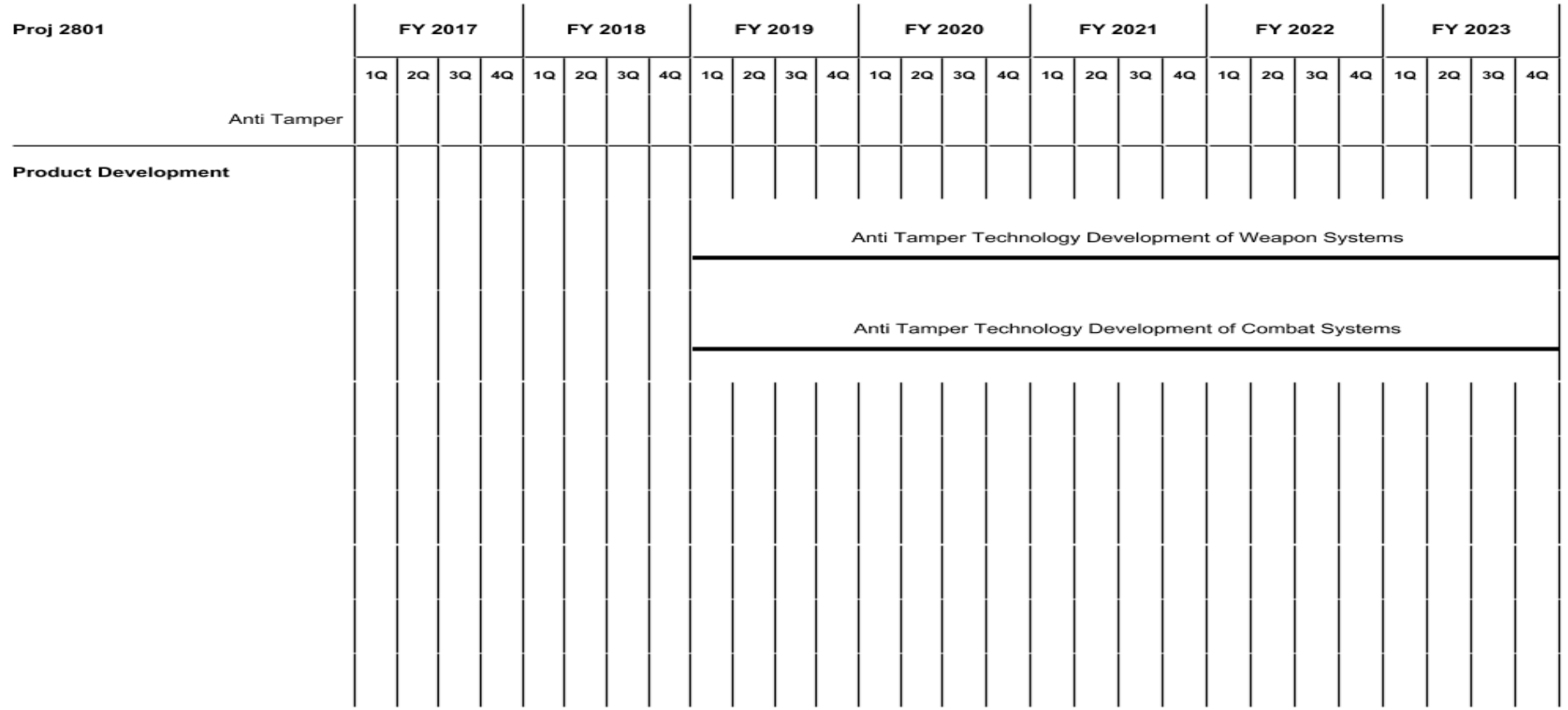
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.300	Nov 2018	-		0.300	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.300		-		0.300	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		1.379		-		1.379	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605024N / *(U)Anti-Tamper Technology Support*	**Project (Number/Name)** 2801 / *Anti-Tamper*



2019OSD - 0605024N - 2801

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605024N / *(U)Anti-Tamper Technology Support*	**Project (Number/Name)** 2801 / *Anti-Tamper*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2801				
Product Development: Anti Tamper Technology Development of Weapon Systems	1	2019	4	2023
Product Development: Anti Tamper Technology Development of Combat Systems	1	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605024N / *(U)Anti-Tamper Technology Support*	Project (Number/Name) 3414 / *Anti-Tamper Technology Support*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3414: *Anti-Tamper Technology Support*	0.000	0.500	3.410	4.239	-	4.239	4.848	5.742	5.850	5.972	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

New start

A. Mission Description and Budget Item Justification

This project develops new and novel Anti-Tamper technologies for all Department of Navy weapon and combat systems. The technologies to be developed will be new countermeasures to prevent reverse engineering of critical U.S. military systems. The technologies include secure processing, sensors, architecture components, and enabling technologies. Low technology readiness level projects will be tested for maturation and implemented to protect US technologies. Government laboratory expertise will mature in Anti Tamper technologies and techniques. Integration of various techniques will enhance the strength of the protection scheme which limits the opportunities to exploit our technological advantage on the battlefield.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Anti Tamper Technology Development	0.500	3.410	4.239	0.000	4.239
Articles:	-	-	-	-	-
Description: This project develops new and novel Anti-Tamper technologies for all Department of Navy weapon and combat systems. The technologies to be developed will be new countermeasures to prevent reverse engineering of critical U.S. military systems. The technologies include secure processing, sensors, secure architecture components, and enabling technologies.					
FY 2018 Plans: Continue development of new and novel technologies that will become reverse engineering countermeasures for Department of the Navy (DoN) weapon and combat systems. The project will include awarding technology development contracts and securing engineering support from DoN engineering facilities. Test and perform technical evaluations of low technical readiness level projects for implementation to protect US technologies.					
FY 2019 Base Plans: Continue development of new and novel technologies that will become reverse engineering countermeasures for Department of the Navy (DoN) weapon and combat systems. The project will include awarding technology					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605024N / *(U)Anti-Tamper Technology Support*	**Project (Number/Name)** 3414 / *Anti-Tamper Technology Support*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
development contracts and securing engineering support from DoN engineering facilities. Test and perform technical evaluations of low technical readiness level projects for implementation to protect US technologies. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase of $0.829M will allow for development of new countermeasures in support of Anti-Tamper technologies.					
Accomplishments/Planned Programs Subtotals	0.500	3.410	4.239	0.000	4.239

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-ACAT program. The strategy will be to issue technology development contracts and use Department of Navy (DoN)labs for technology development, along with using DoN engineering organizations for engineering support.

E. Performance Metrics

The project will fund between 4 and 8 technology development projects that will be focused on bringing anti-tamper technologies that transition to the DoN programs. The project will have a greater than 67% transition rate.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605024N / *(U)Anti-Tamper Technology Support*	Project (Number/Name) 3414 / *Anti-Tamper Technology Support*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Dev	WR	NAWCWD : China Lake, CA	0.000	0.500	Jun 2017	2.000	Nov 2017	2.955	Nov 2018	-		2.955	Continuing	Continuing	Continuing
		Subtotal	0.000	0.500		2.000		2.955		-		2.955	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NAWCWD : China Lake, CA	0.000	0.000		1.410	Nov 2017	1.284	Nov 2018	-		1.284	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		1.410		1.284		-		1.284	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.500		3.410		4.239		-		4.239	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605024N / *(U)Anti-Tamper Technology Support*	**Project (Number/Name)** 3414 / *Anti-Tamper Technology Support*

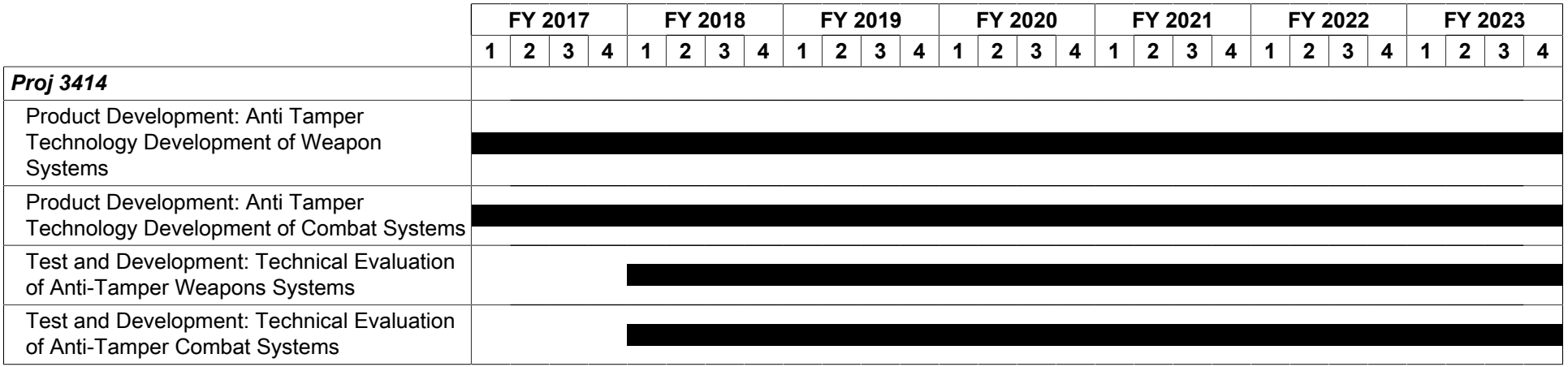


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605024N / *(U)Anti-Tamper Technology Support*	**Project (Number/Name)** 3414 / *Anti-Tamper Technology Support*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3414				
Product Development: Anti Tamper Technology Development of Weapon Systems	1	2017	4	2023
Product Development: Anti Tamper Technology Development of Combat Systems	1	2017	4	2023
Test and Development: Technical Evaluation of Anti-Tamper Weapons Systems	1	2018	4	2023
Test and Development: Technical Evaluation of Anti-Tamper Combat Systems	1	2018	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605212M / *CH-53K*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	0.000	326.945	-	326.945	296.281	193.699	19.933	20.420	Continuing	Continuing
3059: *CH-53K Development*	0.000	0.000	0.000	326.945	-	326.945	296.281	193.699	19.933	20.420	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 390												

Note

Funds increase from FY 2018 to FY 2019 due to transfer of effort from PE 0605212N beginning in FY 2019.

A. Mission Description and Budget Item Justification

The CH-53 is the only marinized heavy-lift helicopter in the world and is the Marine Corps only heavy-lift helicopter. The CH-53 mission is the conduct of expeditionary heavy-lift assault transport of armored vehicles, equipment and personnel to support distributed operations deep inland from a sea-based center of operations. The CH-53E "Super Stallion" was introduced into operations in 1980 as an upgrade version of the CH-53D. The CH-53E has developed performance degradation, fatigue life, interoperability, maintenance supportability, and other operational concerns. An improved CH-53 is needed to support Marine Air-Ground Task Force heavy-lift requirements in the 21st century joint environment. The CH-53K "King Stallion" will provide improvements in range and payload, performance, cargo handling, turn-around times, reliability and maintainability, interoperability, and survivability. The CH-53K program is required to provide full system capability, including shipboard compatibilities, at Initial Operational Capability (IOC).

Total aircraft quantities for the CH-53K program are 205 helicopters. This includes one Ground Test Vehicle (GTV) and four Engineering Development Models (EDMs) for System Development and Demonstration (SDD), to be purchased with Research, Development, Test & Evaluation (RDT&E) funds. Of the remaining 200 aircraft, six will be System Demonstration Test Articles (SDTAs) and will be incrementally funded using RDT&E funds. The SDTAs will be used to prove out production and integration processes on a pilot production line, and to provide aircraft for Initial Operational Test and Evaluation. The remaining 194 aircraft will be Aircraft Procurement, Navy funded.

This is not a New Start program. FY19 and beyond are realigned from PE 0605212N /CH-53K to this PE 0605212M /CH-53K.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605212M / *CH-53K*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	326.945	-	326.945
Total Adjustments	0.000	0.000	326.945	-	326.945
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	330.321	-	330.321
• Rate/Misc Adjustments	0.000	0.000	-3.376	-	-3.376

Change Summary Explanation

Funds increase from FY 2018 to FY 2019 due to transfer of effort from PE 0605212N beginning in FY 2019.

Technical: Not applicable.
Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605212M / *CH-53K*				Project (Number/Name) 3059 / *CH-53K Development*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3059: *CH-53K Development*	0.000	0.000	0.000	326.945	-	326.945	296.281	193.699	19.933	20.420	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 390

Note

This is not a New Start program. Funding was realigned from PE 0605212N /CH-53K to this PE 0605212M /CH-53K.

A. Mission Description and Budget Item Justification

The CH-53 is the only marinized heavy-lift helicopter in the world and is the Marine Corps only heavy-lift helicopter. The CH-53 mission is the conduct of expeditionary heavy-lift assault transport of armored vehicles, equipment and personnel to support distributed operations deep inland from a sea-based center of operations. The CH-53E "Super Stallion" was introduced into operations in 1980 as an upgrade version of the CH-53D. The CH-53E has developed performance degradation, fatigue life, interoperability, maintenance supportability, and other operational concerns. An improved CH-53 is needed to support Marine Air-Ground Task Force heavy-lift requirements in the 21st century joint environment. The CH-53K "King Stallion" will provide improvements in range and payload, performance, cargo handling, turn-around times, reliability and maintainability, interoperability, and survivability. The CH-53K program is required to provide full system capability, including shipboard compatibilities, at Initial Operational Capability (IOC).

Total aircraft quantities for the CH-53K program are 205 helicopters. This includes one Ground Test Vehicle (GTV) and four Engineering Development Models (EDMs) for System Development and Demonstration (SDD), to be purchased with Research, Development, Test & Evaluation (RDT&E) funds. Of the remaining 200 aircraft, six will be System Demonstration Test Articles (SDTAs) and will be incrementally funded using RDT&E funds. The SDTAs will be used to prove out production and integration processes on a pilot production line, and to provide aircraft for Initial Operational Test and Evaluation. SDTAs are shown in the year of contract award vice year of delivery. The remaining 194 aircraft will be Aircraft Procurement, Navy funded.

This is not a New Start program. Funding was realigned from PE 0605212N /CH-53K to this PE 0605212M /CH-53K.
FY19 RDT&E funds CH-53K SDD activities to include additional ground and flight test of one GTV, four EDMs and four SDTAs, associated subsystems and components, and the continued fabrication and assembly of the remaining two SDTA aircraft.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Title: Air Vehicle Development	0.000	0.000	272.161	0.000	272.161
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212M / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Additional ground and flight test of the CH-53K GTV, EDMs and their associated subsystems and components in preparation and commencement of IOT&E. Continue to evaluate and implement producability, reliability and capability improvements during fabrication and assembly of System Demonstration Test Articles (SDTA) 5-6. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY 2018 0605212N to FY 2019 0605212M includes additional ground and flight test of the CH-53K GTV, EDMs and their associated subsystems and components in preparation and commencement of IOT&E. Continue to evaluate and implement producability, reliability and capability improvements during fabrication and assembly of System Demonstration Test Articles (SDTA) 5-6.					
Title: Integrated Logistics Support and Test & Evaluation (T&E) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Continue to perform in-house, field activity and contractor support of Integrated Logistic Support and Developmental Test program. Continue to refine and validate Product Support Packages in preparation and commencement of IOT&E, as well as Supportability Test Plans. Continue component qualification, Government ground and flight test activities, as well as LFT&E efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 2018 0605212N to FY 2019 0605212M includes reduced Development Support, Developmental Test & Evaluation, and CSS Support as the development and integration efforts are ramping down.	0.000 -	0.000 -	37.827 -	0.000 -	37.827 -
Title: Systems Engineering & Project Management ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:***	0.000 -	0.000 -	16.957 -	0.000 -	16.957 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212M / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue to perform in-house, field activity and contractor support of test program Integrated Product Teams as development and integration efforts are ramping down. Continue to monitor and plan for Correction of Deficiencies identified during component qualification and flight test. Efforts include engineering, program management and test program travel. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 2018 0605212N to FY 2019 0605212M includes reduced Engineering, Program Management, and CSS Support as development and integration efforts are ramping down.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	326.945	0.000	326.945

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN / 0158 / 0158C: *CH-53K (Heavy Lift)*	416.484	714.651	1,274.883	-	1,274.883	1,375.696	1,888.964	2,263.281	2,287.373	13,246.549	23,509.181
• APN / 0605: *CH-53K - Initial Spares*	68.408	41.656	59.040	-	59.040	114.611	100.920	16.803	17.144	Continuing	Continuing
• APN / 0528: *H-53 Series*	0.000	0.000	19.032	-	19.032	31.446	21.407	27.799	36.326	27.083	163.093

Remarks

APN/0158/0158C: CH-53K Advanced and Regular Procurement (APN-1)
APN/0605: CH-53K Spares (APN-6)
APN/0528: CH-53K OSIP #s 007-19 Correction of Deficiencies and 008-19 Production Upgrades

D. Acquisition Strategy

On 31 October 2005, the Defense Acquisition Board (DAB) reviewed the CH-53K program for a Milestone (MS) B decision on entry to Systems Design and Development (SDD). The Under Secretary of the Defense for Acquisition, Technology and Logistics (USD AT&L) signed the Acquisition Decision Memorandum (ADM) allowing the program to proceed with SDD on 22 December 2005. The CH-53K program was initiated as an Acquisition Category 1D program, based on total estimated costs for Research, Development, Test and Evaluation and Aircraft Procurement, Navy. The SDD prime contract was awarded sole-source contract to Sikorsky Aircraft Corporation on 5 April, 2006, following the MS B decision. SDD efforts will develop and document technology maturations, selections, and integration into CH-53E design modifications for a new CH-53K variant; produce one CH-53K Ground Test Vehicle and four CH-53K Engineering Developmental Models; and conduct and support Test and Evaluation activities fulfilling milestone exit criteria. In FY13 the SDD contract was modified to include four System Demonstration Test Articles

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212M / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

(SDTAs). In FY15 the SDD contract was modified to add the long-lead/critical parts for the two additional SDTA aircraft. The T408-GE-400 engines for SDTAs 1-4, which were converted from Contractor Furnished Equipment to Government Furnished Equipment, were placed on contract in FY14. Additionally, a contract option was exercised in FY15 to provide engines for SDTAs 5-6. On 30 March 2017, the DAB reviewed the CH-53K program for a MS C decision allowing entry into Production and the ADM was signed by USD AT&L on 4 April 2017.

E. Performance Metrics

Since MS B, the program team has followed a disciplined, event-driven, design and development process. The program completed Preliminary Design Review in September 2008 and conducted Critical Design Review in July 2010. System meets or exceeds all Key Performance Parameters.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212M / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development: SDD / SDTA Air Vehicle	SS/CPIF	Sikorsky : Stratford, CT	0.000	0.000		0.000		267.921	Dec 2018	-		267.921	477.825	745.746	749.656
Ancillary Hardware Development: DECM	SS/CPFF	Northrup Grumman : Falls Church, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
GFE: Various	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
GFE: Engines	SS/CPFF	GE : Lynn, MA	0.000	0.000		0.000		1.150	Jan 2019	-		1.150	0.000	1.150	1.150
Incentive Fees	SS/CPIF	Sikorsky : Stratford, CT	0.000	0.000		0.000		3.090	Jan 2019	-		3.090	6.929	10.019	10.019
RAA: JUONS-S0-0010 (DAIRCM)	TBD	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Prior year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		272.161		-		272.161	484.754	756.915	N/A

Remarks

Primary Hardware Development Target Value of Contract includes System Demonstration Test Articles (SDTAs).
Ancillary Hardware Development provides funding for Defensive Electronic Countermeasures (DECM) contract.
Government Furnished Equipment/Engines provides funding for SDTA engine contract.
FY17-19 Incentive Fees are a contractual requirement as potential schedule incentives based on continued progress of the SDTA aircraft.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		1.150	Dec 2018	-		1.150	0.750	1.900	-
Integrated Logistics Support	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		1.200	Dec 2018	-		1.200	2.129	3.329	-
Integrated Logistics Support	WR	NADEP : Cherry Point, NC	0.000	0.000		0.000		1.325	Dec 2018	-		1.325	1.261	2.586	-
Integrated Logistics Support	C/CPFF	GDIT : Fairfax, VA	0.000	0.000		0.000		1.578	Apr 2019	-		1.578	2.522	4.100	4.100

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212M / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	Various : Various	0.000	0.000		0.000		1.655	Dec 2018	-		1.655	1.977	3.632	-
Government Engineering Support	WR	NAWCTSD : Orlando, FL	0.000	0.000		0.000		1.523	Dec 2018	-		1.523	0.877	2.400	-
Studies & Analyses	WR	NSWC : Crane, IN	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Studies & Analyses	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		8.431		-		8.431	9.516	17.947	N/A

Remarks

NAWC TSD training systems previously captured under "Integrated Logistic Support - Various" are now contained in the Government Engineering support line.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	Various : Various	0.000	0.000		0.000		1.475	Dec 2018	-		1.475	2.094	3.569	-
Developmental Test & Evaluation	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		22.894	Dec 2018	-		22.894	15.682	38.576	-
Operational Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.000		0.000		1.877	Dec 2018	-		1.877	6.060	7.937	-
Live Fire Test & Evaluation	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		3.150	Dec 2018	-		3.150	1.350	4.500	-
		Subtotal	0.000	0.000		0.000		29.396		-		29.396	25.186	54.582	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	0.000	0.000		0.000		2.848	Dec 2018	-		2.848	3.452	6.300	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212M / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		10.958	Dec 2018	-		10.958	2.232	13.190	-
Program Management Support	C/CPFF	Camber : Huntsville, AL	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Program Management Support	C/CPFF	Zenetix : Herndon, VA	0.000	0.000		0.000		2.208	Jan 2019	-		2.208	3.110	5.318	5.318
Program Management Support	Various	Various : Various	0.000	0.000		0.000		0.833	Dec 2018	-		0.833	1.793	2.626	-
Travel	WR	NAWCAD : Pax River, MD	0.000	0.000		0.000		0.110	Dec 2018	-		0.110	0.290	0.400	-
Prior year Mgmt cost no longer funded in the FYDP	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		16.957		-		16.957	10.877	27.834	N/A

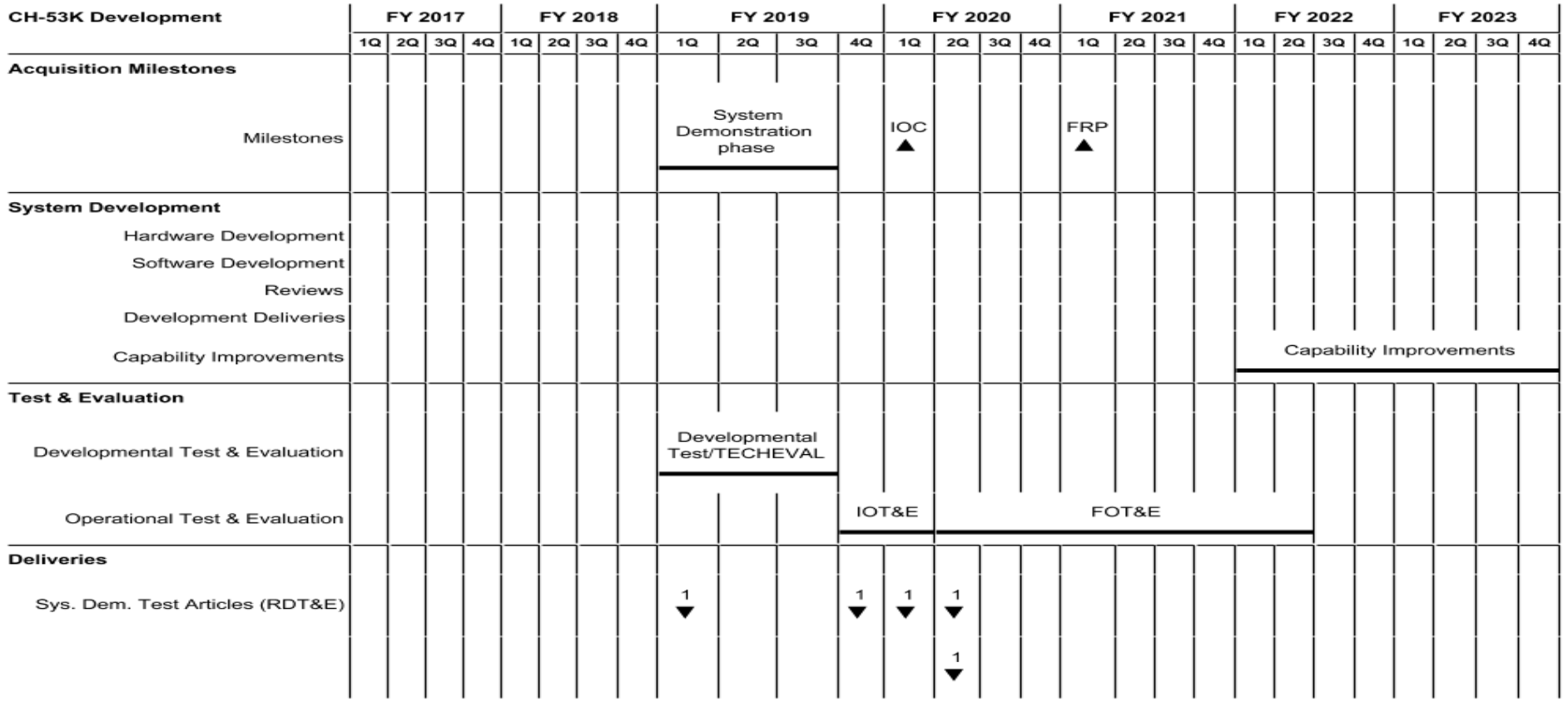
Remarks

Management Services requirements continue to decrease FY17-19 as both Government and Contractor support transitions to the CH-53K Production program.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		326.945		-		326.945	530.333	857.278	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212M / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*



2019PB - 0605212M - 3059

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212M / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CH-53K Development				
Acquisition Milestones: Milestones: System Demonstration phase	1	2019	3	2019
Acquisition Milestones: Milestones: Initial Operational Capability	1	2020	1	2020
Acquisition Milestones: Milestones: Full Rate Production	1	2021	1	2021
System Development: Capability Improvements: Capability Improvements	1	2022	4	2023
Test & Evaluation: Developmental Test & Evaluation: Developmental Test / TECHEVAL	1	2019	3	2019
Test & Evaluation: Operational Test & Evaluation: IOT&E	4	2019	1	2020
Test & Evaluation: Operational Test & Evaluation: FOT&E	2	2020	2	2022
Deliveries: Sys. Dem. Test Articles (RDT&E): System Demonstration Test Articles (SDTA) #2	1	2019	1	2019
Deliveries: Sys. Dem. Test Articles (RDT&E): System Demonstration Test Articles (SDTA) #3	4	2019	4	2019
Deliveries: Sys. Dem. Test Articles (RDT&E): System Demonstration Test Articles (SDTA) #4	2	2020	2	2020
Deliveries: Sys. Dem. Test Articles (RDT&E): System Demonstration Test Articles (SDTA) #5	1	2020	1	2020
Deliveries: Sys. Dem. Test Articles (RDT&E): System Demonstration Test Articles (SDTA) #6	2	2020	2	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605212N / *CH-53K*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	5,375.468	339.101	340.758	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6,055.327
3059: *CH-53K Development*	5,375.468	339.101	340.758	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6,055.327
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 390												

Note

Funds decrease from FY 2018 to FY 2019 due to transfer of effort to new PE 0605212N beginning in FY 2019.

A. Mission Description and Budget Item Justification

The CH-53 is the only marinized heavy-lift helicopter in the world and is the Marine Corps only heavy-lift helicopter. The CH-53 mission is the conduct of expeditionary heavy-lift assault transport of armored vehicles, equipment and personnel to support distributed operations deep inland from a sea-based center of operations. The CH-53E "Super Stallion" was introduced into operations in 1980 as an upgrade version of the CH-53D. The CH-53E has developed performance degradation, fatigue life, interoperability, maintenance supportability, and other operational concerns. An improved CH-53 is needed to support Marine Air-Ground Task Force heavy-lift requirements in the 21st century joint environment. The CH-53K "King Stallion" will provide improvements in range and payload, performance, cargo handling, turn-around times, reliability and maintainability, interoperability, and survivability. The CH-53K program is required to provide full system capability, including shipboard compatibilities, at Initial Operational Capability (IOC).

Total aircraft quantities for the CH-53K program are 205 helicopters. This includes one Ground Test Vehicle (GTV) and four Engineering Development Models (EDMs) for System Development and Demonstration (SDD), to be purchased with Research, Development, Test & Evaluation (RDT&E) funds. Of the remaining 200 aircraft, six will be System Demonstration Test Articles (SDTAs) and will be incrementally funded using RDT&E funds. The SDTAs will be used to prove out production and integration processes on a pilot production line, and to provide aircraft for Initial Operational Test and Evaluation. The remaining 194 aircraft will be Aircraft Procurement, Navy funded.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605212N / *CH-53K*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	404.810	340.758	330.755	-	330.755
Current President's Budget	339.101	340.758	0.000	-	0.000
Total Adjustments	-65.709	0.000	-330.755	-	-330.755
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-11.707	0.000			
• Program Adjustments	0.000	0.000	-330.321	-	-330.321
• Rate/Misc Adjustments	0.000	0.000	-0.434	-	-0.434
• Congressional General Reductions Adjustments	-0.002	-	-	-	-
• Congressional Directed Reductions Adjustments	-54.000	-	-	-	-

Change Summary Explanation

Funds decrease from FY 2018 to FY 2019 due to transfer of effort to new PE 0605212N beginning in FY 2019.

Technical: N/A

Schedule: N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605212N / *CH-53K*				Project (Number/Name) 3059 / *CH-53K Development*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3059: *CH-53K Development*	5,375.468	339.101	340.758	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6,055.327
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 390

Note

FY19 and beyond are realigned under PE 0605212M / CH-53K. FY18 ends efforts under this PE 0605212N.

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Title: Air Vehicle Development	249.417	271.876	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Continue ground and flight test of the CH-53K GTV, EDMs and their associated subsystems and components. Continue to evaluate and implement producability, reliability and capability improvements during fabrication and assembly of System Demonstration Test Articles (SDTA) 4-6. Delivery of Ancillary Defensive Electronic Countermeasures (DECM) hardware and software to Prime Contractor for integration.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212N / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY19 and beyond are realigned under PE 0605212M / CH-53K. FY18 ends efforts under this PE 0605212N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 and beyond are realigned under PE 0605212M / CH-53K. FY18 ends efforts under this PE 0605212N.					
Title: Integrated Logistics Support and Test & Evaluation (T&E) ***Articles:*** ***FY 2018 Plans:*** Perform in-house, field activity and contractor support of Integrated Logistic support. Continue to refine and validate Product Support Packages in preparation for IOT&E, as well as Supportability Test Plans. Continue component qualification, Government ground and flight test activities, as well as begin LFT&E efforts on the GTV. ***FY 2019 Base Plans:*** FY19 and beyond are realigned under PE 0605212M / CH-53K. FY18 ends efforts under this PE 0605212N. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 and beyond are realigned under PE 0605212M / CH-53K. FY18 ends efforts under this PE 0605212N.	56.653 -	43.971 -	0.000 -	0.000 -	0.000 -
Title: Systems Engineering & Project Management ***Articles:*** ***FY 2018 Plans:*** Continue to perform in-house, field activity and contractor support of test program Integrated Product Teams as workforce continues to transition to the CH-53K production program. Monitor and plan for Correction of Deficiencies identified during component qualification and flight test. Efforts include engineering, program management and test program travel. ***FY 2019 Base Plans:*** FY19 and beyond are realigned under PE 0605212M / CH-53K. FY18 ends efforts under this PE 0605212N. ***FY 2019 OCO Plans:***	33.031 -	24.911 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212N / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 and beyond are realigned under PE 0605212M / CH-53K. FY18 ends efforts under this PE 0605212N.					
Accomplishments/Planned Programs Subtotals	339.101	340.758	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN / 0158 / 0158C: *CH-53K (Heavy Lift)*	416.484	714.651	1,274.883	-	1,274.883	1,375.696	1,888.964	2,263.281	2,287.373	13,621.794	23,884.426
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Remarks

APN/0158/0158C: CH-53K Advanced and Regular Procurement (APN-1)
APN/0605: CH-53K Spares (APN-6)
APN/0528: CH-53K OSIP #s 007-19 Correction of Deficiencies and 008-19 Production Upgrades

D. Acquisition Strategy

On 31 October 2005, the Defense Acquisition Board (DAB) reviewed the CH-53K program for a Milestone (MS) B decision on entry to Systems Design and Development (SDD). The Under Secretary of the Defense for Acquisition, Technology and Logistics (USD AT&L) signed the Acquisition Decision Memorandum (ADM) allowing the program to proceed with SDD on 22 December 2005. The CH-53K program was initiated as an Acquisition Category 1D program, based on total estimated costs for Research, Development, Test and Evaluation and Aircraft Procurement, Navy. The SDD prime contract was awarded sole-source contract to Sikorsky Aircraft Corporation on 5 April, 2006, following the MS B decision. SDD efforts will develop and document technology maturations, selections, and integration into CH-53E design modifications for a new CH-53K variant; produce one CH-53K Ground Test Vehicle and four CH-53K Engineering Developmental Models; and conduct and support Test and Evaluation activities fulfilling milestone exit criteria. In FY13 the SDD contract was modified to include four System Demonstration Test Articles (SDTAs). In FY15 the SDD contract was modified to add the long-lead/critical parts for the two additional SDTA aircraft. The T408-GE-400 engines for SDTAs 1-4, which were converted from Contractor Furnished Equipment to Government Furnished Equipment, were placed on contract in FY14. Additionally, a contract option was exercised in FY15 to provide engines for SDTAs 5-6. On 30 March 2017, the DAB reviewed the CH-53K program for a MS C decision allowing entry into Production and the ADM was signed by USD AT&L on 4 April 2017.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212N / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

E. Performance Metrics

Since MS B, the program team has followed a disciplined, event-driven, design and development process. The program completed Preliminary Design Review in September 2008 and conducted Critical Design Review in July 2010. System meets or exceeds all Key Performance Parameters.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212N / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development: SDD / SDTA Air Vehicle	SS/CPIF	Sikorsky : Stratford, CT	4,257.238	199.948	Dec 2016	252.568	Dec 2017	0.000		-		0.000	0.000	4,709.754	4,709.754
Ancillary Hardware Development: DECM	SS/CPFF	Northrup Grumman : Falls Church, VA	17.789	8.572	Jan 2017	7.679	Jan 2018	0.000		-		0.000	0.000	34.040	34.040
GFE: Various	Various	Various : Various	64.262	1.955	Dec 2016	1.200	Dec 2017	0.000		-		0.000	0.000	67.417	-
GFE: Engines	SS/CPFF	GE : Lynn, MA	102.108	27.553	Jan 2017	7.000	Jan 2018	0.000		-		0.000	0.000	136.661	136.661
Incentive Fees	SS/CPIF	Sikorsky : Stratford, CT	95.132	11.389	Dec 2016	3.429	Jan 2018	0.000		-		0.000	0.000	109.950	109.950
RAA: JUONS-S0-0010 (DAIRCM)	TBD	Various : Various	53.000	0.000		0.000		0.000		-		0.000	0.000	53.000	53.000
Prior year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	73.400	0.000		0.000		0.000		-		0.000	0.000	73.400	-
		Subtotal	4,662.929	249.417		271.876		0.000		-		0.000	0.000	5,184.222	N/A

Remarks

Primary Hardware Development Target Value of Contract includes System Demonstration Test Articles (SDTAs).
Ancillary Hardware Development provides funding for Defensive Electronic Countermeasures (DECM) contract.
Government Furnished Equipment/Engines provides funding for SDTA engine contract.
FY17-19 Incentive Fees are a contractual requirement as potential schedule incentives based on continued progress of the SDTA aircraft.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	NAWCAD : Lakehurst, NJ	7.729	1.519	Dec 2016	1.360	Dec 2017	0.000		-		0.000	0.000	10.608	-
Integrated Logistics Support	WR	NAWCAD : Lakehurst, NJ	20.194	3.428	Dec 2016	1.200	Dec 2017	0.000		-		0.000	0.000	24.822	-
Integrated Logistics Support	WR	NADEP : Cherry Point, NC	16.059	3.057	Dec 2016	1.458	Dec 2017	0.000		-		0.000	0.000	20.574	-
Integrated Logistics Support	C/CPFF	GDIT : Fairfax, VA	17.767	2.906	Apr 2017	1.960	Apr 2018	0.000		-		0.000	0.000	22.633	22.633

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605212N / *CH-53K*	Project (Number/Name) 3059 / *CH-53K Development*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	Various : Various	37.345	2.075	Dec 2016	1.792	Dec 2017	0.000		-		0.000	0.000	41.212	-
Government Engineering Support	WR	NAWCTSD : Orlando, FL	5.937	3.386	Dec 2016	2.257	Dec 2017	0.000		-		0.000	0.000	11.580	-
Studies & Analyses	WR	NSWC : Crane, IN	3.500	0.000		0.000		0.000		-		0.000	0.000	3.500	-
Studies & Analyses	Various	Various : Various	22.127	0.000		0.000		0.000		-		0.000	0.000	22.127	-
		Subtotal	130.658	16.371		10.027		0.000		-		0.000	0.000	157.056	N/A

Remarks

NAWC TSD training systems previously captured under "Integrated Logistic Support - Various" are now contained in the Government Engineering support line.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	Various : Various	26.634	4.250	Dec 2016	1.500	Dec 2017	0.000		-		0.000	0.000	32.384	-
Developmental Test & Evaluation	WR	NAWCAD : Pax River, MD	67.905	31.443	Dec 2016	27.945	Dec 2017	0.000		-		0.000	0.000	127.293	-
Operational Test & Evaluation	WR	COMPTEVFOR : Norfolk, VA	3.670	1.157	Dec 2016	1.099	Dec 2017	0.000		-		0.000	0.000	5.926	-
Live Fire Test & Evaluation	WR	NAWCWD : China Lake, CA	13.008	3.432	Dec 2016	3.400	Dec 2017	0.000		-		0.000	0.000	19.840	-
		Subtotal	111.217	40.282		33.944		0.000		-		0.000	0.000	185.443	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	25.730	4.197	Dec 2016	3.500	Dec 2017	0.000		-		0.000	0.000	33.427	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605212N / *CH-53K*	Project (Number/Name) 3059 / *CH-53K Development*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering Support	WR	NAWCAD : Pax River, MD	324.068	23.054	Dec 2016	17.542	Dec 2017	0.000		-		0.000	0.000	364.664	-
Program Management Support	C/CPFF	Camber : Huntsville, AL	41.708	0.000		0.000		0.000		-		0.000	0.000	41.708	41.708
Program Management Support	C/CPFF	Zenetix : Herndon, VA	12.278	4.451	Jan 2017	2.744	Jan 2018	0.000		-		0.000	0.000	19.473	19.473
Program Management Support	Various	Various : Various	60.962	1.129	Dec 2016	1.000	Dec 2017	0.000		-		0.000	0.000	63.091	-
Travel	WR	NAWCAD : Pax River, MD	3.968	0.200	Dec 2016	0.125	Dec 2017	0.000		-		0.000	0.000	4.293	-
Prior year Mgmt cost no longer funded in the FYDP	Various	Various : Various	1.950	0.000		0.000		0.000		-		0.000	0.000	1.950	-
		Subtotal	470.664	33.031		24.911		0.000		-		0.000	0.000	528.606	N/A

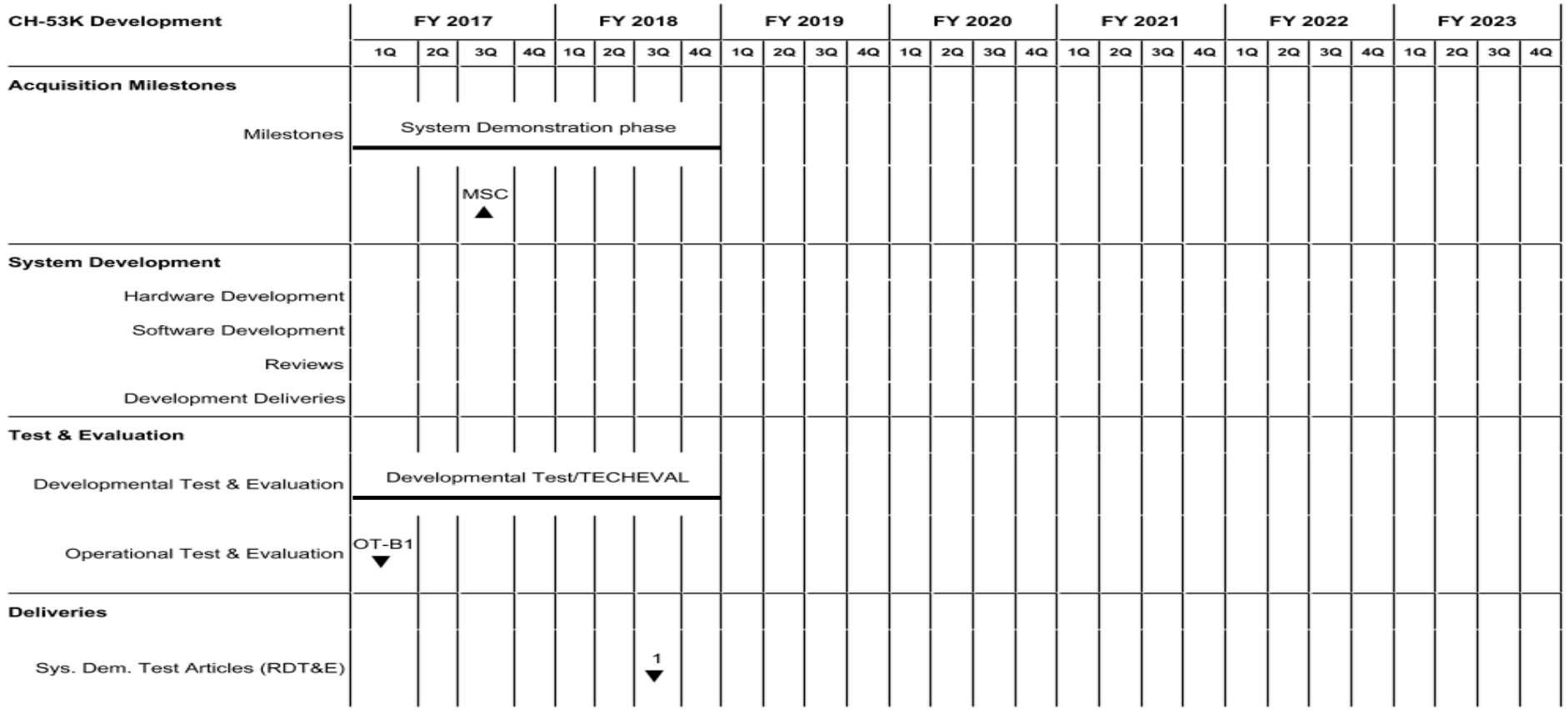
Remarks

Management Services requirements continue to decrease FY17-19 as both Government and Contractor support transitions to the CH-53K Production program.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5,375.468	339.101		340.758		0.000		-		0.000	0.000	6,055.327	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212N / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*



2019PB - 0605212N - 3059

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605212N / *CH-53K*	**Project (Number/Name)** 3059 / *CH-53K Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CH-53K Development				
Acquisition Milestones: Milestones: System Demonstration phase	1	2017	4	2018
Acquisition Milestones: Milestones: Milestone C	3	2017	3	2017
Test & Evaluation: Developmental Test & Evaluation: Developmental Test / TECHEVAL	1	2017	4	2018
Test & Evaluation: Operational Test & Evaluation: OT-B1	1	2017	1	2017
Deliveries: Sys. Dem. Test Articles (RDT&E): System Demonstration Test Articles (SDTA) #1	3	2018	3	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605215N *I (U)Mission Planning*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	32.876	33.430	32.714	-	32.714	42.194	35.634	33.840	34.564	Continuing	Continuing
2213: *Mission Planning*	0.000	21.415	21.580	21.868	-	21.868	30.889	24.155	22.272	22.744	Continuing	Continuing
2311: *Stores Planning and Weaponeering Module*	0.000	10.847	11.185	10.846	-	10.846	11.305	11.479	11.568	11.820	Continuing	Continuing
2312: *Common Helicopters*	0.000	0.614	0.665	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.279

Note

The FY 2019 funding request was reduced by $0.312 million to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

The Mission Planning PE is used to develop automated mission planning systems to support Naval Aviation.

The Joint Mission Planning System (JMPS) is the designated automated mission planning system for the Navy, supporting over 40 Type/Model/Series (T/M/S) of U.S. Navy and Marine Corps aircraft and expeditionary forces. JMPS-M (Maritime) enables weapon system employment by providing the information, automated tools, and decision aids needed to rapidly plan aircraft, weapon, or sensor missions, load mission data into aircraft and weapons, conduct mission rehearsal, execute missions, and conduct post-mission analysis. JMPS-E (Expeditionary) is a scalable, tailorable, and collaborative web-based mission planning and execution monitoring tool for Amphibious Squadron (PHIBRON) staffs embarked with each Amphibious Ready Group (ARG) and Expeditionary Strike Group (ESG). Electronic Kneeboard (EKB) is a mobile device configured with various software applications and features to support aircrew during pre-flight planning, in-flight re-planning and mission execution, and post-mission debriefing and analysis. Common Munitions BIT/Reprogramming Equipment (CMBRE) provides USN/USMC forces the critical capability to preform built-in test and programming/reprogramming of various weapons. FY20 and out includes funding for the research and the development in order to develop upgrades to the CMBRE system to support advanced operational capabilities, address system obsolescence, meet cyber security requirements, and meet mission readiness requirements.

The Stores Planning and Weaponeering Module, also referred to as Weaponeering and Stores Planning (WASP), is an integrated software product that allows aircrew to determine the best combinations of weapons and delivery conditions to achieve the desired level of target damage, eliminate weapon delivery solutions that violate aircraft T/M/S specific safety-of-flight envelopes, and perform detailed weapons employment planning for F/A-18 and E/A-18G aircraft.

Common Helicopters is used to develop unique planning capabilities and tools for helicopters (e.g. Weight and Power Calculators (WPC), Common Mission Data Loader (CMDL), Weapon Employment Zone Overlays Tool (WEZOT) and Point Selection Tool (PST)) for integration into JMPS Mission Planning Environments (MPE). Starting in FY19, Common Helicopters RDT&E funding in PU 2312 is being consolidated with JMPS-M Mission Planning funding in PU 2213.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605215N *I (U)Mission Planning*

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under MISSION PLANNING because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	33.570	33.430	33.570	-	33.570
Current President's Budget	32.876	33.430	32.714	-	32.714
Total Adjustments	-0.694	0.000	-0.856	-	-0.856
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.690	0.000			
• Program Adjustments	0.000	0.000	-0.312	-	-0.312
• Rate/Misc Adjustments	0.000	0.000	-0.544	-	-0.544
• Congressional General Reductions Adjustments	-0.004	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by $0.312 million to account for the availability of prior year execution balances.

Technical: N/A

Schedule:

2213:

Clarified names of Mission Planning Environment (MPE) Integration and Test events and extended framework development period through 4th QTR 2020 to include latest USAF schedules. Changed Increment 4 IOC date to 1st QTR 2020 to align with the program APB. Extended 32-bit MPE integration and test out to 4th QTR 2020 to align with platform needs.

2311:

Due to the incorporation of agile software development into the WASP program, the Systems Development and Test and Evaluation periods for each WASP version are concurrent, thus accelerating IOCs of each version by at least one quarter to meet emerging warfighter requirements within available budget.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605215N *I (U)Mission Planning*

2312:

Common Helicopter efforts are consolidated under PU 2213 Mission Planning FY 2019 and out.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605215N / *(U)Mission Planning*	Project (Number/Name) 2213 / *Mission Planning*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2213: *Mission Planning*	0.000	21.415	21.580	21.868	-	21.868	30.889	24.155	22.272	22.744	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

JMPS-Maritime (JMPS-M) is the designated automated mission planning system for naval aviation, supporting over 40 T/M/S of U.S. Navy and Marine Corps aircraft. JMPS-M enables weapon system employment by providing the information, automated tools, and decision aids needed to rapidly plan aircraft, weapon, or sensor missions, load mission data into aircraft and weapons, conduct mission rehearsal, and conduct post-mission analysis. JMPS-M is a mission critical system which is a co-development effort between the United States Navy (USN) and United States Air Force (USAF). Common requirements are identified and core JMPS-M capabilities are developed and prioritized in an evolutionary approach. An individual JMPS-M Mission Planning Environment (MPE) requires the JMPS framework, common components, unique planning components (UPCs), federated applications, and the necessary system hardware required to satisfy mission planning objectives. Most tactical naval aviation platforms are dependent solely on JMPS-M to plan precision guided munitions, sensor systems, tactical data links, secure voice communications, and basic Safety of Flight functions. Common helicopter functionality will be developed for implementation in Joint Mission Planning System (JMPS). Common Helicopter components include, Weight and Power Calculators (WPC), Common Mission Data Loader (CMDL), Weapon Employment Zone Overlays Tool (WEZOT) and Point Selection Tool (PST).

The JMPS-M Increment 4 release transitions JMPS-M from Windows 7/32-bit Operating System (OS) (JMPS-M Increment 3) to Windows 10/64-bit OS. Transition to 64-bit allows for memory space expansion to accommodate future Microsoft Operating Systems, emerging technologies, and meet critical required cyber security mandates. Increment 4 development requires software conversion and refactoring to address memory limitations and system errors resulting in JMPS-M computer crashes. The transition from the current 32-bit architecture to a 64-bit architecture provides additional memory access, increased planning efficiencies, and creates an increased stability in the architecture resulting in fewer system crashes and improved cyber security. JMPS-M 64-bit transition efforts (Increment 4) also support platform capability enhancements that require increased amounts of data and processing power.

Next Generation Naval Mission Planning will provide a new mission planning system which supports future multi-domain mission planning, execution, management, and mission analysis capabilities required by the 21st century warfighter. Next Generation Naval Mission Planning will modernize system architecture to address technological obsolescence, deliver collaboration and automation capabilities, and leverage service-oriented architecture to provide affordable revolutionary improvements in workflow, usability, cybersecurity, portability of mission planning, mission execution, and mission analysis functions.

FY20 and out includes funding for Common Munitions BIT/Reprogramming Equipment (CMBRE) which provides the USN/USMC the critical capability to perform built-in-test and programming/reprogramming of various weapons. Funding will provide research and the development in order to develop upgrades to the CMBRE system to support advanced operational capabilities, address system obsolescence, meet cyber security requirements, and meet mission readiness requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Joint Mission Planning System Expeditionary (JMPS-E)	0.908	0.946	0.953	0.000	0.953

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2213 / *Mission Planning*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Articles:	-	-	-	-	-
Description: JMPS Expeditionary (JMPS-E): JMPS-E provides a scalable, tailorable, mission planning and execution monitoring tool for Amphibious Squadron staffs. The primary focus of this system is to provide an automated capability to assist planners with mission analysis, course of action development and automated creation of doctrinal orders based on planning data in the system. JMPS-E provides a digital map enabling better response times to changing plans, easier distribution of planning artifacts and a reduction in human error during the planning process. The variety and geographically separated nature of forces involved with Ship to Objective Maneuver (STOM) amplifies the need for web-based technologies to enable collaborative planning, improve overall situational awareness and enable the monitoring of mission execution from different locations. The primary outputs are tasking orders, route plans, battlespace geometries and decision briefs. The system will also incorporate modeling and simulation tools to rehearse and deconflict mission plans. ***FY 2018 Plans:*** Continue integration and testing of JMPS-E MPE Version 3.0. ***FY 2019 Base Plans:*** Field JMPS-E MPE Version 3.0. Begin development, integration and testing of JMPS-E MPE Version 3.1 which updates the JMPS-E UPC and required Common Components, Federated Applications, COTS and GOTS software products to maintain current capabilities and required cyber posture. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.007M from FY 2018 to FY 2019 due to additional efforts required to support fielding and development of multiple JMPS-E versions (3.0 and 3.1).					
Title: Mission Planning Environment Program Mgmt, Integration, and Test	11.107	12.744	12.687	0.000	12.687
Articles:	-	-	-	-	-
Description: Mission Planning Environment (MPE) Integration and Test efforts support the Navy's developmental testing/operational testing, integration and system of system testing for MPE fielding, integrating, testing, and managing Electronic Kneeboard (EKB) efforts. Life-cycle management efforts consist of integration of components provided by various developers into a platform-centric MPE and testing of the integrated MPE. MPE integration and testing results in a consistent and repeatable system configuration that enables stability and reliability.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2213 / *Mission Planning*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continue integration and testing, project management and systems engineering for current MPEs. Continue integration for three new variants of the C/KC-130J, wireless JMPS, and EKB efforts. These wireless efforts will require additional testing and integration to meet cyber mandates. Continue supporting future releases of JMPS and Electronic Kneeboard (EKB) software to the fleet. Begin Next Generation Naval Mission Planning requirement analysis. ***FY 2019 Base Plans:*** Continue mission planning integration and testing, project management and system engineering for over 40 T/M/S to include fielding of Windows 10. Test and verify capabilities to support multi-ship mission coordination and update/validate fleet requirements in support of Next Generation Naval Mission Planning MPEs. Conduct integration and test of EKB to the fleet for functionality and cyber security mandates. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.057M from FY 2018 to FY 2019 due to reduced MPE integration and test efforts.					
Title: JMPS Framework (FW) and Common Components (CC) Development	9.400	7.890	8.228	0.000	8.228
Articles:	-	-	-	-	-
Description: Continue development and integration of JMPS 64-bit FW which provide additional capabilities for all naval aircraft to include airdrop, air refueling, and enhanced installations. Common component development include Common Mission Data Loader (CMDL), Weapon Employment Zone Overlays Tool (WEZOT) and Point Selection Tool (PST). FW support tasks include: system engineering processes, management interface controls, software architectural analysis, requirements management and a centralized website for Mission Planning Environment (MPE) developers. As platform(s) requirements emerge for new and enhanced mission planning capabilities, the demand for more complex integrated applications and software products increases. The transition to a 64-bit architecture provides the volume of integrated mission planning capability required by complex integrated combat operations. Common Components software updates augment core mission planning capabilities across multiple T/M/S. The JMPS FW and Common Components will also transition to Windows 10. ***FY 2018 Plans:*** Continue the Increment-4 JMPS Framework Core 64-bit development transition activities. Major activities include completing the 64-bit development and continuation of transitioning Windows 10 operating system					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2213 / *Mission Planning*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
used by multiple platforms. The transition of the JMPS Common Components are aligned to meet platform(s) requirements for new and enhanced mission planning capability in a 64-bit environment. The 64-bit transition is required to address system memory requirements for fielded Mission Planning Environments (MPEs); thus reducing system crashes while improving mission planning performance for the fleet. All Common Components software updates across multiple T/M/S will be completed to support Increment 4. Integration activities will continue as platforms deliver their 64-bit Unique Planning Capabilities to NavMPS for integration, testing and fielding. ***FY 2019 Base Plans:*** Continue development and initiate the fielding of JMPS-M Increment 4 to include co-development with the Air Force for 64 bit Frameworks. This effort will result in Increment 4 being aligned with the Air Force for improved joint service affordability while also enhancing the systems cyber security. Continue development activities for NGNMPS framework which include implementing a modular, scalable architecture to support cyber security implementations for compliance with cyber mandates. Continue development and integration of common components to meet platform(s) requirements for new and enhanced mission planning capability required in a 64-bit environment. Integration activities will continue as platforms deliver their 64-bit Unique Planning Capabilities for integration, testing and fielding. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.338M from FY 2018 to FY 2019 due to additional efforts required to initially field Increment 4 and the consolidation of Common Helicopter PU into this Mission Planning PU.					
Accomplishments/Planned Programs Subtotals	21.415	21.580	21.868	0.000	21.868

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The initial Joint Mission Planning System (JMPS) development effort was a phased evolutionary approach. JMPS is a post Milestone III program and Initial Operational Capability (IOC) occurred in December 2005. Cost Plus Award Fee (CPAF) and Cost Plus Incentive Fee (CPIF) contracts were awarded during initial development. During the down-select process, one contractor was selected to develop the JMPS architecture work and Version 1.0 basic flight planning components. Additional phases focused on strike planning requirements (i.e., support Precision Guided Missions and other tactical data intensive missions) in order to migrate platforms from

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2213 / *Mission Planning*

legacy mission planning systems to JMPS. The USAF and USN continued the joint development of JMPS Frameworks via the USAF Mission Planning Enterprise Contract, which is used for JMPS Framework software development. The USN integration and fielding strategy supports a Mission Planning Environment (MPE) focus, where the JMPS Framework and other software components are integrated, tested, and fielded by T/M/S. As platforms plan their migration to newer versions of JMPS, the acquisition strategy, plan, and program baseline will be updated in order to divest legacy mission planning systems, meet the evolving requirements for integrated mission planning, and lower total life cycle cost. JMPS End of Life (EOF) is scheduled for 2027. This necessitates the development of a replacement system, Next Generation Naval Mission Planning System (NGNMPS). NGNMPS will provide a new mission planning system which supports future multi-domain mission planning, execution, management, and mission analysis capabilities required by the 21st century warfighter. NGNMPS will modernize system architecture to address technological obsolescence, deliver collaboration and automation capabilities, and leverage service-oriented architecture to provide affordable revolutionary improvements in workflow, usability, cybersecurity, portability of mission planning, mission execution, and mission analysis functions. NGNMPS requirements and acquisition documentation development will start in 2018.

E. Performance Metrics

Average time to plan a flight: Threshold value is < 1 hour average time to plan a flight that includes a Military Training Route (MTR), routing to and from the MTR, kneeboard card production, Instrument Flight Rules (IFR) flight planning materials and a Data Transfer Device (DTD) Load. Objective value is < 30 minutes average time to plan a flight that includes a MTR, routing to and from the MTR, kneeboard card production, IFR flight planning materials and a DTD Load.

Interoperability: Threshold value is 100% of top level Interoperability Exchange Requirements (IERs) designated critical will be satisfied. Objective value is 100% of top level IERs will be satisfied.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2213 / *Mission Planning*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Software Development/JMPS Expeditionary	C/CPFF	Leidos : Reston, VA	0.000	0.400	Feb 2017	0.650	Feb 2018	0.665	Feb 2019	-		0.665	Continuing	Continuing	Continuing
Primary Software Development, FW	C/CPFF	Northrop Grumman : Long Beach, CA	0.000	4.500	Feb 2017	1.500	Feb 2018	1.500	Feb 2019	-		1.500	Continuing	Continuing	Continuing
Primary Software Development/(Human Factors)	C/CPFF	Georgia Technical Research Institute (GTRI) : Atlanta, GA	0.000	1.500	Mar 2017	1.000	Mar 2018	1.000	Mar 2019	-		1.000	Continuing	Continuing	Continuing
Primary Software Development	C/CPFF	TBD : TBD	0.000	0.000		2.890	Mar 2018	3.000	Mar 2019	-		3.000	Continuing	Continuing	Continuing
Primary Software Development (SEIC)	C/CPFF	Leidos : Orlando, FL	0.000	2.918	Feb 2017	2.500	Feb 2018	2.728	Feb 2019	-		2.728	Continuing	Continuing	Continuing
		Subtotal	0.000	9.318		8.540		8.893		-		8.893	Continuing	Continuing	N/A

Remarks

FY19 continues to support incremental funding for the Primary Software Development Framework (FW) efforts awarded via a competitive 2nd Qtr. FY18 contract award. The performing activity and location are currently TBD to support a competitive contracting strategy. Once awarded, the performing activity and location will be updated to reflect the selected contractor.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCWD : Point Mugu, CA	0.000	0.208	Nov 2016	0.212	Nov 2017	0.216	Nov 2018	-		0.216	Continuing	Continuing	Continuing
Systems Eng & Integration	WR	NAWCWD : Point Mugu, CA	0.000	2.487	Nov 2016	2.324	Nov 2017	2.320	Nov 2018	-		2.320	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	1.136	Nov 2016	1.300	Nov 2017	1.326	Nov 2018	-		1.326	Continuing	Continuing	Continuing
		Subtotal	0.000	3.831		3.836		3.862		-		3.862	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605215N / *(U)Mission Planning*	Project (Number/Name) 2213 / *Mission Planning*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NAWCWD : Point Mugu, CA	0.000	5.311	Nov 2016	5.579	Nov 2017	5.343	Nov 2018	-		5.343	Continuing	Continuing	Continuing
Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.000	1.046	Jan 2017	1.350	Jan 2018	1.377	Jan 2019	-		1.377	Continuing	Continuing	Continuing
		Subtotal	0.000	6.357		6.929		6.720		-		6.720	Continuing	Continuing	N/A

Remarks

The increase in FY18 COMOPTEVFOR Operational Test (OT) support is due to increased testing for new platforms transitioning to JMPS, increased testing requirements required for new cyber requirements, and additional testing required for the incorporation of new wireless technologies for multiple JMPS platforms

Management Services ($ in Millions)

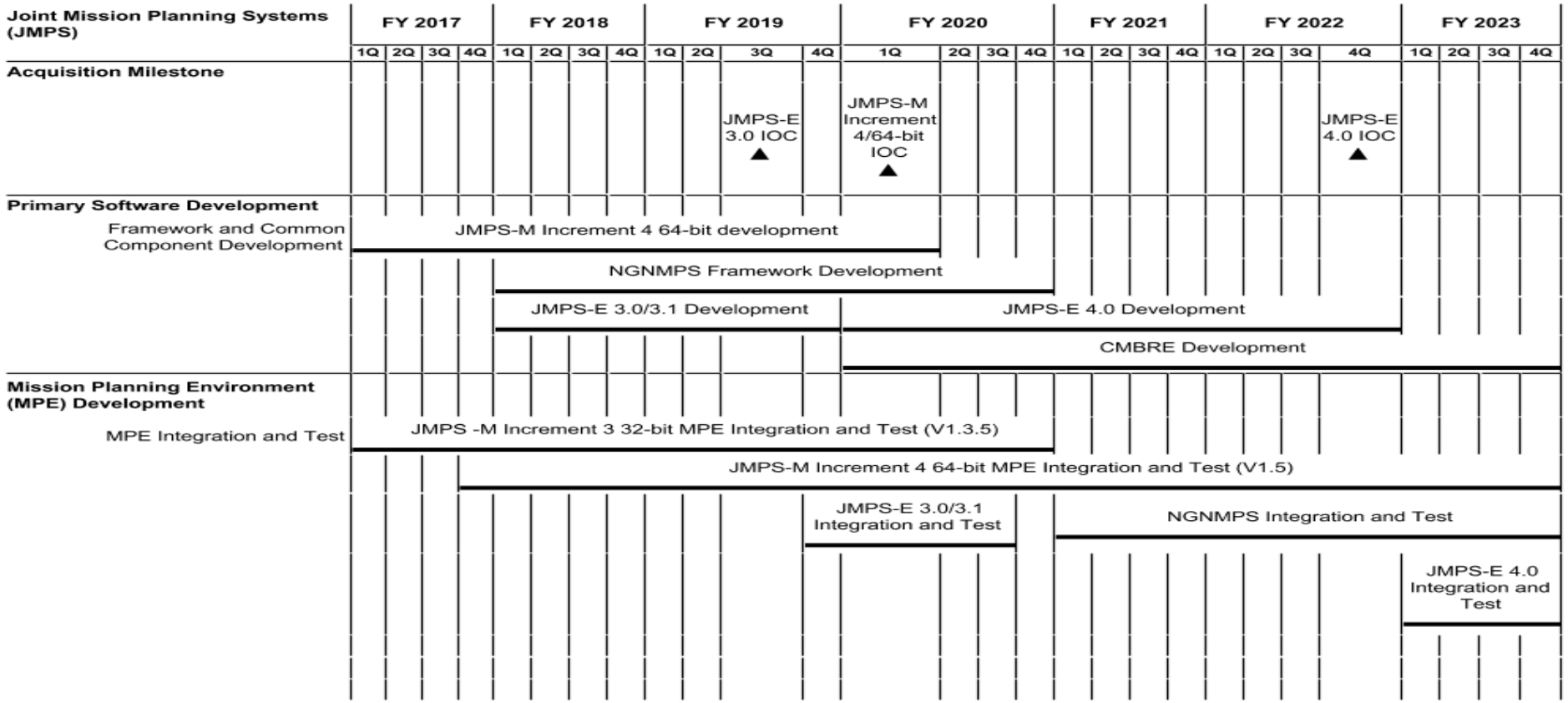
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support and Travel	WR	NAWCAD : Patuxtent River, MD	0.000	1.400	Nov 2016	1.600	Nov 2017	1.704	Nov 2018	-		1.704	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	Ausley Associates : Lexington Park, MD	0.000	0.509	May 2017	0.675	May 2018	0.689	May 2019	-		0.689	Continuing	Continuing	Continuing
		Subtotal	0.000	1.909		2.275		2.393		-		2.393	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	21.415		21.580		21.868		-		21.868	Continuing	Continuing	N/A

Remarks

Prior to FY17, the Mission Planning PU 2213 was funded under PE 0604231N.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2213 / *Mission Planning*



2019PB - 0605215N - 2213

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2213 / *Mission Planning*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Joint Mission Planning Systems (JMPS)				
Acquisition Milestone: JMPS-E 3.0 Initial Operational Capability (IOC)	3	2019	3	2019
Acquisition Milestone: JMPS-M Increment 4/ 64-Bit Initial Operational Capability (IOC)	1	2020	1	2020
Acquisition Milestone: JMPS-E 4.0 Initial Operational Capability (IOC)	4	2022	4	2022
Primary Software Development: Framework and Common Component Development: Increment 4 64-Bit Architecture Development	1	2017	1	2020
Primary Software Development: Framework and Common Component Development: NGNMPS Framework Development	1	2018	4	2020
Primary Software Development: Framework and Common Component Development: JMPS-E 3.0/3.1 Development	1	2018	4	2019
Primary Software Development: Framework and Common Component Development: JMPS-E 4.0 Development	1	2020	4	2022
Primary Software Development: Framework and Common Component Development: CMBRE Development	1	2020	4	2023
Mission Planning Environment (MPE) Development: MPE Integration and Test: 32 bit MPE Integration (V1.3.5)	1	2017	4	2020
Mission Planning Environment (MPE) Development: MPE Integration and Test: 64 bit MPE Integration (V1.5)	4	2017	4	2023
Mission Planning Environment (MPE) Development: MPE Integration and Test: NGNMPS Integration and Test	1	2021	4	2023
Mission Planning Environment (MPE) Development: MPE Integration and Test: JMPS-E 3.0/3.1 Integration and Test	4	2019	3	2020
Mission Planning Environment (MPE) Development: MPE Integration and Test: JMPS-E 4.0 Integration and Test	1	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605215N / *(U)Mission Planning*	Project (Number/Name) 2311 / *Stores Planning and Weaponeering Module*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2311: *Stores Planning and Weaponeering Module*	0.000	10.847	11.185	10.846	-	10.846	11.305	11.479	11.568	11.820	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Prior to FY17, Stores Planning and Weaponeering Module (PU 2311) was budgeted under Standards Development (PE 0604215N).

A. Mission Description and Budget Item Justification

The Weaponeering and Stores Planning (WASP) components are integrated software products that allow aircrew to determine the best combinations of weapons and delivery conditions to achieve the desired level of target damage, eliminate weapon delivery solutions that violate aircraft Type/Model/Series (T/M/S) specific safety-of-flight envelopes, and perform detailed weapons employment planning. WASP is approved by the Air Warfare Division (OPNAV N98) as the flight clearance implementation system for the F/A-18 A, A+, B, C, D, D (RC), E, F, EA-18G; and includes potential support for other platforms, to include F-35. WASP components will alert pilots if their planned weapon release conditions meet flight clearance limits, will result in bomb-to-bomb collisions, bomb-to-aircraft collisions, aircraft overstress, or excessive risk of aircraft loss/damage in the event of fuze early bursts. Weapon employment planning is fundamental to the Joint Capability Area of Force Application and joint mission areas of Strike and Amphibious Warfare. WASP provides the Navy and Marine Corps with weaponeering capabilities that are critical requirements for Interdiction, Armed Reconnaissance and Close Air Support mission planning. WASP is critical to successful employment of the Joint Mission Planning System (JMPS-M) for the F/A-18 A-F and EA-18G Mission Planning Environments (MPEs). WASP also affordably leverages a multitude of Government Furnished Information software components and tools including aircraft target maneuver simulations, and weapon flyout models. WASP requires updates as emergent requirements for new aircraft T/M/S, stores and weapons are approved, new flight clearances and flight restrictions are issued by Naval Air Systems Command Headquarters (NAVAIRSYSCOM), and cyber security mandates are released.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	5.541	5.803	5.685	0.000	5.685
Articles:	-	-	-	-	-
Description: Includes associated system engineering design, development, installation, integration and software development for Weaponeering and Stores Planning (WASP) components to support F/A-18 A-F and EA-18G. Provide domain engineering support for weapons separation, aircraft loads, flutter, fuzing and safe escape for application to WASP. Provide analysis of new requirements, allocation of requirements, design oversight, and life cycle management of the WASP program. Develop new aircraft configuration, aircraft loading, weapon optimization, store release and delivery planning components for F/A-18 A-F and EA-18G new flight clearances and flight restrictions issued by NAVAIRSYSCOM. Provide configuration management, system administration,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2311 / *Stores Planning and Weaponeering Module*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
quality assurance, documentation, metrics and software risk management for WASP. Acquire, integrate and modify numerous Government Furnished Information (GFI) software components and tools (aircraft target maneuver simulations, weapon flyout models, etc.) that are used for the WASP software development. Integrate WASP with Joint Standoff Weapon/Joint Direct Attack Munitions/Standoff Land-Attack Missile - Expanded Response and other weapons mission planning systems as required. ***FY 2018 Plans:*** Complete WASP v4.0 development. Begin the development of WASP v4.1 and the release of multiple database updates. ***FY 2019 Base Plans:*** Continue WASP v4.1 development and release of multiple database updates to WASP v4.0. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.118M from FY2018 to FY2019 due to accounting for the availability of prior year execution balances.					
Title: Test and Evaluation (T&E) ***Articles:*** ***Description:*** Provide test and evaluation for unit and system level testing; functional qualification testing; safety of flight certification testing; integration and standards compliance testing for WASP versions. Provide JMPS MPE Integration test support. Provide testing and test support to ensure all components (to include internally developed software, externally developed GFI) comply with Department of Navy (DoN) and Department of Defense (DoD) software mandates and directives. These include Integrated Shipboard Network System IT-21, Cyber Risk Management Framework (RMF), and Navy Marine Corps Intranet (NMCI). All Fleet released software must comply with DoN and DoD software directives to permit execution on ship Local Area Networks or NMCI. ***FY 2018 Plans:*** Complete test and evaluation of WASP major v4.0 to support an FY19 release to the Fleet. Complete test and evaluation of multiple database updates. ***FY 2019 Base Plans:***	2.269 -	2.194 -	2.020 -	0.000 -	2.020 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2311 / *Stores Planning and Weaponeering Module*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue test and evaluation of WASP v4.1 and complete test and evaluation on multiple database updates to WASP v4.0. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.147M from FY2018 to FY2019 due to accounting for the availability of prior year execution balances.					
Title: Program Management/Systems Engineering ***Articles:*** ***Description:*** Provide program management and systems engineering support, which includes requirements definition and analysis, compliance with Naval Air Systems Command systems engineering technical review processes, acquisition documentation development, cost, schedule and performance management, and compliance with external directives. Provide travel for government personnel. ***FY 2018 Plans:*** Continue project management and systems engineering support to the WASP for future software releases to the fleet. Additional support will be required for multiple database releases. ***FY 2019 Base Plans:*** Continue project management and systems engineering support to the WASP for future software releases to the fleet. Provide continued support for multiple database releases. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.047M from FY2018 to FY2019 due to accounting for the availability of prior year execution balances.	3.037 -	3.188 -	3.141 -	0.000 -	3.141 -
Accomplishments/Planned Programs Subtotals	10.847	11.185	10.846	0.000	10.846

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2311 / *Stores Planning and Weaponeering Module*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

Weaponeering and Stores Planning (WASP) products, delivered annually, are developed in-house by NAVAIR consisting of Naval Air Warfare Center Aircraft Division and Naval Air Warfare Center Weapons Division engineers and support contractors. The team has migrated to a smaller government team that provides functional expertise in aircraft safety-of-flight (air-vehicle stores compatibility, weapons separation, aircraft aerodynamic flutter, ground/flight loads, authorized fuze arm times, aircraft safe escape), guided weapons employment and weapons effects against targets, with the majority of the software development conducted by various contractors. The Government, engineering, test, and support teams (test facilities, functional qualification testing and certification/accreditation test) are supplemented with contractor labor.

E. Performance Metrics

Average time to plan a flight: Threshold value is < 1 hour average time to plan a flight that includes full aircraft loadout and weapons delivery safe escape planning. Objective value is < 15 minutes average time to plan a flight that includes full aircraft loadout and weapons delivery safe escape planning. End product is a pilot's z-diagram kneeboard card.

Interoperability: Threshold value is 100% stand alone value.
Objective value is 100% stand alone value.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2311 / *Stores Planning and Weaponeering Module*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	WR	Naval Air Warfare Center Aircraft Division NAWCAD : Patuxent River, MD	0.000	0.177	Nov 2016	0.102	Nov 2017	0.100	Nov 2018	-		0.100	Continuing	Continuing	Continuing
Product Development	WR	Air Force Seek Eagle : Hill Air Force Base, UT	0.000	0.083	Mar 2017	0.085	Mar 2018	0.085	Mar 2019	-		0.085	Continuing	Continuing	Continuing
Primary Software Development	C/CPFF	DCS Corp : Alexandria, VA	0.000	0.781	Feb 2017	1.721	Feb 2018	0.000		-		0.000	0.000	2.502	2.502
Product Development (V4.X)	C/CPFF	DCS Corp : Alexandria, VA	0.000	4.500	Apr 2017	3.895	Mar 2018	5.500	Mar 2019	-		5.500	Continuing	Continuing	Continuing
		Subtotal	0.000	5.541		5.803		5.685		-		5.685	Continuing	Continuing	N/A

Remarks

The FY19 Product Development (V4.X) effort increase from FY18 is accounting for costs associated with the development of WASP V4.1 and multiple minor builds to support WASP v4.0. In FY18, the minor build costs were budgeted under the Primary Software Development line and the major build costs were budgeted under Product Development (V4.X). There is no cost increase for WASP development efforts in FY19.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation (Gov't)	WR	NAWCAD : Patuxent River, MD	0.000	1.185	Nov 2016	1.303	Nov 2017	1.190	Nov 2018	-		1.190	Continuing	Continuing	Continuing
Test & Evaluation (Contractor)	C/CPFF	DCS Corp : Alexandria, VA	0.000	1.084	Mar 2017	0.891	Mar 2018	0.830	Mar 2019	-		0.830	0.000	2.805	2.805
		Subtotal	0.000	2.269		2.194		2.020		-		2.020	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2311 / *Stores Planning and Weaponeering Module*

Management Services ($ in Millions)

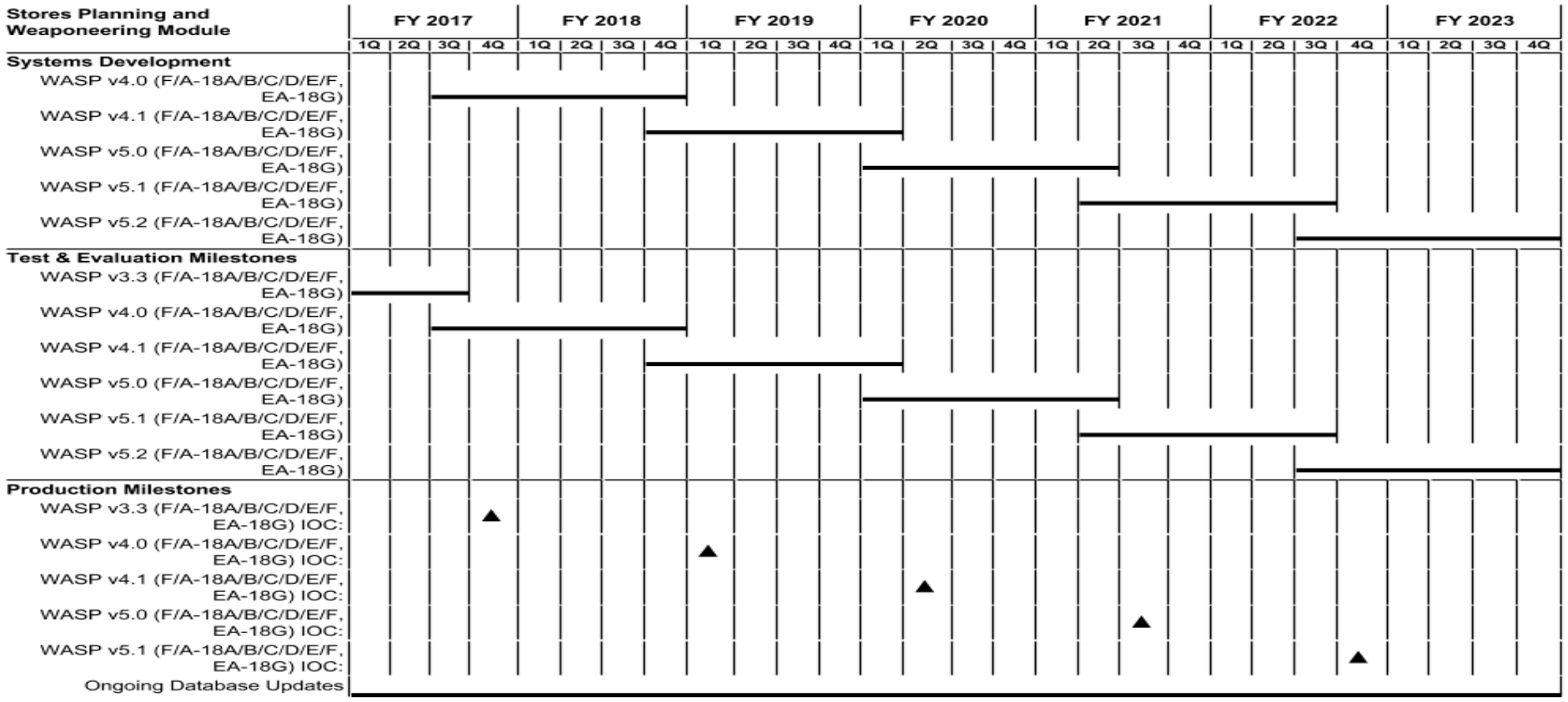
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering and Program Support	WR	NAWCAD : Patuxent River, MD	0.000	1.003	Nov 2016	1.200	Nov 2017	1.219	Nov 2018	-		1.219	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	Ausley : Lexington Park, MD	0.000	0.441	May 2017	0.450	May 2018	0.307	May 2019	-		0.307	0.000	1.198	1.341
Government Engineering Support: Guided Weapons	WR	Naval Air Warfare Center Weapons Division NAWCWD : China Lake, CA	0.000	0.023	Jan 2017	0.223	Jan 2018	0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
Systems Engineering Support	C/CPFF	Wyle : Huntsville, AL	0.000	1.500	Jan 2017	1.200	Jan 2018	1.250	Mar 2019	-		1.250	0.000	3.950	3.950
Govt Engineering Support: Mission Planning Environment Integration	WR	NAWCWD : Point Mugu, CA	0.000	0.060	Nov 2016	0.100	Nov 2017	0.100	Nov 2018	-		0.100	Continuing	Continuing	Continuing
Travel	Various	NAVAIR : Patuxent River, MD	0.000	0.010	Nov 2016	0.015	Nov 2017	0.015	Nov 2018	-		0.015	Continuing	Continuing	Continuing
		Subtotal	0.000	3.037		3.188		3.141		-		3.141	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	10.847		11.185		10.846		-		10.846	Continuing	Continuing	N/A

Remarks

Prior to FY17, PU 2311 was budgeted under PE 0604215N.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2311 / *Stores Planning and Weaponeering Module*



2019DON - 0605215N - 2311

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2311 / *Stores Planning and Weaponeering Module*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Stores Planning and Weaponeering Module				
Systems Development: WASP v4.0 (F/A-18A/B/C/D/E/F, EA-18G):	3	2017	4	2018
Systems Development: WASP v4.1 (F/A-18A/B/C/D/E/F, EA-18G):	4	2018	1	2020
Systems Development: WASP v5.0 (F/A-18A/B/C/D/E/F, EA-18G):	1	2020	2	2021
Systems Development: WASP v5.1 (F/A-18A/B/C/D/E/F, EA-18G):	2	2021	3	2022
Systems Development: WASP v5.2 (F/A-18A/B/C/D/E/F, EA-18G):	3	2022	4	2023
Test & Evaluation Milestones: WASP v3.3 (F/A-18A/B/C/D/E/F, EA-18G):	1	2017	3	2017
Test & Evaluation Milestones: WASP v4.0 (F/A-18A/B/C/D/E/F, EA-18G):	3	2017	4	2018
Test & Evaluation Milestones: WASP v4.1 (F/A-18A/B/C/D/E/F, EA-18G):	4	2018	1	2020
Test & Evaluation Milestones: WASP v5.0 (F/A-18A/B/C/D/E/F, EA-18G):	1	2020	2	2021
Test & Evaluation Milestones: WASP v5.1 (F/A-18A/B/C/D/E/F, EA-18G):	2	2021	3	2022
Test & Evaluation Milestones: WASP v5.2 (F/A-18A/B/C/D/E/F, EA-18G):	3	2022	4	2023
Production Milestones: WASP v3.3 (F/A-18A/B/C/D/E/F, EA-18G) IOC::	4	2017	4	2017
Production Milestones: WASP v4.0 (F/A-18A/B/C/D/E/F, EA-18G) IOC::	1	2019	1	2019
Production Milestones: WASP v4.1 (F/A-18A/B/C/D/E/F, EA-18G) IOC::	2	2020	2	2020
Production Milestones: WASP v5.0 (F/A-18A/B/C/D/E/F, EA-18G) IOC::	3	2021	3	2021
Production Milestones: WASP v5.1 (F/A-18A/B/C/D/E/F, EA-18G) IOC::	4	2022	4	2022
Production Milestones: Ongoing Database Updates:	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605215N / *(U)Mission Planning*	Project (Number/Name) 2312 / *Common Helicopters*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2312: *Common Helicopters*	0.000	0.614	0.665	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.279
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Prior to FY17, Common Helicopters (PU 2312) was budgeted under Standards Development (PE 0604215N). FY19 and out Common Helicopters (PU 2312) was consolidated under PU 2213 Mission Planning in this PE.

A. Mission Description and Budget Item Justification

Automated mission planning systems have focused on developing planning capabilities for fixed-wing aircraft, while the unique planning requirements for helicopters are not yet fully addressed. The unique and enhanced automated mission planning requirements that must be developed and implemented for helicopters include: data loading, an enhanced route editor (serpentine routing, hover), manipulation of higher fidelity (smaller scale) maps and imagery, enhanced performance tools (performance in and out of ground effect, performance degradation due to atmospheric conditions & elevation), and enhanced fidelity of landing zone, target zone, and threat analyses. The following type/model/series aircraft are supported by this PU: AH-1W/Z, UH-1N/Y, H-46/E, H-53D/E, H-60H/R/S and V-22. Common helicopter functionality will be developed for implementation in Joint Mission Planning System (JMPS).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	0.614	0.400	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Development of Common Helicopter functionality and integration with JMPS Framework Versions and 64-bit Operating System. Common Components include Common Mission Data Loader (CMDL), Weapon Employment Zone Overlays Tool (WEZOT) and Point Selection Tool (PST).					
FY 2018 Plans: Continue the development of Common Mission Data Loader (CMDL), Point Selection Tool (PST), and Weapon Employment Zone Overlays Tool (WEZOT).					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2312 / *Common Helicopters*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Decrease of $0.400M from FY2018 to FY2019 due to consolidating Common Helicopter efforts under PU 2213 Mission Planning.					
Title: Test and Evaluation ***Articles:*** ***Description:*** Integration and test of Common Helicopter functionality with JMPS Framework Versions and 64-bit Operating System. Common Components include Common Mission Data Loader (CMDL), Weapon Employment Zone Overlays Tool (WEZOT) and Point Selection Tool (PST). ***FY 2018 Plans:*** Provide integration and test support for Common Mission Data Loader (CMDL), Point Selection Tool (PST), and Weapon Employment Zone Overlays Tool (WEZOT) for the 64-bit transition to JMPS framework 1.5.x. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.265M from FY2018 to FY2019 due to consolidating Common Helicopter efforts under PU 2213 Mission Planning.	0.000 -	0.265 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	0.614	0.665	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

Export Mission Data to Data Transfer Device: Threshold value is < 12 minutes to transfer navigation, communication, weapon system initialization settings and intelligence data. Interoperability: Threshold value is 100% of top level Information Exchange Requirements (IERs) designated critical will be satisfied. Objective value is 100% of top level IERs will be satisfied.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605215N / *(U)Mission Planning*	Project (Number/Name) 2312 / *Common Helicopters*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Software Development	C/CPFF	Joint Technology Engineering : Valparaiso, FL	0.000	0.614	Apr 2017	0.400	Mar 2018	0.000		-		0.000	0.000	1.014	1.014
		Subtotal	0.000	0.614		0.400		0.000		-		0.000	0.000	1.014	N/A

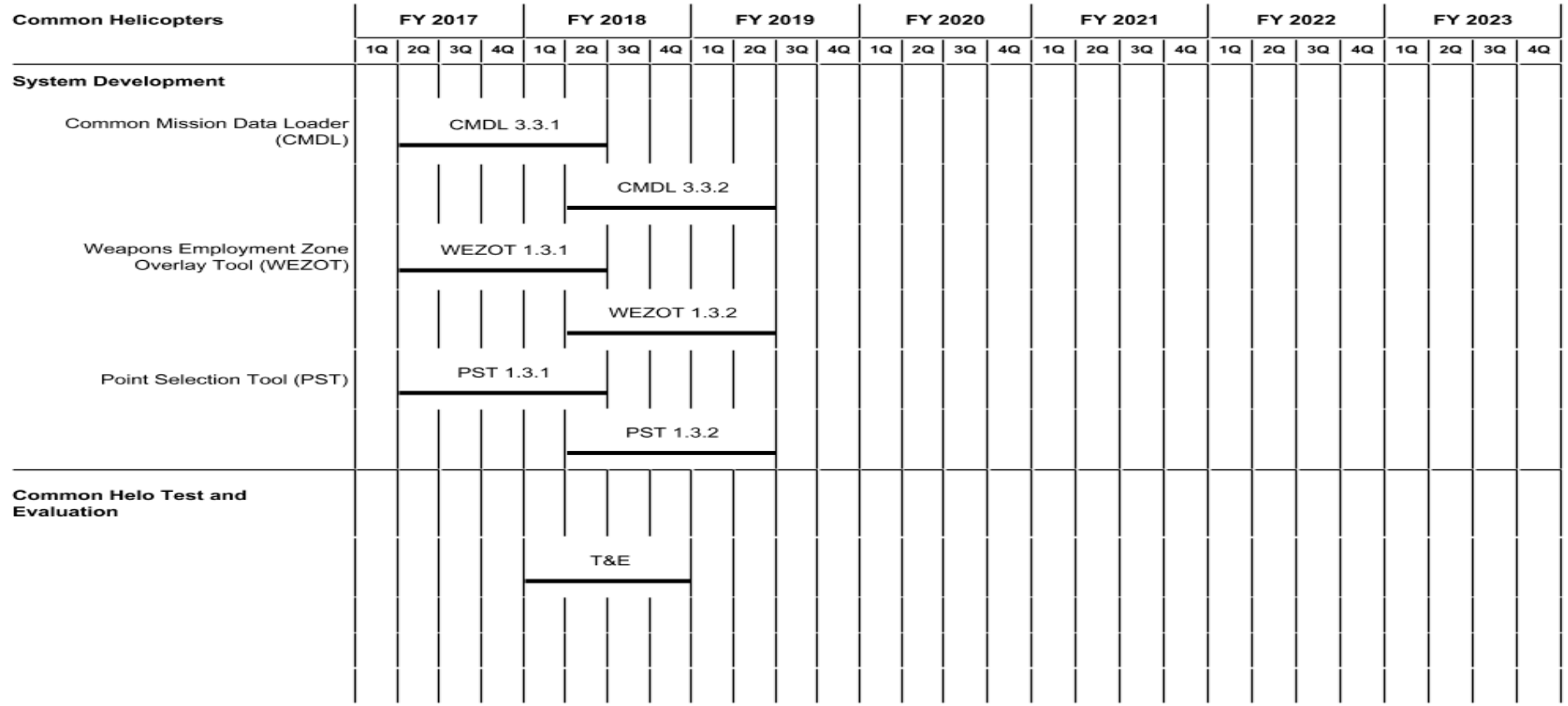
Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Integration and Test	WR	NAWCWD : Point Mugu, CA	0.000	0.000		0.265	Nov 2017	0.000		-		0.000	0.000	0.265	-
		Subtotal	0.000	0.000		0.265		0.000		-		0.000	0.000	0.265	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.614		0.665		0.000		-		0.000	0.000	1.279	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2312 / *Common Helicopters*



2019PB - 0605215N - 2312

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605215N / *(U)Mission Planning*	**Project (Number/Name)** 2312 / *Common Helicopters*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Common Helicopters				
System Development: Common Mission Data Loader (CMDL): CMDL 3.3.1	2	2017	2	2018
System Development: Common Mission Data Loader (CMDL): CMDL 3.3.2	2	2018	2	2019
System Development: Weapons Employment Zone Overlay Tool (WEZOT): WEZOT 1.3.1	2	2017	2	2018
System Development: Weapons Employment Zone Overlay Tool (WEZOT): WEZOT 1.3.2	2	2018	2	2019
System Development: Point Selection Tool (PST): PST 1.3.1	2	2017	2	2018
System Development: Point Selection Tool (PST): PST 1.3.2	2	2018	2	2019
Common Helo Test and Evaluation:	1	2018	4	2018

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605217N *I (U)Common Avionics*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	42.711	58.163	51.486	-	51.486	46.841	36.037	35.882	36.630	Continuing	Continuing
0572: *JT Service/NV Std Avionics CP/SB*	0.000	42.711	53.512	51.486	-	51.486	46.841	36.037	35.882	36.630	Continuing	Continuing
3425: *Digital Warfare*	0.000	0.000	4.651	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.651

Note

Digital Warfare (DW) efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare.

(U) Common Avionics schedule FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

A. Mission Description and Budget Item Justification

This project provides for the identification, study, design, development, demonstration, test, evaluation, and qualification of standard avionics capabilities for Navy use, and wherever practicable, use across all Services and Foreign Military Sales. Such air combat electronics developments include communications and airborne networking, navigation and sensors, flight avionics, safety systems, and flight mission information systems for both forward fit and retrofit aircraft. These efforts continue to maintain federated systems while encouraging transition of procurements to support a modular system for enhanced performance and affordability. Consideration is given up front to reduce acquisition costs through larger procurement quantities that satisfy multi-aircraft customer requirements and that reduce life cycle costs in the areas of reliability, maintainability, and training.

Digital Warfare(DW) supports systems of systems requirements modeling and allocation, development of data technical baselines, digital architectures and data models, and provides data science for enterprise and warfare pilots in support of a composable, modular Navy. DW efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605217N *I (U)Common Avionics*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	54.599	58.163	62.003	-	62.003
Current President's Budget	42.711	58.163	51.486	-	51.486
Total Adjustments	-11.888	0.000	-10.517	-	-10.517
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-5.650	0.000			
• SBIR/STTR Transfer	-1.130	0.000			
• Program Adjustments	-3.000	0.000	-9.716	-	-9.716
• Rate/Misc Adjustments	0.000	0.000	-0.801	-	-0.801
• Congressional General Reductions Adjustments	-0.021	-	-	-	-
• Congressional Directed Reductions Adjustments	-2.087	-	-	-	-

Change Summary Explanation

Technical: Not applicable.

Schedule:

Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM): CH-53K Integration/Certification of 8.33 kHz, Mode S, Reduced Vertical Separation Minimums (RVSM), Required Navigation Performance/Area Navigation (RNP/RNAV), and Automatic Dependent Surveillance-Broadcast Out (ADS-B (Out)) effort slid to 1Q/18 due to FY17 Congressional adjustment. Evaluate ADS-BO technologies/develop solutions to support platform integrations and develop CNS/ATM Common Component to support RNP/RNAV developmental platform requirements extended to 4Q/23.

Tactical Communications: Extended Transmission Security (TRANSEC) and Crypto Modernization (Suite B) to 4Q/23. Added NSA Certification 5 to 3Q/23 and added OFP Software Production Milestone to 1Q/23. SATCOM S/W Development with Mobile User Objective System extended to 2Q/19 due to the additional qualification testing that is required for MUOS.

Ground Proximity Warning System/Terrain Awareness System (GPWS/TAWS II): Edits made to schedule to incorporate changes in schedule dates to align to both V-22 and H-60 platforms' schedules; extended H-60 TAWS II Software Development completion date to 4Q/17; added H-60 TAWS II IOC 2Q/19; shifted V-22 TAWS II Requirements Development from 1Q/18 to 2Q/19; added TAWS II Software Re-Architecture 1Q/18 to incorporate MIL-STD 882E Level 1

requirements; Shifted V-22 TAWS II Software Development from 1Q/19 to 1Q/20; added V-22 Integration contract in 3Q/20; shifted V-22 TAWS II Developmental Test from 1Q/21 to 4Q/21.

Collaborative Warfare (CW): Naval Aviation Netted Sensors and Maritime Targeting Experimentation, Naval Aviation and Maritime Targeting Requirements and CONOPS, Standards and Architectures/Requirements Development all extended to 4Q/23.

Mid Air Collision Avoidance Capability: Budget realigned FY18-FY23 per the Office of the Chief of Naval Operations (OPNAV) direction. Added Analysis of Alternatives for 1Q/19, added DoD Architectural Framework Development 1Q/18, added Model Based Systems Engineering (MBSE) 1Q/18, extended Phase 2 Risk Reduction for Prototyping of Algorithms and Software extended to 4Q/23. MDD/ASR shifted from 2Q/18 to 4Q/22, RFP Release Decision shifted from 2Q/19 to 2Q/23 , added Draft CDD Submitted for 2Q/22, added CDD Approved 2Q/23, Integrated Logistics Assessment shifted from 3Q/19 to 3Q/23, Milestone B shifted from 4Q/19 to 4Q/23. The following were deleted: SRB/SRR 1Q/19, Phase 2 Spec Development 1Q18, SFR 2Q/19, PDR 3Q/19, Software Design and Development 1Q/20, CDR 3Q/20, Platform Integration and Test Support 3Q/21, MH-60R/S DT 3Q/22, and TRR 3Q/22.

(U) Common Avionics schedule FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

3425: Digital Warfare (DW) stood up separately within Program Element to set requirements, prioritize resources, and lead efforts on information interoperability and human/machine teaming starting 1QTR FY18 through the FYDP. DW efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare.

Project Unit 0572 JT Service/NV Std Avionics CP/SB: The FY 2019 funding request was reduced by $2.500 million to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 0572 / *JT Service/NV Std Avionics CP/SB*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0572: *JT Service/NV Std Avionics CP/SB*	0.000	42.711	53.512	51.486	-	51.486	46.841	36.037	35.882	36.630	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

(U) Common Avionics schedule FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

A. Mission Description and Budget Item Justification

Joint Services/Navy Standard Avionics Components and Subsystems: This project provides for the identification, study, design, development, demonstration, test, evaluation, and qualification of standard avionics capabilities for Navy use, and wherever practicable, use across all Services and Foreign Military Sales. Standard avionics capabilities under
development include the Joint Service Review Committee for Avionics Standardization (JSRC-AS), Communication Navigation Surveillance/Air Traffic Management (CNS/ATM), Tactical Communications (TACCOM), Ground Proximity Warning System/Terrain Awareness Warning System (GPWS/TAWS II), Collaborative Warfare (CW), Avionics Component Improvement Program (AvCIP), Mid Air Collision Avoidance Capability (MCAC), and Avionics Architectures Team (AAT). Participation in Human Factors Quality Management Board ensures Navy safety upgrades and mandatory safety improvements for naval aircraft.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Joint Service Review Committee for Avionics Standardization (JSRC-AS)	0.462	0.995	0.995	0.000	0.995
Articles:	-	-	-	-	-
Description: The JSRC-AS program supports Congressional and Assistant Secretary of the Navy for Research, Development and Acquisition direction to control the growing proliferation of unique avionics and improve coordination among the services through the identification, development, and promotion of investigative and development efforts across the services and U.S. Coast Guard. The JSRC-AS supports the development, analysis and review of new avionics requirements with potential for joint service application. The JSRC-AS consists of an O-6 Level principal from each service and U.S. Coast Guard, as well as the appropriate staff, to support joint service working group efforts. The JSRC-AS reports to the O-7 level tri-service Aviation Common Systems Board who reports to the O-9 level Joint Aeronautical Commanders Group.					
FY 2018 Plans: Provide leadership in support of the Navy's interest to the Joint Services Review Committee for Avionics Standardization (JSRC-AS) tri-service committee promoting commonality and joint programs with focus on					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
interoperability, communications, navigation, Joint Services avionics obsolescence management, and update of the Core Avionics Master Plan. ***FY 2019 Base Plans:*** Provide leadership in support of the Navy's interest to the JSRC-AS tri-service committee promoting commonality and joint programs with focus on interoperability, communications, navigation, Joint Services avionics obsolescence management, and update of the Core Avionics Master Plan. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Title: Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) ***Articles:*** ***Description:*** This program will conduct and support CNS/ATM research, studies, development, integration, demonstration, test and evaluation efforts for Naval aviation platforms in development. Platform integration of Mode Select (S), 8.33 kHz, Reduced Vertical Separation Minimum (RVSM), Required Navigation Performance Area Navigation (RNP/RNAV) to include M Code, and Automatic Dependent Surveillance-Broadcast Out (ADS-B (Out)) functional integration and certification efforts into Naval aircraft. Assist with insertion of communication, navigation, surveillance, and supporting technologies and conduct capability certification on developmental platforms such as F-35, CH-53K, and Unmanned Air Systems. Capabilities include Mode S, 8.33 kHz, RVSM, RNP/RNAV, ADS-BO, and other civil and military capabilities. ***FY 2018 Plans:*** Assist with insertion and integration of CNS/ATM technologies and certification of developmental platforms. Evaluate technologies and develop solutions to support platform integrations. Develop CNS/ATM Common Components to support RNP RNAV developmental platform requirements. Continue integration/certification of Mode Select, 8.33 kHz, RVSM, RNP/RNAV, and ADS-BO into CH-53K. Research and develop GPS enhancements to support CNS/ATM RNP/RNAV improvements. Research and develop Automatic Dependent Surveillance-Broadcast Out (ADS-BO) System Design Assurance requirements as well as compatibility with the emerging Global Positioning System (GPS) M Code and its impact on Required Navigation Performance Area Navigation (RNP/ RNAV). ***FY 2019 Base Plans:***	0.484 -	2.952 -	1.368 -	0.000 -	1.368 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Assist with insertion and integration of Communication Navigation Surveillance/Air Traffic Management (CNS/ ATM) technologies and certification of developmental platforms. Evaluate technologies and develop solutions to support platform integrations. Develop CNS/ATM Common Components to support RNP/RNAV developmental platform requirements. Continue integration/certification of Mode Select, 8.33 kHz, Reduced Vertical Separation Minimum (RVSM), RNP/RNAV, and ADS-B (Out) into CH-53K. Research and develop GPS enhancements to support CNS/ATM RNP RNAV improvements. Research and develop ADS-B (Out) System Design Assurance requirements as well as compatibility with the emerging GPS M Code and its impact on RNP RNAV. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease between FY18 and FY19 is due to the contract that awarded in FY18 for the CH-53K primary hardware development contract for ADS-B (Out).					
Title: Tactical Communications (TACCOM)	18.632	19.777	19.479	0.000	19.479
Articles:	-	-	-	-	-
Description: This program will conduct research, studies, development, integration, demonstration, test and evaluation efforts to ensure tactical communication systems and capabilities are developed and available to support naval aviation requirements. Perform tactical communication platform integration studies and activities to determine technical and cost effective solutions across naval aviation. Develop tactical communications (voice/data) requirements, concepts and systems which have application across naval aviation. Support all necessary tasks to ensure evolution of legacy communications systems incorporating programmable Communication Security/Information Assurance, Transmission Security (TRANSEC) mandated National Security Agency (NSA) Crypto Modernization initiatives, Tactical Secure Voice (TSV) Suite B, Combat Net Radio (CNR) Variable Message Format (VMF), Beyond Line-of-Sight, Satellite Communication (SATCOM) Modernization including Mobile User Objective System (MUOS), High Frequency, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN) civil interoperability, and data link into the ARC-210 system. Support for networking requirements development and prototyping, Integrated Waveform (IW), Intelligence Broadcast System over modern Code Division Multiple Access based satellite channels, Tactical Networks, Data Links, and Link 16. ***FY 2018 Plans:*** Continue Satellite Communication (SATCOM) Software (S/W) development with Mobile User Objective System (MUOS) capabilities. Continue Operational Flight Plan (OFP) S/W integration. Continue crypto engine					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
integration for NSA and Information Assurance (IA) certification. Continue Combat Net radio interoperability with SATURN waveform. Complete red-side provisioning options for the RT-2036. Continue Transmission Security (TRANSEC) SATCOM Crypto Modernization in accordance with NSA directives and Tactical Secure Voice (TSV) Suite B for interoperability. ***FY 2019 Base Plans:*** Continue SATCOM S/W development with MUOS capabilities. Complete crypto engine integration for NSA and Information Assurance (IA) certification. Continue Combat Net radio interoperability with SATURN waveform. Continue TRANSEC SATCOM Crypto Modernization in accordance with NSA directives and TSV Suite B for interoperability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease between FY18 and FY19 is due to the finalization for the Operational Flight Plan Software Integration efforts in FY18.					
Title: Ground Proximity Warning System/Terrain Awareness Warning System (GPWS/TAWS II) ***Articles:*** ***Description:*** This program will conduct research, studies, development, integration, demonstration, test and evaluation efforts to meet naval aviation GPWS/TAWS II requirements. These requirements span all operational modes and operational environments, to include Degraded Visual Environment. Perform GPWS/TAWS II platform integration studies and activities to determine technical and cost effective solutions across naval aviation. Develop GPWS/TAWS II solutions tailored to platform performance and range of military operations. Develop simulation models for use at Manned Flight Simulator (MFS) or other simulation environments as required for platform tailoring, including procurement of test article hardware. Evaluate aircraft simulation models for suitability in GPWS/TAWS II development effort. Develop GPWS/TAWS II algorithms utilizing simulation environments as real-time hardware and pilot in the loop tool. Develop and evaluate algorithm interfaces necessary for integration of the algorithm within platform host computer. Develop software code to execute GPWS/TAWS II algorithm in host platforms. ***FY 2018 Plans:***	2.131 -	8.668 -	7.843 -	0.000 -	7.843 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete Phase I & II DT on MH-60R/S. Conduct Milestone C and Fleet Release of Terrain Awareness Warning System (TAWS II) on MH-60R/S. Conduct TAWS II Software Re-Architecture. ***FY 2019 Base Plans:*** Fleet Release of TAWS II on MH-60R/S IOC. Complete TAWS II Software Re-Architecture. Initiate V-22 TAWS II Requirements Development. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease between FY18 and FY19 is due to the finalization of the initial H-60 TAWS II Developmental Testing.					
Title: Collaborative Warfare (CW)	0.204	0.240	0.244	0.000	0.244
Articles:	-	-	-	-	-
Description: The CW component is a Research & Development effort to identify targeting gaps and determine the warfighting benefit of integrating networked capabilities into naval aircraft to fill those gaps. The CW component also addresses maritime targeting gaps for naval aircraft to operate more effectively with other military services. The following efforts are included: 1) Comprehensive naval aviation and maritime targeting requirements that map fleet gaps and requirements to cross-platform naval aviation solutions. 2) Netted sensors and maritime targeting capability proof of concept prototype demonstrations leveraging the Navy's Fleet Experimentation campaign. 3) Coordinating Naval Aviation requirements with the Office of Naval Research Future Naval Capability Enabling Capability for the Common Radio Enhancement (CoRE). 4) Coordination of Naval Aviation strategy with Intelligence Community (IC) efforts in the areas of High Side Data Fusion, Combat Systems Integration, and National to Tactical Integration. ***FY 2018 Plans:*** Continue executing to Naval Aviation and Maritime Targeting Experimentation and Requirements. Develop requirements, standards, and architectures in support of new and updated netted-sensors' Concept of Operations and capabilities. ***FY 2019 Base Plans:*** Continue executing to Naval Aviation and Maritime Targeting Experimentation and Requirements. Develop requirements, standards, and architectures in support of new and updated netted-sensors' Concept of Operations and capabilities. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase between FY18 and FY19 is due to the inflation pricing factors for Systems Engineering efforts.					
Title: Avionics Component Improvement Program (AvCIP)	4.403	4.572	4.872	0.000	4.872
Articles:	-	-	-	-	-
Description: Investigate high value Return On Investment component improvement candidate projects in support of NAVAIR Commander's focus areas of Readiness and Speed to the Fleet. Stop operating and sustainment cost growth by reducing costs for fielded systems and implementing life-cycle cost reduction initiatives as part of new systems development. This program positions resources for next year application to fast-track corrections to existing problematic systems. Projects address critical readiness issues (significant back-orders or impending sustainability failures that threaten to down aircraft), functional performance obsolescence issues (system failing to support mission requirement), and top sustainment cost drivers (out of proportion annual maintenance or repair costs). Resources enable design and development of technology insertion and product redesign or replacement to meet readiness goals, meet mission objectives, or reduce overall sustainment costs. Candidate projects are submitted via a rigorous template, reviewed by a panel of Avionics professionals, and selected based upon urgency, warfighting contributions, breadth of application and scope of Return On Investment. Resources cover non-recurring engineering elements (including design and development, prototypes, platform integration, test and evaluation), program management and associated logistics elements (including technical data preparation, support equipment, provisioning, and training). Analysis shows under this program between 2006 and 2017 has enabled sustainment and procurement cost avoidances in excess of $275M in cost for the $62M of funding invested through 2017.					
FY 2018 Plans: Address current fleet problem avionics systems (top readiness degraders, cost drivers, obsolescence-driven sustainability, capability loss, fleet head-hurters).					
FY 2019 Base Plans: Address current fleet problem avionics systems (top readiness degraders, cost drivers, obsolescence-driven sustainability, capability loss, fleet head-hurters).					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase between FY18 and FY19 is due to increase in Primary Hardware Development for AVCIP projects.					
Title: Mid Air Collision Avoidance Capability (MCAC)	2.856	2.108	3.500	0.000	3.500
Articles:	-	-	-	-	-
Description: This program will conduct research, studies, and development, integration, demonstration, test and evaluation efforts to meet Naval Aviation Mid Air Collision Avoidance Capability (MCAC) requirements. These requirements span all operational modes and operational environments, to include Degraded Visual Environment. Perform (MCAC) platform integration studies and activities to determine technical and cost effective solutions across Naval Aviation. Develop MCAC solutions tailored to platform performance and range of military operations. Develop simulation models for use at Manned Flight Simulator (MFS) or other simulation environments as required for platform tailoring, including procurement of test article hardware. Evaluate aircraft simulation models for suitability in MCAC development effort. Develop MCAC solutions utilizing simulation environments as real-time hardware and pilot in the loop tools. Develop and evaluate interfaces necessary for integration of MCAC within platform host environment.					
FY 2018 Plans: Complete documentation/efforts to support the program re-phase and commencement of an Analysis of Alternatives (AoA) in FY19. Initiate MBSE methodology implementation for capturing systems requirements and begin Phase II Risk Reduction Prototyping to evaluate MCAC algorithm and software. Initiate the DoDAF development.					
FY 2019 Base Plans: Commencement of AoA. Continue MBSE methodology implementation for capturing systems requirements based on initial AoA guidance/findings. Continue Phase II Risk Reduction Prototyping to evaluate MCAC algorithm and software. Continue collaboration with other engineering competencies and platform PMAs to capitalize on existing development of related capabilities for potential adoption.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase between FY18 and FY19 is due to the initiation and execution of the Analysis of Alternatives in FY19 to capitalize on existing development of related capabilities for potential adoption.					
Title: Avionics Architectures Team (AAT)	13.539	14.200	13.185	0.000	13.185
Articles:	-	-	-	-	-
Description: The Avionics Architectures Team (AAT) provides hardware and software (HW/SW) standards and product line development and management for common HW/SW operating environments to establish testable open architecture requirements in accordance with National Defense Authorization Act (NDAA) Section 801 Open Architecture language, DoD Directive 5000.1, N6/N7 Naval Open Architecture Requirements Letter 9010, Ser. N6N7/5U916276, and SECNAVINST 5000.2E. The Future Airborne Capability Environment (FACE) Technical Standard is developed through Navy, Army, Air Force, Industry and Academia collaboration in accordance with Public Law 104-113. The Hardware Open Systems Technologies (HOST) standard is being developed through government and academia collaboration and will be provided to industry for prototyping efforts. The Functional Architecture for Strategic Reuse (FASTR) initiative will define a standard process for mission level capability decomposition to support product line development and management. The AAT provides Subject Matter Experts to define and architect a set of Open Architecture Standards and product lines, design principles and guidance, development and integration tools, acquisition strategy, contracting guidance and cost estimates. The results will enable Department of Defense (DoD) weapons systems to systematically procure open, modular and reconfigurable software architectures, reuse HW/SW and deliver scalable, portable and interoperable war fighting capabilities at a faster rate, reducing redundant development costs and increasing competition. Infrastructure components and frameworks built to these standards will support Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) capability upgrades on various platforms by enabling integration of common, non-proprietary applications. The AAT initiatives enable the government's role as Lead Systems Integrator, per the Weapons System Acquisition Reform Act (WSARA) 2009, and cost effectively manage data rights for reuse across the DoD. ***FY 2018 Plans:*** Provide development support, mission based engineering, systems engineering and program management for design and acquisition strategy implementation guidance. Generate revisions for future editions of the FACE Technical Standard based on issues identified by government and industry consortium and develop corresponding conformance tools. Research new hardware technologies and develop Tier 2 Hardware Open Systems Technologies (HOST) specifications to support widely adopted commercial technologies and platform requirements. Provide input to platforms developing Tier 3 HOST specifications. Assist platforms with strategies for modular functional architectures and implementation of FACE and HOST standards. Participate					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
in international collaboration efforts to define comprehensive open architecture strategy. Generate alignment strategies for a comprehensive open architecture approach between Navy, Army and Air Force. Support the implementation of Naval Aviation's data model strategy. Provide subject Matter Expert support for platform integration and competitive source selection. Academia prototyping and demonstration efforts for FACE, FASTR and HOST initiatives. ***FY 2019 Base Plans:*** Provide development support, mission based engineering, systems engineering and program management for design and acquisition strategy implementation guidance. Generate revisions for future editions of the FACE Technical Standard based on issues identified by government and industry consortium and develop corresponding conformance tools. Research new hardware technologies and develop Tier 2 HOST specifications to support widely adopted commercial technologies and platform requirements. Provide input to platforms developing Tier 3 HOST specifications. Assist platforms with strategies for modular functional architectures and implementation of FACE and HOST standards. Participate in international collaboration efforts to define comprehensive open architecture strategy. Generate alignment strategies for a comprehensive open architecture approach between Navy, Army and Air Force. Support the implementation of Naval Aviation's data model strategy. Provide subject Matter Expert support for platform integration and competitive source selection. Academia prototyping and demonstration efforts for FACE, FASTR and HOST initiatives. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease between FY18 and FY19 is due to the shift from Systems Engineering to Primary Hardware Development for prototyping efforts.					
Accomplishments/Planned Programs Subtotals	42.711	53.512	51.486	0.000	51.486

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0577: *Common Avionics Changes*	144.838	123.507	117.551	-	117.551	83.544	91.236	105.177	129.379	562.115	3,817.994

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

D. Acquisition Strategy

Communication Navigation Surveillance/Air Traffic Management (CNS/ATM) program is a system of systems. The program will encompass the integration of various systems which will be procured utilizing existing contracts for integration on forward-fit and retrofit platforms to provide CNS/ATM functionality. Tactical Communications (TACCOM) is utilizing a firm fixed price contract to Rockwell Collins for research and development of the ARC-210 Gen 5/6 and other Navy contract vehicles for integration studies. The Navy will integrate systems and components to satisfy platform requirements to achieve tactical communication capability as determined by analyses. Ground Proximity Warning System/Terrain Awareness Warning System (GPWS/TAWS II) Software Modules will be developed by a Government Software Product Team in collaboration with Industry where required. Avionics Component Improvement Program (AvCIP) will annually review, compete and select candidate component improvement proposals according to urgency, criticality of warfighting contributions, technical risk, breadth of application, and scope of Return On Investment (ROI). Projects are selected by a panel of Avionics management experts, including representatives from OPNAV N98, NAVAIR, NAVICP, and the Fleet. Projects are executed by managers in platform or commodity offices that own the component. The AvCIP program management team manages project selection, allocates funds, monitors multiple project executions against proposed spend plans, and tracks solution performance and achievement of projected ROIs over time using Fleet maintenance and component performance databases. Cost avoidances are coordinated with OPNAV N98 to balance Flying Hour Program costs. Component improvement solutions include modular hardware, software and material upgrades. Resources cover engineering elements (including design and development, prototypes, platform integration, test and evaluation), program management and associated logistics elements (including technical data preparation, support equipment, provisioning, and training). Mid Air Collision Avoidance Capability (MCAC) is the capability umbrella which encompasses all systems designed and developed which aid in air-to-air collision avoidance. Systems include but are not limited to Traffic Collision Avoidance Systems and Mid Air Collision Avoidance Systems. MCAC Software Modules will be developed by a Government Software Product Team in collaboration with Industry where required. Avionics Architectures Team (AAT) will provide acquisition strategy guidance and support to platforms implementing open systems architectures to address open architecture requirements.

E. Performance Metrics

Joint Services Review Committee for Avionics (JSRC-AS) - Provide leadership in support of the Navy's interest to the JSRC tri-service committee promoting commonality and joint programs with focus on interoperability, communications, Communication Navigation Surveillance/Air Traffic Management (CNS/ATM), Joint Services avionics obsolescence
management and the update of the Core Avionics Master Plan. Support and participate in Naval Aviation Requirements Group panels, Operational Advisory Group, and Human Factors Quality Management Board.
Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) - Successfully complete platform integration, test, and certifications.
Tactical Communications (TACCOM) - Achieve Joint Interoperability Test Command and National Security Agency certifications on system developmental efforts to meet operational requirements.
Ground Proximity Warning System/Terrain Awareness Warning System (GPWS/TAWS II) - Develop algorithm and software to meet platform specific requirements, successfully complete flight test, and deliver product on schedule. Successfully complete Milestone C, and Fleet Release.
Collaborative Warfare (CW) - Identify collaborative warfighting capability gaps and ensure the development of the most intelligent, cost effective, and timely solutions to fill those gaps.
Avionics Component Improvement Program (AvCIP) - Successful project competition and selection, execution of allocated funds, fielding of solutions, and documentation of component performance enhancement and benefits.
Mid Air Collision Avoidance Capability (MCAC) - Achieve program acquisition milestones on cost and schedule meeting platform requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

Avionics Architectures Team (AAT) - Provide leadership in support of the Navy's interest to the Future Airborne Capability Environment (FACE) Consortium. Participate in technical and business working groups within the FACE Consortium to foster solutions that promote interoperable and integrated warfighting capability for all services. Successfully functionally decompose,prototype and demonstrate FACE conformant applications and FACE compatible operating environments. Develop technical specifications for Hardware Open System Technologies (HOST). Prototype and demonstrate HOST avionics components.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Dev CNS/ATM	SS/CPFF	Sikorsky : Stratford, CT	0.000	0.000		1.750	Dec 2017	0.000		-		0.000	0.000	1.750	1.750
Primary Hardware Dev	Various	Various : Various	0.000	2.999	Mar 2017	3.841	Jan 2018	5.504	Jan 2019	-		5.504	Continuing	Continuing	Continuing
Primary Hardware Dev GPWS/TAWS II	WR	NAWCAD : Patuxent River, MD	0.000	0.000	Jan 2017	1.359	Oct 2017	1.630	Dec 2018	-		1.630	Continuing	Continuing	Continuing
Aircraft Integration TACCOM	SS/FFP	Rockwell Collins : Cedar Rapids, IA	0.000	6.080	Nov 2016	8.453	May 2018	11.724	Jan 2019	-		11.724	0.000	26.257	26.257
Aircraft Integration GPWS/ TAWS II	SS/CPIF	Lockheed Martin : Owego, NY	0.000	0.000		2.936	Dec 2017	1.764	Dec 2018	-		1.764	0.000	4.700	4.700
Aircraft IntegrationTACCOM	C/CPFF	Rockwell Collins : Cedar Rapids, IA	0.000	4.291	Aug 2017	3.000	Nov 2017	0.000		-		0.000	0.000	7.291	7.291
Aircraft Integration	Various	Various : Various	0.000	0.159	Jul 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering AAT	MIPR	DTIC : Fort Belvior, VA	0.000	7.027	Jan 2017	7.144	Jan 2018	4.895	Jan 2019	-		4.895	Continuing	Continuing	Continuing
Systems Engineering TACCOM	WR	NAWCAD : Patuxent River, MD	0.000	2.083	Dec 2016	1.091	Dec 2017	1.022	Nov 2018	-		1.022	Continuing	Continuing	Continuing
Systems Engineering	Various	Various : Various	0.000	3.339	Mar 2017	2.802	Jan 2018	2.730	Dec 2018	-		2.730	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.100	Dec 2016	2.372	Dec 2017	2.215	Nov 2018	-		2.215	Continuing	Continuing	Continuing
Systems Engineering MCAC	WR	NAWCAD : Patuxent River, MD	0.000	1.396	Dec 2016	0.000		1.191	Dec 2018	-		1.191	Continuing	Continuing	Continuing
		Subtotal	0.000	27.474		34.748		32.675		-		32.675	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development TACCOM	SS/FFP	Rockwell : Cedar Rapids, IA	0.000	0.000		3.009	Mar 2018	3.021	Mar 2019	-		3.021	0.000	6.030	6.030
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.000	0.578	Mar 2017	1.188	Nov 2017	1.041	Nov 2018	-		1.041	Continuing	Continuing	Continuing
Software Development	Various	Various : Various	0.000	0.687	Nov 2016	0.000		0.000		-		0.000	0.000	0.687	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 0572 / *JT Service/NV Std Avionics CP/SB*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.000	1.265		4.197		4.062		-		4.062	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Evaluation	Various	Various : Various	0.000	1.519	Mar 2017	0.000		0.221	Mar 2019	-		0.221	Continuing	Continuing	Continuing
Developmental Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	1.429	Mar 2017	1.293	Nov 2017	1.775	Nov 2018	-		1.775	Continuing	Continuing	Continuing
		Subtotal	0.000	2.948		1.293		1.996		-		1.996	Continuing	Continuing	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	0.000	3.801	Apr 2017	3.311	Jan 2018	2.879	Jan 2019	-		2.879	Continuing	Continuing	Continuing
Contactor Engineering Support TACCOM	C/CPFF	Precise : Lexington Park, MD	0.000	1.329	Dec 2016	1.737	Dec 2017	1.812	Dec 2018	-		1.812	0.000	4.878	4.958
Contractor Engineering Support AAT	C/CPFF	Precise : Lexington Park, MD	0.000	1.533	Dec 2016	1.889	Dec 2017	2.025	Dec 2018	-		2.025	0.000	5.447	5.739
Government Engineering Support	WR	NAWCAD : Patuxent River, MD	0.000	0.331	Mar 2017	0.807	Nov 2017	0.466	Nov 2018	-		0.466	Continuing	Continuing	Continuing
Government Engineering Support AAT	WR	NAWCAD : Patuxent River, MD	0.000	1.776	Dec 2016	2.467	Dec 2017	2.641	Dec 2018	-		2.641	0.000	6.884	-
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.000	2.146	Mar 2017	2.942	Nov 2017	2.844	Nov 2018	-		2.844	Continuing	Continuing	Continuing
Program Management Support	Various	Various : Various	0.000	0.052	Dec 2017	0.036	Jan 2018	0.035	Jan 2019	-		0.035	Continuing	Continuing	Continuing
Travel	WR	NAVAIR : Patuxent River, MD	0.000	0.056	Dec 2016	0.085	Feb 2018	0.051	Feb 2019	-		0.051	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 0572 / *JT Service/NV Std Avionics CP/SB*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.000	11.024		13.274		12.753		-		12.753	Continuing	Continuing	N/A

Remarks

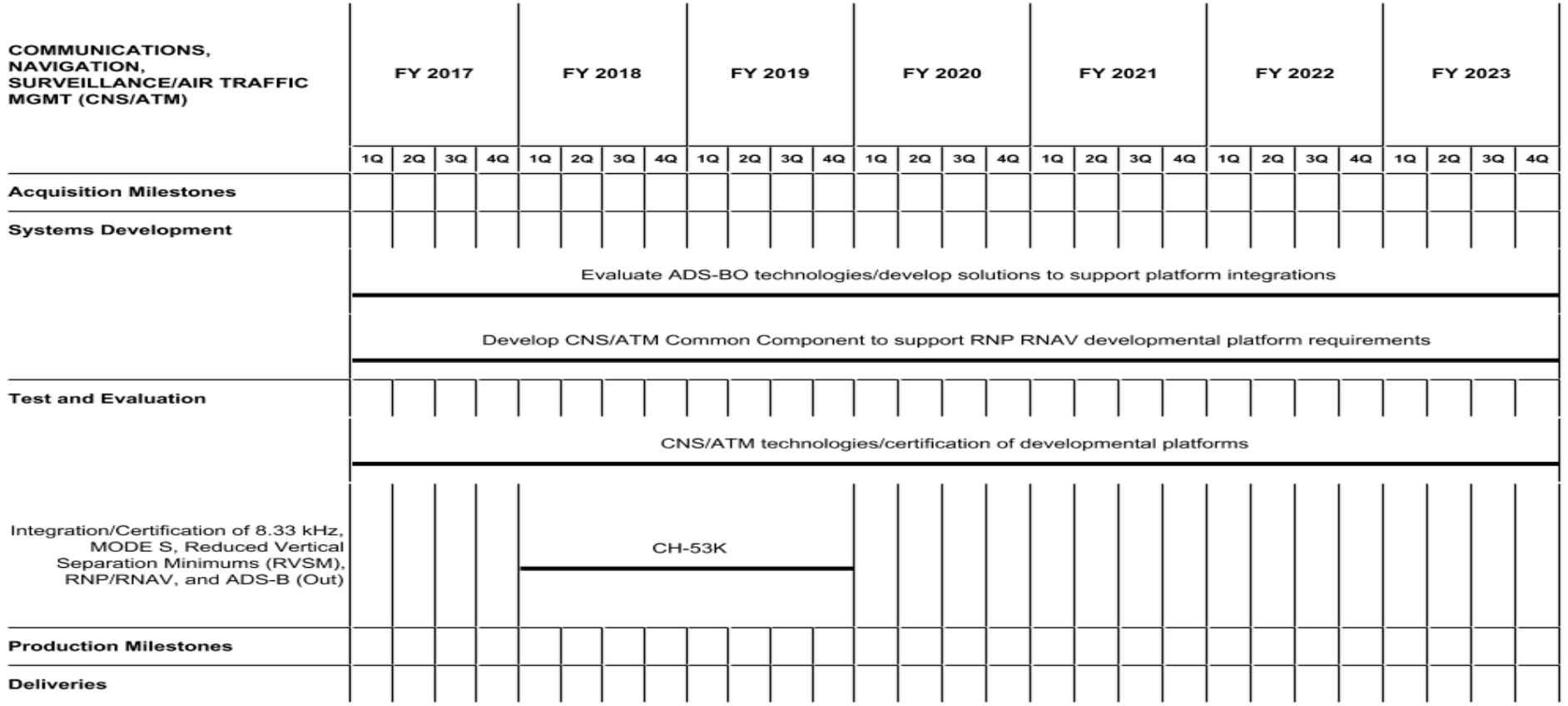
CES - TAWS II is going through a software re-architecture to meet MLSTD 882-E Level I. TAWS II V-22 effort starting system safety functional hazard assessment in FY18.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	42.711		53.512		51.486		-		51.486	Continuing	Continuing	N/A

Remarks

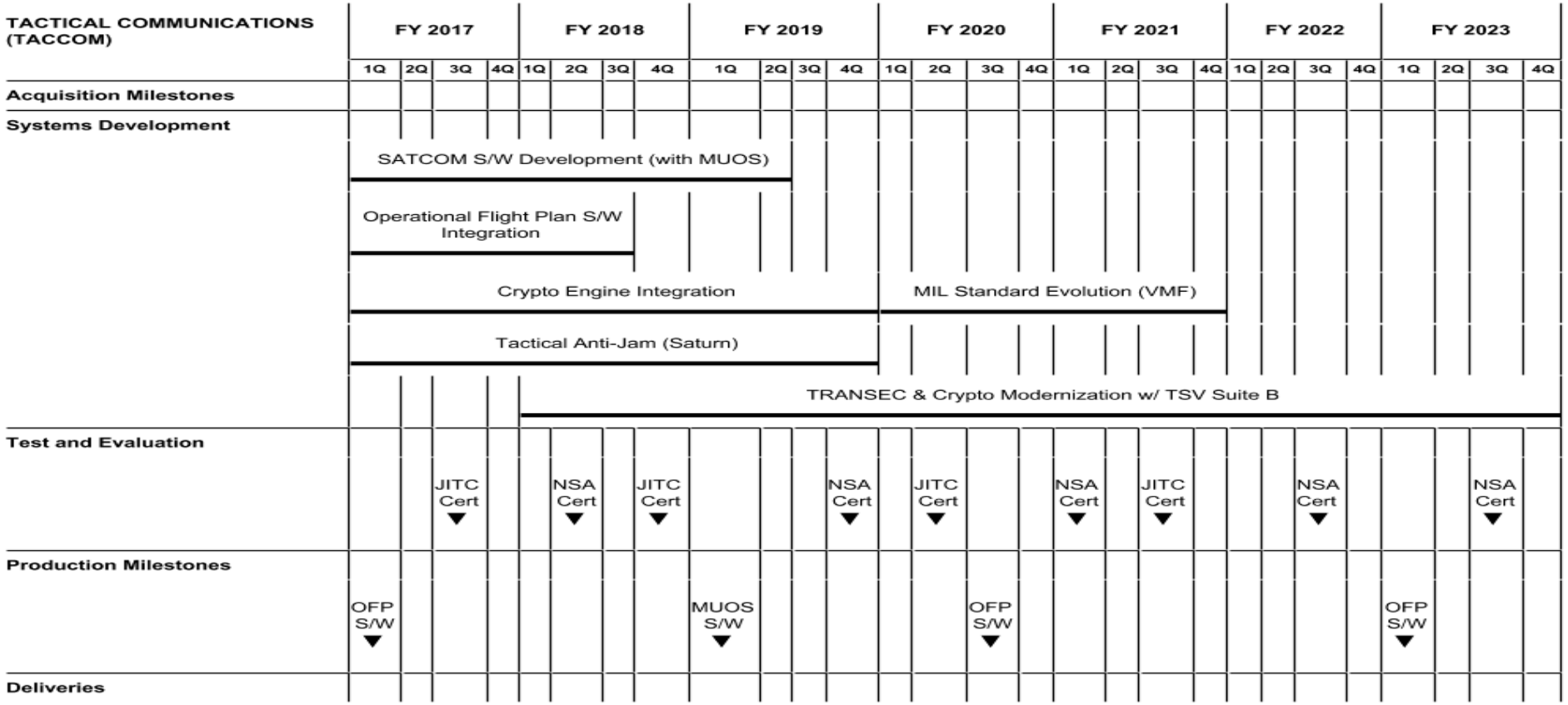
(U) Common Avionics schedule FY16 and prior is reflected in PE 0604215N, Project Unit 0572.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2019DON - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2019DON - 0605217N - 0572

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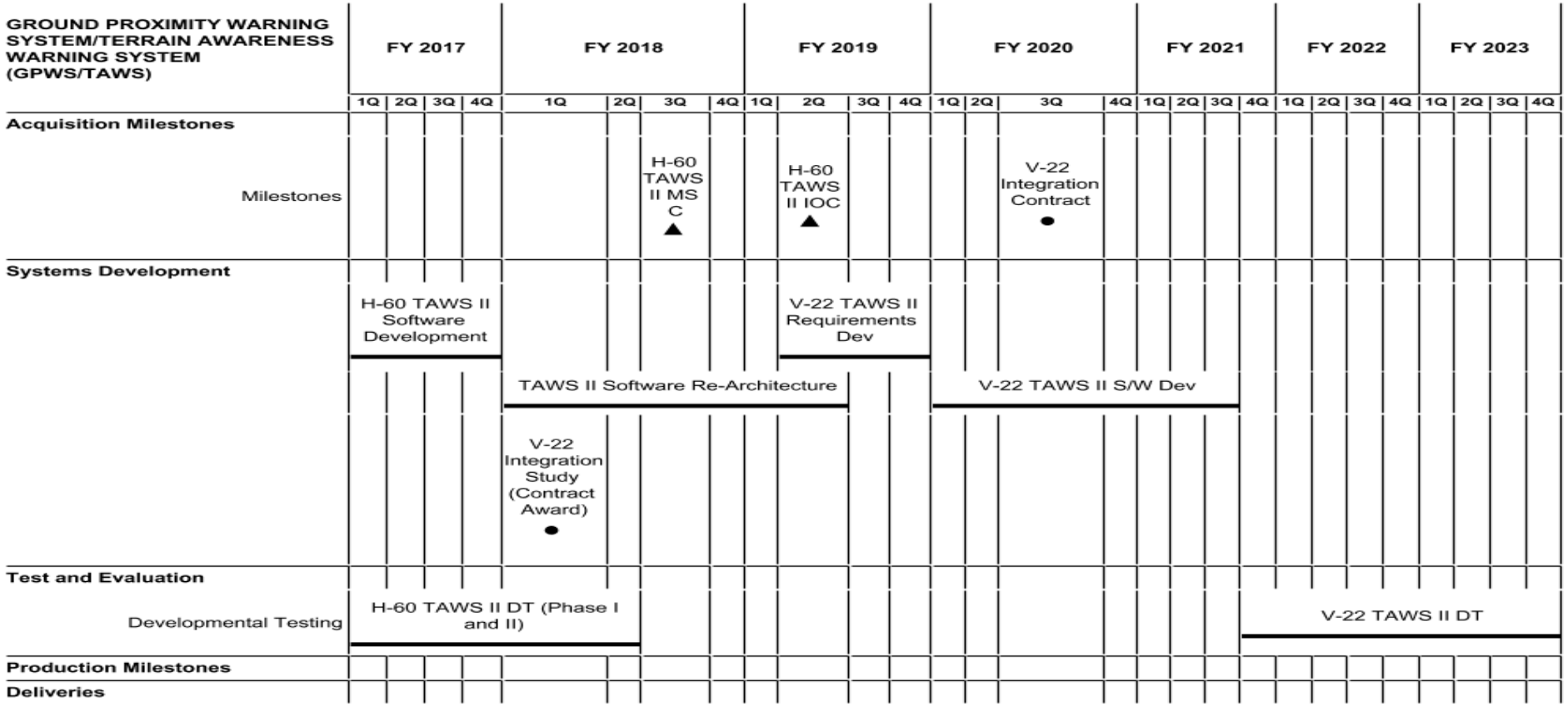
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2019DON - 0605217N - 0572

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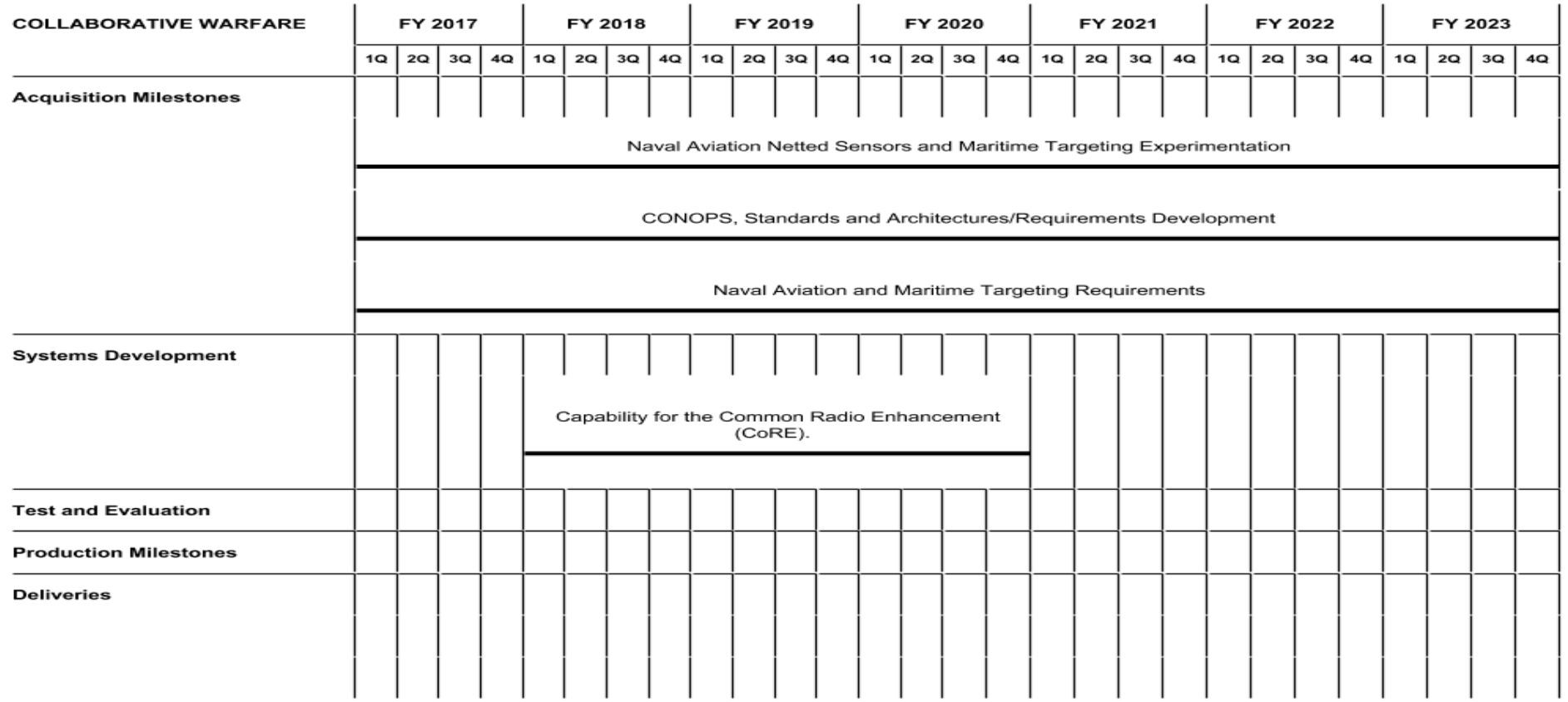
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2019DON - 0605217N - 0572

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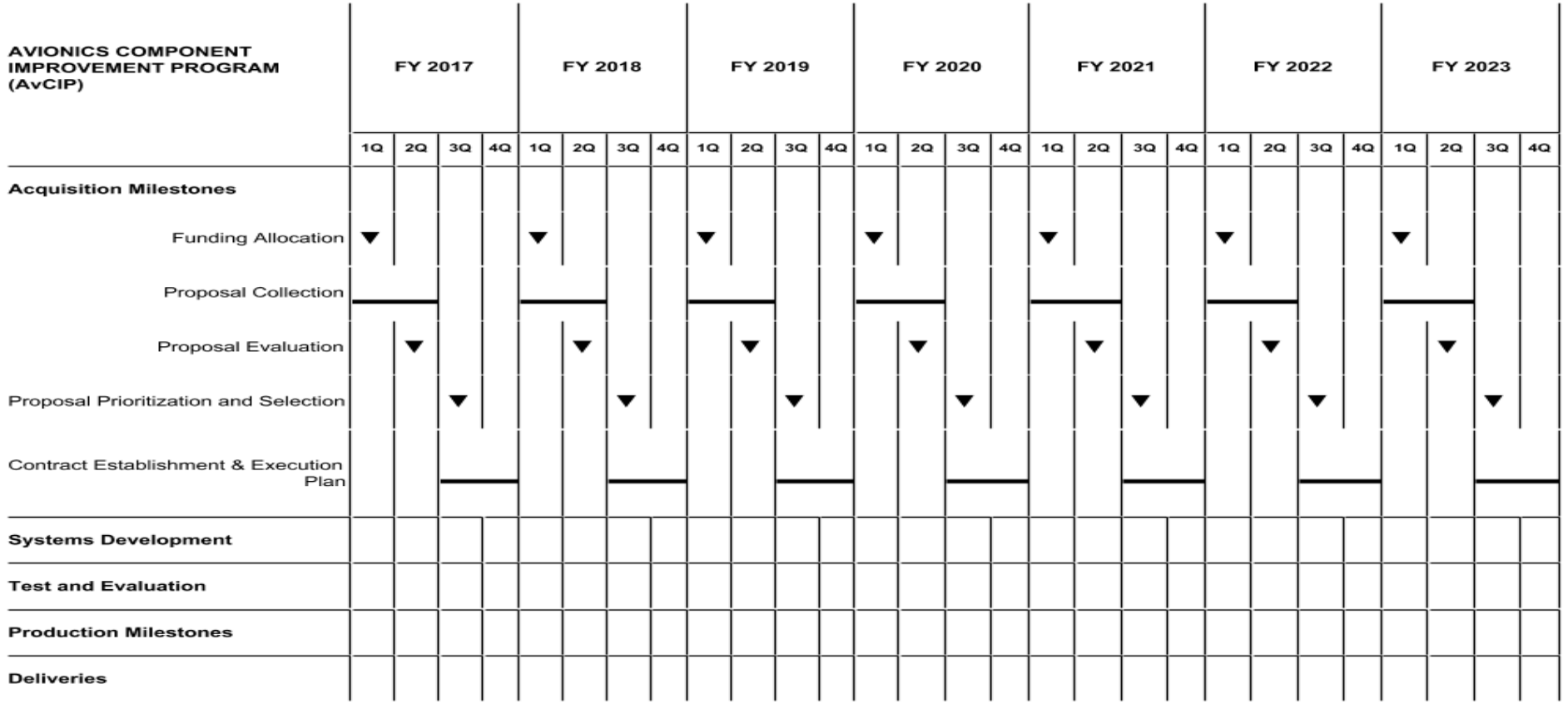
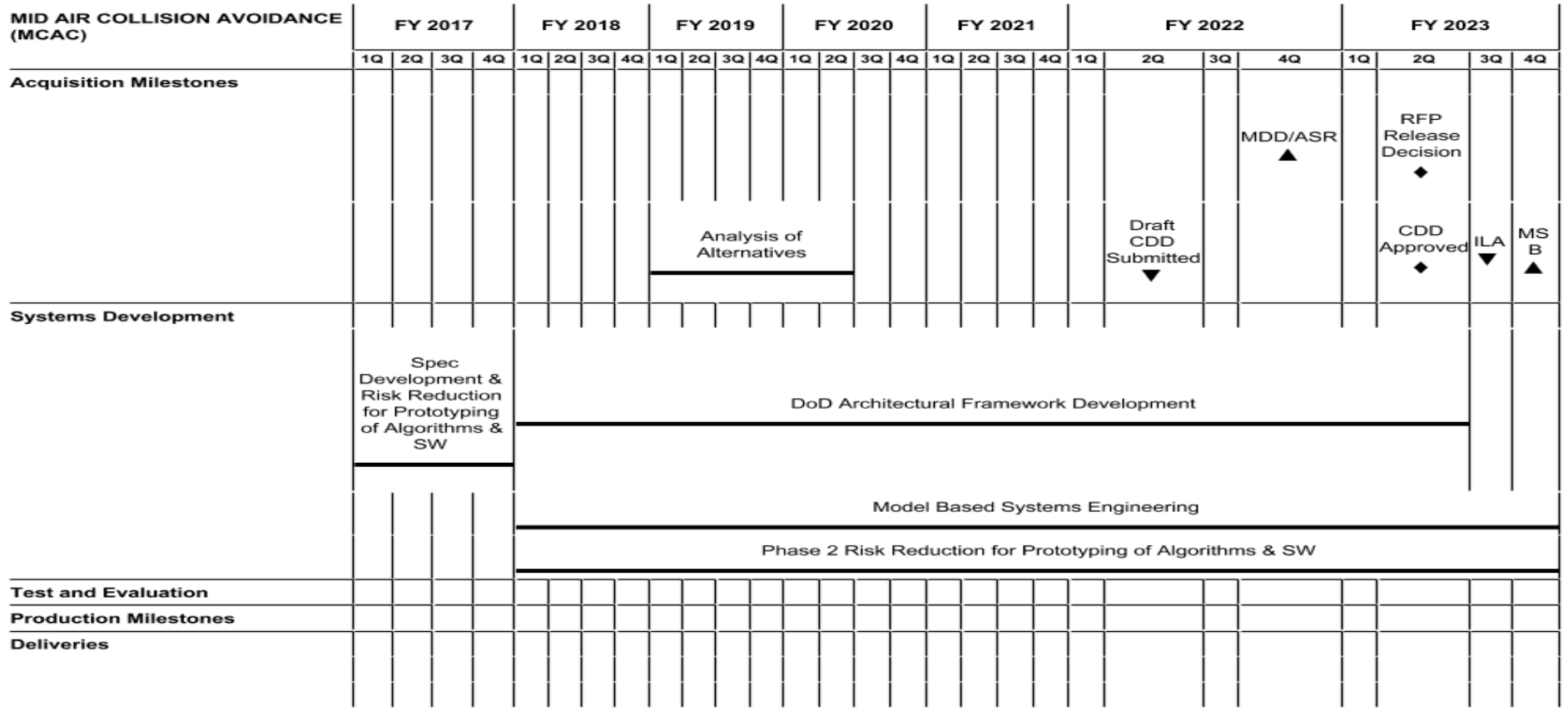
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2019DON - 0605217N - 0572

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*



2019DON - 0605217N - 0572

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
COMMUNICATIONS, NAVIGATION, SURVEILLANCE/AIR TRAFFIC MGMT (CNS/ ATM)				
Systems Development: Evaluate ADS-B (Out) technologies/develop solutions to support platform integrations	1	2017	4	2023
Systems Development: Develop CNS/ATM Common Component to support RNP RNAV developmental platform requirements	1	2017	4	2023
Test and Evaluation: CNS/ATM technologies/certification of developmental platforms	1	2017	4	2023
Test and Evaluation: Integration/Certification of 8.33 kHz, MODE S, Reduced Vertical Separation Minimums (RVSM), RNP/RNAV, and ADS-B (Out): for CH-53K	1	2018	4	2019
TACTICAL COMMUNICATIONS (TACCOM)				
Systems Development: GEN5 Integrated Waveform Satellite Communications (SATCOM) S/W Development	1	2017	2	2019
Systems Development: Operational Flight Plan	1	2017	3	2018
Systems Development: Crypto Engine Integration	1	2017	4	2019
Systems Development: MIL Standard Evolution (VMF)	1	2020	4	2021
Systems Development: Tactical Anti-Jam (Saturn)	1	2017	4	2019
Systems Development: Transmission Security (TRANSEC) & Crypto Modernization w/ Tactical Secure Voice (TSV) Suite B	1	2018	4	2023
Test and Evaluation: NSA Cert 1	1	2021	1	2021
Test and Evaluation: JITC Cert 1	3	2017	3	2017
Test and Evaluation: NSA Cert 2	2	2018	2	2018
Test and Evaluation: JITC Cert 2	4	2018	4	2018
Test and Evaluation: NSA Cert 3	4	2019	4	2019
Test and Evaluation: JITC Cert 3	2	2020	2	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test and Evaluation: JITC Cert 4	3	2021	3	2021
Test and Evaluation: NSA Cert 4	3	2022	3	2022
Test and Evaluation: NSA Cert 5	3	2023	3	2023
Production Milestones: OFP S/W 1	1	2017	1	2017
Production Milestones: MUOS S/W	1	2019	1	2019
Production Milestones: OFP S/W 2	3	2020	3	2020
Production Milestones: OFP S/W 3	1	2023	1	2023
GROUND PROXIMITY WARNING SYSTEM/TERRAIN AWARENESS WARNING SYSTEM (GPWS/TAWS)				
Acquisition Milestones: Milestones: H-60 TAWS II MS C	3	2018	3	2018
Acquisition Milestones: Milestones: H-60 TAWS II IOC	2	2019	2	2019
Acquisition Milestones: Milestones: V-22 Integration Contract	3	2020	3	2020
Systems Development: H-60 TAWS II Software Development	1	2017	4	2017
Systems Development: V-22 TAWS II Requirements Development	2	2019	4	2019
Systems Development: TAWS II Software Re-Architecture	1	2018	2	2019
Systems Development: V-22 TAWS II Software Development	1	2020	3	2021
Systems Development: V-22 CFIT Integration Study	1	2018	1	2018
Test and Evaluation: Developmental Testing: H-60 TAWS II DT (Phase I and II)	1	2017	2	2018
Test and Evaluation: Developmental Testing: V-22 TAWS II DT	4	2021	4	2023
COLLABORATIVE WARFARE				
Acquisition Milestones: Naval Aviation Netted Sensors and Maritime Targeting Experimentation	1	2017	4	2023
Acquisition Milestones: Netted Sensors CONOPS, Standards and Architectures/ Requirements Development	1	2017	4	2023
Acquisition Milestones: Naval Aviation and Maritime Targeting Requirements	1	2017	4	2023
Systems Development: Capability for the Common Radio Enhancement (CoRE)	1	2018	4	2020
AVIONICS COMPONENT IMPROVEMENT PROGRAM (AvCIP)				

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Funding Allocation: Funding Allocation1	1	2017	1	2017
Acquisition Milestones: Funding Allocation: Funding Allocation2	1	2018	1	2018
Acquisition Milestones: Funding Allocation: Funding Allocation3	1	2019	1	2019
Acquisition Milestones: Funding Allocation: Funding Allocation4	1	2020	1	2020
Acquisition Milestones: Funding Allocation: Funding Allocation5	1	2021	1	2021
Acquisition Milestones: Funding Allocation: Funding Allocation6	1	2022	1	2022
Acquisition Milestones: Funding Allocation: Funding Allocation7	1	2023	1	2023
Acquisition Milestones: Proposal Collection: Proposal Collection1	1	2017	2	2017
Acquisition Milestones: Proposal Collection: Proposal Collection2	1	2018	2	2018
Acquisition Milestones: Proposal Collection: Proposal Collection3	1	2019	2	2019
Acquisition Milestones: Proposal Collection: Proposal Collection4	1	2020	2	2020
Acquisition Milestones: Proposal Collection: Proposal Collection5	1	2021	2	2021
Acquisition Milestones: Proposal Collection: Proposal Collection6	1	2022	2	2022
Acquisition Milestones: Proposal Collection: Proposal Collection7	1	2023	2	2023
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation1	2	2017	2	2017
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation2	2	2018	2	2018
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation3	2	2019	2	2019
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation4	2	2020	2	2020
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation5	2	2021	2	2021
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation6	2	2022	2	2022
Acquisition Milestones: Proposal Evaluation: Proposal Evaluation7	2	2023	2	2023
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection1	3	2017	3	2017
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection2	3	2018	3	2018
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection3	3	2019	3	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection4	3	2020	3	2020
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection5	3	2021	3	2021
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection6	3	2022	3	2022
Acquisition Milestones: Proposal Prioritization and Selection: Proposal Prioritization and Selection7	3	2023	3	2023
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan1	3	2017	4	2017
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan2	3	2018	4	2018
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan3	3	2019	4	2019
Acquisition Milestones: Contract Establishment & Execution Plan: Contract Establishment & Execution Plan4	3	2020	4	2020
Acquisition Milestones: Contract Establishment & Execution Plan: Conract Establishment & Execution Plan5	3	2021	4	2021
Acquisition Milestones: Contract Establishment & Execution Plan: Conract Establishment & Execution Plan6	3	2022	4	2022
Acquisition Milestones: Contract Establishment & Execution Plan: Conract Establishment & Execution Plan7	3	2023	4	2023
MID AIR COLLISION AVOIDANCE (MCAC)				
Acquisition Milestones: MDD/ASR	4	2022	4	2022
Acquisition Milestones: RFP Release Decision	2	2023	2	2023
Acquisition Milestones: CDD Approved	2	2023	2	2023
Acquisition Milestones: Integrated Logistics Assessment	3	2023	3	2023
Acquisition Milestones: MS B	4	2023	4	2023
Acquisition Milestones: Draft CDD Submitted	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 0572 / *JT Service/NV Std Avionics CP/SB*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Milestones: Analysis of Alternatives	1	2019	2	2020
Systems Development: Spec Development & Risk Reduction for Prototyping of Algorithms & SW	1	2017	4	2017
Systems Development: DoD Architectural Framework Development	1	2018	2	2023
Systems Development: Model Based Systems Engineering	1	2018	4	2023
Systems Development: Phase 2 Risk Reduction for Prototyping of Algorithms & SW	1	2018	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 3425 / *Digital Warfare*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3425: *Digital Warfare*	0.000	0.000	4.651	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.651
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Chief of Naval Operations concurred with the Task Force Netted Navy recommendation to stand up the Digital Warfare (DW) project to set requirements, prioritize resources, and lead efforts on information interoperability and human/machine teaming.

NAVAIR, NAVSEA, SPAWAR, associated Program Executive Offices, warfare and system centers and University Affiliated Research Centers/Federally Funded Research and Development Centers will support the Model Based Engineering, Technical Design, and Requirements branches in the new Digital Warfare effort under OPNAV N2N6. In order to develop capability from the top down, the Digital Warfare will develop requirements for the system of systems to include all of the associated interoperability requirements. Due to the complexity of this work, Digital Warfare will evolve the traditional requirements development methodology to a model based systems engineering environment that will include associated model extensions, reports, views, configuration management, help desk support, and documentation. This work will be completed by a series of teams, each focused on a separate threat domain, and made up of system modelers, fleet representatives, program of record representatives, architecture and interoperability experts, etc. The products generated by these teams will include data technical baselines for domain areas with individual profiles for each program of record, coordinated requirements recommendations, and potential areas for S&T and experimentation to fill gaps. Digital Warfare will also explore emerging digital technologies including human/machine teaming.

Each SYSCOM will be involved in creating Data Technical Baseline (DTB) profiles specific for each program of record. DTBs may consist of interfaces, protocols, content, information quality, architectural aspects, and knowledge base frameworks. SYSCOMs will exercise technical authority to assess Program of Record compliance to DTBs and Key Performance Parameters in support of gate reviews and system engineering technical reviews.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: DIGITAL WARFARE	0.000	4.651	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Provide Subject Matter Expert (SME) support for the domain functional decomposition based on prioritized mission areas. Support the analytical agenda from OPNAV N81 and N9I for the specific mission area capabilities. Provide modeling and documentation support for Joint Capability Integration Development System (JCIDS), OPNAV Program Objective Memorandum (POM) process, and ASN (RD&A) Acquisition Process. Coordinate and work across the SYSCOMs and PEOs on the OPNAV Model Based Systems Engineering (MBSE) requirements allocation process.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 3425 / *Digital Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Participate in the definition of MBSE tool functionality and views based on Echelon I stakeholder requirements. Collaboratively develop tool extensions to complement JCIDS and POM processes. Support development of cross-SYSCOM Modeling Standards and Policies for Science and Technology and Program of Records. Create models in the modeling environment. Provide SME support for data science teams in data exploration and analysis, information and knowledge extraction techniques, and application to mission area data requirements. Provide engineering inputs to and review Navy Integrated Capability Concepts for data architecture consistencies. Explore Machine Learning techniques to support human/machine teaming for decision making. Develop an overarching Data Technical Baseline (DTB) and DTB profiles for Program of Records (POR) under SYSCOM cognizance. Assess PORs against their DTB profile during all Systems Engineering Technical Review events and gate reviews. Provide common infrastructure for MBSE and DTB environments, to include access management, configuration management, and help desk support. ***FY 2019 Base Plans:*** Digital Warfare efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 2018 to FY 2019 reflects Digital Warfare standing up as a separate Program Element. Digital Warfare efforts in FY19 and out have been consolidated and realigned into PE 0604027N Digital Warfare.					
Accomplishments/Planned Programs Subtotals	0.000	4.651	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Procurement strategy is determined by market survey and cooperative opportunities.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 3425 / *Digital Warfare*

E. Performance Metrics

Digital Warfare will set requirements, prioritize resources, and lead efforts on information interoperability and human/machine teaming. This will result in a workforce that is trained in new systems engineering and modeling concepts and tools. It will also result in development of a requirements modeling environment to include associated model extensions, reports, views, and configuration management and in the development of digital technical baselines for programs to use to ensure cross-domain interoperability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605217N / *(U)Common Avionics*	Project (Number/Name) 3425 / *Digital Warfare*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Warfare Office Support	WR	Naval Air War : Patuxent River, MD	0.000	0.000		1.201	Oct 2017	0.000		-		0.000	0.000	1.201	-
		Subtotal	0.000	0.000		1.201		0.000		-		0.000	0.000	1.201	N/A

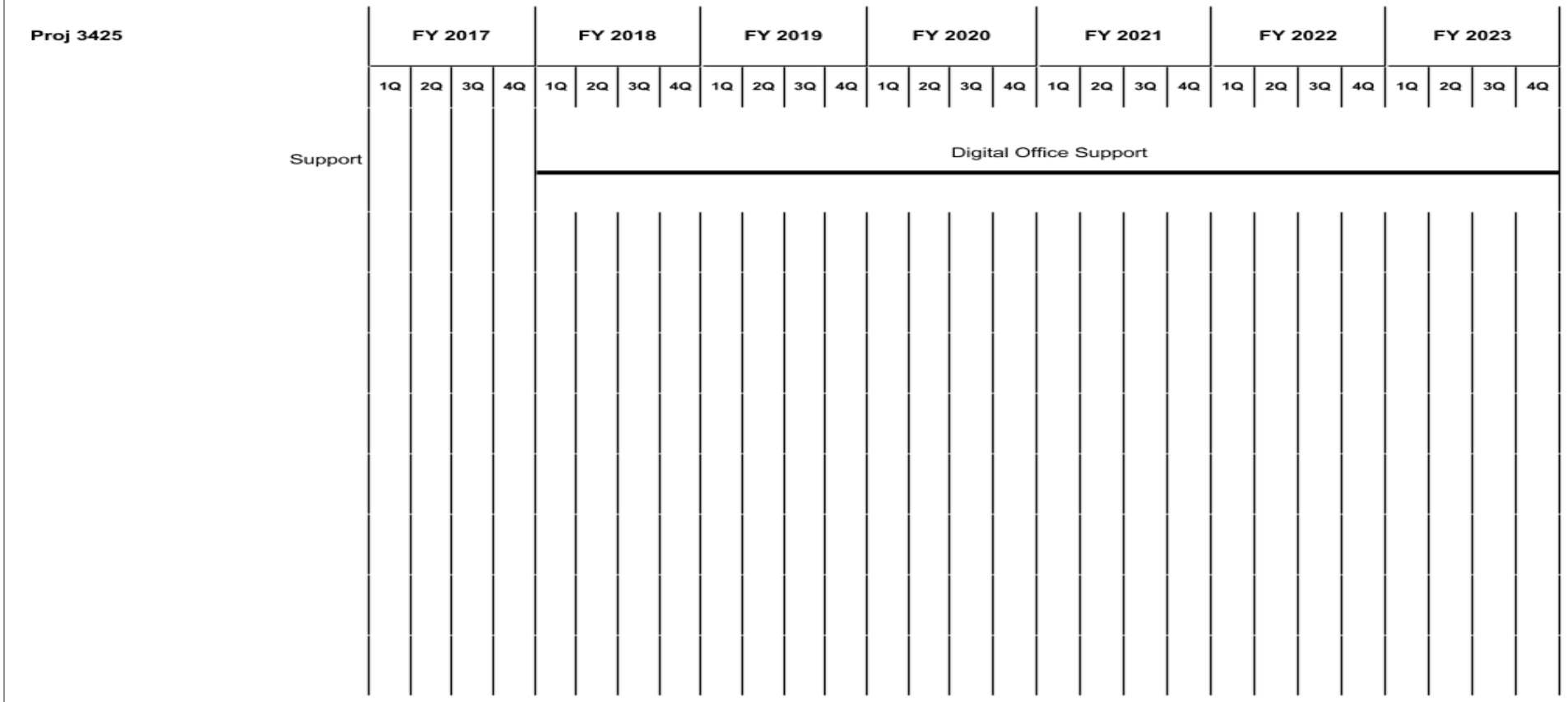
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Engineer Support	Various	Various : Various	0.000	0.000		3.450	Dec 2017	0.000		-		0.000	0.000	3.450	-
		Subtotal	0.000	0.000		3.450		0.000		-		0.000	0.000	3.450	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		4.651		0.000		-		0.000	0.000	4.651	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 3425 / *Digital Warfare*



2019PB - 0605217N - 3425

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605217N / *(U)Common Avionics*	**Project (Number/Name)** 3425 / *Digital Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3425				
Support: DWO Support	1	2018	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605220N *I (U)Ship to Shore Connector (SSC)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	353.530	12.588	22.410	1.444	-	1.444	2.089	0.000	0.000	0.000	0.000	392.061
3133: *Ship to Shore Connectors Contract Design*	4.144	4.065	9.003	1.106	-	1.106	2.089	0.000	0.000	0.000	0.000	20.407
3137: *SSC Construction*	349.386	8.523	13.407	0.338	-	0.338	0.000	0.000	0.000	0.000	0.000	371.654
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 303												

A. Mission Description and Budget Item Justification

Note: This effort was previously funded under PE 0604567N under projects 3133 and 3137 (FY 2014 and prior).

This PE directly funds and supports the detail design, development, construction, issue resolution, certification, integration and testing of the Ship to Shore Connector (SSC). The lead craft (Craft 100) will be maintained as a test and training platform throughout its life cycle.

SSC is an air-cushioned landing craft intended to transport personnel, weapon systems, equipment, and cargo from amphibious vessels to shore in assault and non-assault operations. The SSC program provides the capability to rapidly move assault forces within the littoral operational environment to accomplish Unified Command Plan (UCP) missions and ensures the Joint Force Commander's (JFCDR's) ability to conduct amphibious operations and operate over the high water mark, including movement over ice, mud, rivers, swamps and marshes. The SSC program provides the functional replacement for the LCAC craft, including Service Life Extension Program(SLEP) which began to degrade below the Required Operational Capability/Projected Operational Environment (ROC/POE) requirement beginning in 2015. SSC addresses this capability gap.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	11.088	22.410	1.494	-	1.494
Current President's Budget	12.588	22.410	1.444	-	1.444
Total Adjustments	1.500	0.000	-0.050	-	-0.050
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.500	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.050	-	-0.050

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605220N *I (U)Ship to Shore Connector (SSC)*

Change Summary Explanation

Added additional FY 17 funds for critical engineering change proposal associated with the command, control, communications, computers and navigation (C4N) system.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605220N / *(U)Ship to Shore Connector (SSC)*	Project (Number/Name) 3133 / *Ship to Shore Connectors Contract Design*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3133: *Ship to Shore Connectors Contract Design*	4.144	4.065	9.003	1.106	-	1.106	2.089	0.000	0.000	0.000	0.000	20.407
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 303

A. Mission Description and Budget Item Justification

Ship to Shore Connector (SSC) - This project provides the Preliminary and Contract design and Class test efforts for the SSC Program. The SSC program provides the capability to rapidly move assault forces within the littoral operational environment to accomplish Unified Command Plan (UCP) missions and ensures the Joint Force Commander's (JFCDR's) ability to conduct amphibious operations and operate over the high water mark, including movement over ice, mud, rivers, swamps and marshes. SSC provides the functional replacement for the LCAC craft, which begin reaching end of extended service life in 2015. For FY15 and beyond, this project will provide for Class Test and Evaluation of components and systems, as well as all programmatic effort and support activities necessary for the development and execution of Class T&E plans and programs.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Ship to Shore Connectors Contract Design	4.065	9.003	1.106	0.000	1.106
Articles:	-	-	-	-	-
FY 2018 Plans: Continue Class T&E Program and commence execution of Post Delivery Test & Trials (PDT&T) on CRAFT 100, including Integrated Developmental Test/Operational Test and LFT&E to support VAR II. Post Delivery Test & Trials (PDT&T) will consist of planning and execution of 27 test events to validate first of class certification and performance requirements, characterize the craft operational envelope, provide confidence to certify the craft readiness for IOT&E, and to verify SSC production and performance to support an Full Rate Production Decision (FRPD). PDT&T tests will support the reliability growth program by conducting 240 hours of on-cushion operations and providing craft level failure data for use with the reliability growth model. The initiation of integrated Developmental and Operational Test and the continuation of LFT&E Events will support DOT&E's recommendation for Full Rate Production.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605220N / *(U)Ship to Shore Connector (SSC)*	**Project (Number/Name)** 3133 / *Ship to Shore Connectors Contract Design*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue Class T&E Program and conclude execution of PDT&T, integrated Developmental and Operational Test and LFT&E Events . Finalize preparation for Initial Operational Test & Evaluation to support DOT&E's recommendation for Full Rate Production. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to planned phasing of testing events.					
Accomplishments/Planned Programs Subtotals	4.065	9.003	1.106	0.000	1.106

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTEN 3137: *SSC Construction*	8.523	13.407	0.338	-	0.338	0.000	0.000	0.000	0.000	0.000	371.125
• SCN 5112: *Ship to Shore Connector*	128.067	217.654	334.775	-	334.775	507.903	504.691	523.312	472.608	1,633.776	4,716.716

Remarks

D. Acquisition Strategy

The Test and Training craft (Craft 100) and Craft 101 have been executed on contract. Craft 100 will be procured and constructed with RDTEN. LCAC 101 was awarded with RDTEN and transferred to SCN for completion. The Detail Design and Construction contract includes options for construction of an additional seven SCN craft, all of which have been awarded (LCAC 102-108). Detail Design and Construction contract for LCAC 102-108 ends in FY16. Crafts authorized for FY17-19 will be awarded on a new contract.

E. Performance Metrics

Continue Operation Testing (Phases C and D)
Continue Follow on SCN Craft Production Testing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605220N / *(U)Ship to Shore Connector (SSC)*	Project (Number/Name) 3133 / *Ship to Shore Connectors Contract Design*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Post Delivery Test & Trials	Various	NSWC PCD : Various	0.000	1.000	Sep 2017	5.300	Apr 2018	0.823	Oct 2018	-		0.823	0.000	7.123	-
Developmental Test & Evaluation	Various	SUPSHIP/ TEXTRON : Various	0.624	0.000		0.600	Apr 2018	0.000		-		0.000	0.000	1.224	Continuing
Operational Test & Evaluation	Various	Various : Various	1.767	1.531	Sep 2017	1.544	May 2018	0.283	Jul 2019	-		0.283	0.000	5.125	Continuing
Live Fire Test & Evaluation	Various	Various : Various	1.753	1.534	Sep 2017	1.559	May 2018	0.000		-		0.000	0.000	4.846	Continuing
		Subtotal	4.144	4.065		9.003		1.106		-		1.106	0.000	18.318	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.144	4.065		9.003		1.106		-		1.106	0.000	18.318	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605220N / *(U)Ship to Shore Connector (SSC)*	**Project (Number/Name)** 3133 / *Ship to Shore Connectors Contract Design*

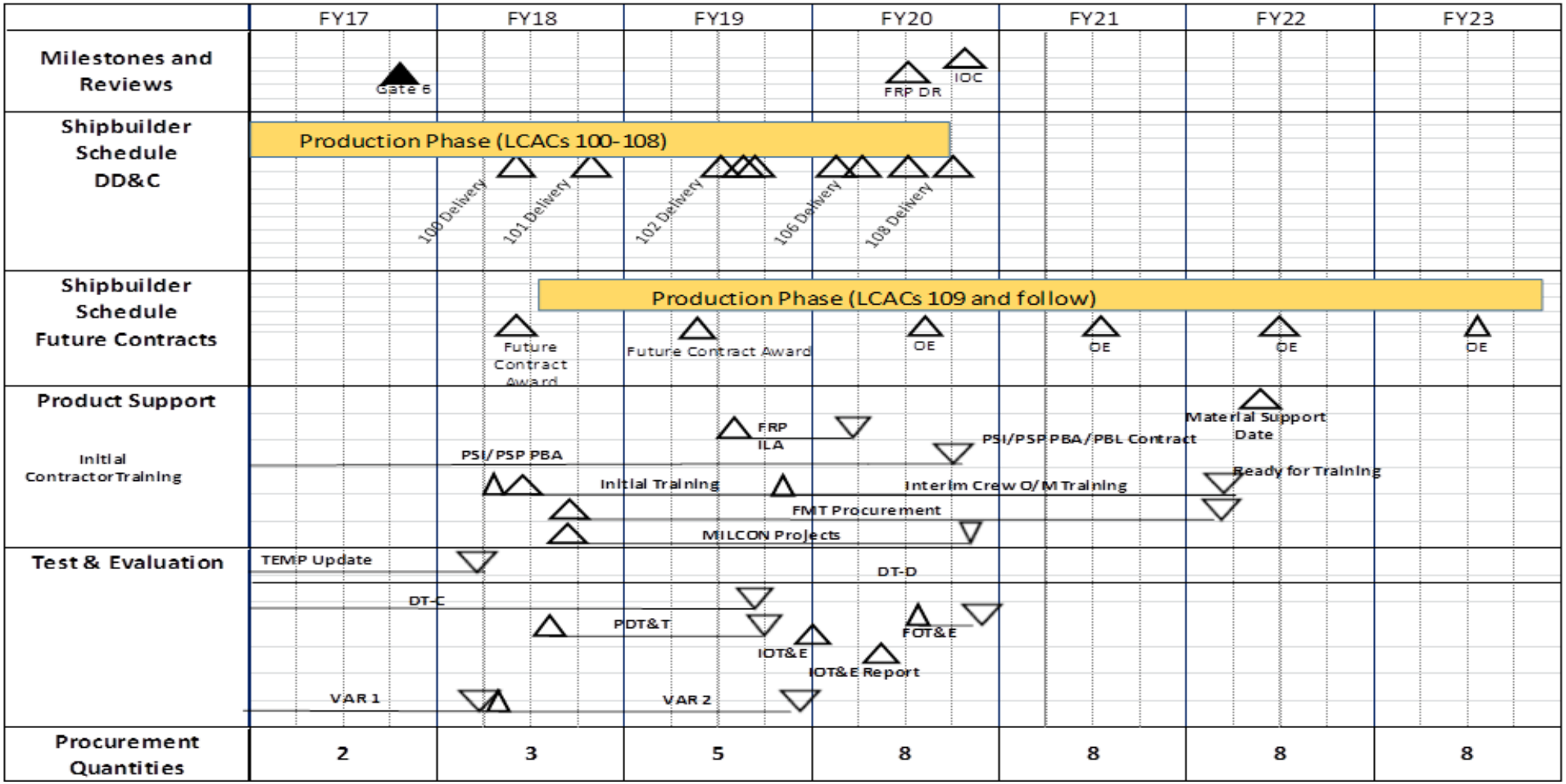


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605220N / *(U)Ship to Shore Connector (SSC)*	**Project (Number/Name)** 3133 / *Ship to Shore Connectors Contract Design*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3133				
Post Delivery Test & Trials (PDT&T)	3	2018	4	2019
Initial Operational Test and Evaluation (IOT&E)	4	2019	1	2020
Full Rate Production (FRP) Program Review (PR)	3	2020	3	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0605220N / *(U)Ship to Shore Connector (SSC)*				Project (Number/Name) 3137 / *SSC Construction*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
3137: *SSC Construction*	349.386	8.523	13.407	0.338	-	0.338	0.000	0.000	0.000	0.000	0.000	371.654
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 303

A. Mission Description and Budget Item Justification

This project funds the Ship to Shore Connector (SSC) Engineering & Manufacturing Development phase which includes Detail Design and Construction, Product Support, Government Furnished Equipment (GFE), Program support, and Outfitting and Post Delivery. The lead craft will be maintained as a test and training platform throughout its life cycle. The SSC program provides the capability to rapidly move assault forces within the littoral operational environment to accomplish Unified Command Plan (UCP) missions, and ensures the Joint Force Commander's (JFCDR's) ability to conduct amphibious operations and operate over the high water mark, including movement over ice, mud, rivers, swamps and marshes. The SSC program provides the functional replacement for the LCAC craft, which began reaching end of extended service life in 2015. Funding for this effort was previously executed under PE 0604567N.

TEST AND TRAINING CRAFT 100 (in $ million):

Plans/Basic Construction:.....255.476 - (FY19 0.000)
Change Orders:.....13.618 - (FY19 0.000)
Electronic:.....8.407 - (FY19 0.000)
HM&E:.....29.823 - (FY19 0.000)
Other Support:.....36.623 - (FY19 0.338)
Ordnance:.....0.008 - (FY19 0.000)
Post Delivery/Outfitting:.....4.000 - (FY19 0.000)
Total:.....347.955 - (FY19 0.338)

NOTE - The SSC Construction project unit prior year column (FY11-15) total funding is $343.278 million for the SSC program. In the prior years FY11-14, the program was funded in PE 0604567N Ship Contract Design/Live Fire T&E. Funds breakout is as follows:

LCAC 100
PE 0604567N 279.863 million FY11-14
PE 0605220N 39.715 million FY15

LCAC 101
PE 0604567N 23.700 million FY13-14

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605220N / *(U)Ship to Shore Connector (SSC)*	**Project (Number/Name)** 3137 / *SSC Construction*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: SSC Construction	8.523	13.407	0.338	0.000	0.338
Articles:	-	-	-	-	-
FY 2018 Plans: Deliver craft 100. Continue Production Support and Test & Evaluation efforts. Begin Post Delivery Test and Trials (PDT&T) for craft 100.					
FY 2019 Base Plans: Complete Post Delivery Test and Trials (PDT&T)and associated tasking for CRAFT 100.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease reflects construction phasing of Craft 100.					
Accomplishments/Planned Programs Subtotals	8.523	13.407	0.338	0.000	0.338

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDTEN 3133: *Ship to Shore Connectors Contract Design*	4.065	9.003	1.106	-	1.106	2.089	0.000	0.000	0.000	0.000	20.407
• SCN 5112: *Ship to Shore Connector*	128.067	217.654	334.775	-	334.775	507.903	504.691	523.312	472.608	1,633.776	4,716.716

Remarks

D. Acquisition Strategy

The Test and Training craft (Craft 100) and Craft 101 have been executed on contract. Craft 100 will be procured and constructed with RDTEN. LCAC 101 was awarded with RDTEN and transferred to SCN for completion. The Detail Design and Construction contract includes options for construction of an additional seven SCN craft, all of which have been awarded (LCAC 102-108). Detailed Design and Construction contract for LCAC 102-108 ends in FY16. Crafts authorized for FY17-19 will be awarded on a new contract.

E. Performance Metrics

Deliver Test and Training Craft 100.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605220N / *(U)Ship to Shore Connector (SSC)*	Project (Number/Name) 3137 / *SSC Construction*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Trng Craft Ship Design	C/CPFF	Various : Various	3.070	0.734	Jul 2017	0.000		0.000		-		0.000	0.000	3.804	-
Test & Trng Craft Detail Design/Construction	C/FPIF	Textron : New Orleans, LA	28.305	2.407	Jul 2017	5.493	Apr 2018	0.000		-		0.000	0.000	36.205	-
Test & Trng Craft Government Furnished Equipment (GFE)	Various	Various : Various	0.210	0.050	Oct 2016	0.000		0.000		-		0.000	0.000	0.260	-
Test & Trng Craft Change Orders	C/FPIF	Textron : New Orleans, LA	7.822	0.000		0.000		0.000		-		0.000	0.000	7.822	-
Prior Year - PE 0604567N	Various	Not Specified : Not Specified	272.356	0.000		0.000		0.000		-		0.000	0.000	272.356	-
		Subtotal	311.763	3.191		5.493		0.000		-		0.000	0.000	320.447	N/A

Remarks

Change Order total is $13.069. $5.776 is prior to FY15 and is included in Prior Year PE 0604567N total of $272.356. Funding prior to FY15 for GFE, BASIC, and Other are also included in Prior Year PE 0604567N total of $272.356

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Trng Craft Studies and Analysis	Various	Various : Various	0.000	0.322	Oct 2016	0.835	Apr 2018	0.338	Oct 2018	-		0.338	0.000	1.495	-
Test & Trng Craft Integrated Logistics Support	WR	NSWC : Various	1.516	2.392	Oct 2016	0.000		0.000		-		0.000	0.000	3.908	-
T&T Post Delivery/ Outfitting	Various	SupShip Gulf Coast/ Textron : Various	0.000	0.375	Mar 2017	3.625	Apr 2018	0.000		-		0.000	0.000	4.000	-
Prior Year - PE 0604567N	Various	Not Specified : Not Specified	6.149	0.000		0.000		0.000		-		0.000	0.000	6.149	-
		Subtotal	7.665	3.089		4.460		0.338		-		0.338	0.000	15.552	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605220N / *(U)Ship to Shore Connector (SSC)*	**Project (Number/Name)** 3137 / *SSC Construction*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Trng Craft Construction Test Program	Various	Various : Various	1.578	0.000		3.154	Apr 2018	0.000		-		0.000	0.000	4.732	-
Prior Year - PE 0604567N	Various	Not Specified : Not Specified	2.268	0.000		0.000		0.000		-		0.000	0.000	2.268	-
		Subtotal	3.846	0.000		3.154		0.000		-		0.000	0.000	7.000	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Trng Craft Contractor Engineering Support	C/CPFF	CSC/Alion : Washington, DC	2.891	0.000		0.000		0.000		-		0.000	0.000	2.891	-
Travel	Various	Various : Various	0.220	0.049	Oct 2016	0.045	Apr 2018	0.000		-		0.000	0.000	0.314	-
Test & Trng Craft Government Engineering Support	WR	Various : Various	0.213	2.194	Oct 2016	0.255	Apr 2018	0.000		-		0.000	0.000	2.662	-
Prior Year - PE 0604567N	Various	Not Specified : Not Specified	22.788	0.000		0.000		0.000		-		0.000	0.000	22.788	-
		Subtotal	26.112	2.243		0.300		0.000		-		0.000	0.000	28.655	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	349.386	8.523		13.407		0.338		-		0.338	0.000	371.654	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605220N / *(U)Ship to Shore Connector (SSC)*	**Project (Number/Name)** 3137 / *SSC Construction*

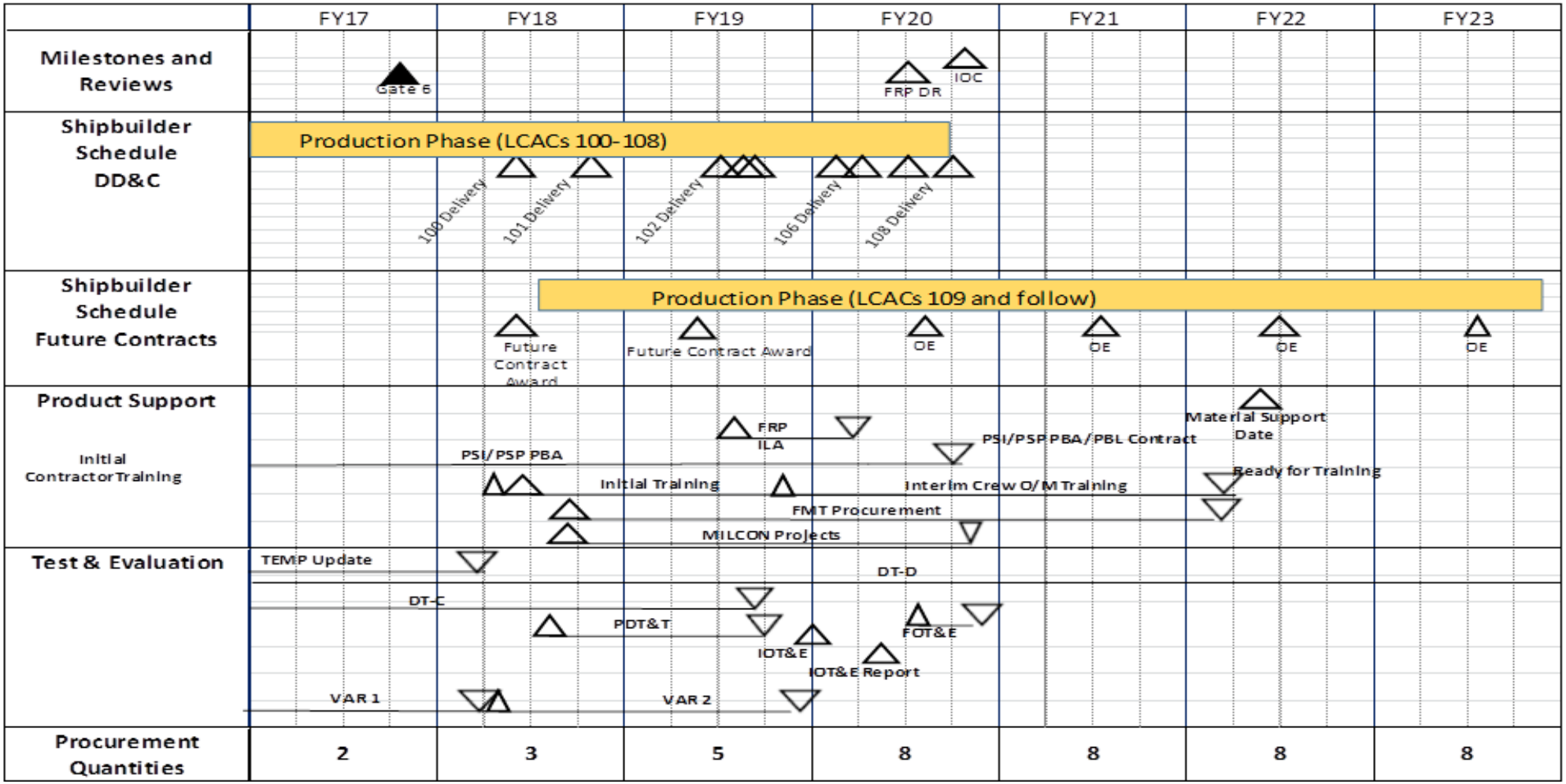


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605220N / *(U)Ship to Shore Connector (SSC)*	**Project (Number/Name)** 3137 / *SSC Construction*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3137				
LCAC 100 - Test and Training Craft Delivery	2	2018	3	2018
Post Delivery Test and Trials (PDT&T)	3	2018	4	2019

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605327N *I (U)T-AO 205 Class*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	1.062	1.961	1.298	-	1.298	2.407	5.007	1.024	0.000	0.000	12.759
3375: *T-AO 205 Class Development*	0.000	1.062	1.961	1.298	-	1.298	2.407	5.007	1.024	0.000	0.000	12.759

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): P452

A. Mission Description and Budget Item Justification

T-AO 205 John Lewis Fleet Oiler Class Test and Evaluation (T&E) in support of recapitalization of the existing T-AO 187 Fleet Oiler Class. The Navy's Combat Logistics Force (CLF) oilers supply fuel and dry cargo to Navy ships at sea. The T-AO 205 Class will operate as shuttle ships from resupply ports to customer ships. Additionally, in conjunction with a T-AKE, they will accompany and stay on-station with a Carrier Strike Group (CSG) to provide fuel as required to customer ships.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	1.095	1.961	1.312	-	1.312
Current President's Budget	1.062	1.961	1.298	-	1.298
Total Adjustments	-0.033	0.000	-0.014	-	-0.014
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.033	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.014	-	-0.014

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605327N / *(U)T-AO 205 Class*	Project (Number/Name) 3375 / *T-AO 205 Class Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3375: *T-AO 205 Class Development*	0.000	1.062	1.961	1.298	-	1.298	2.407	5.007	1.024	0.000	0.000	12.759
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P452

A. Mission Description and Budget Item Justification

T-AO 205 John Lewis Fleet Oiler Class Test and Evaluation (T&E) in support of recapitalization of the existing T-AO 187 Fleet Oiler Class. The Navy's Combat Logistics Force (CLF) oilers supply fuel and dry cargo to Navy ships at sea. The T-AO 205 Class will operate as shuttle ships from resupply ports to customer ships. Additionally, in conjunction with a T-AKE, they will accompany and stay on-station with a Carrier Strike Group (CSG) to provide fuel as required to customer ships.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: T-AO 205 Test and Evaluation	1.062	1.961	1.298	0.000	1.298
Articles:	-	-	-	-	-
FY 2018 Plans: Support the execution of Test and Evaluation DT and OT schedule per the TEMP. Continue execution of DT Phase DT-B. Develop Test Plans for OT Phase OT-C, Initial Operational Test and Evaluation (IOT&E). Conduct Detailed Design Survivability Assessment in support of shot selection for Damage Scenario Based Engineering Analysis (DSBEA) and Final Vulnerability Assessment Report (FSAR). Coordinate efforts with NAVSEA, MSC, PEO Ships, COMOPTEVFOR, JITC and OSD DOT&E.					
FY 2019 Base Plans: Support the execution of the Test and Evaluation Phases DT, OT, and LFT&E per the TEMP. Continue execution of the DT Phase DT-B. FY19 DT-B Test events include Cybersecurity DT, E3 Surveys, and Shipbuilder conducted system verification. Continue development of Test Plans for OT Phase OT-C, Initial Operational Test and Evaluation (IOT&E). Conduct Damage Scenario Based Engineering Analysis (DSBEA). Coordinate efforts with the Shipbuilder, NAVSEA, MSC, PEO Ships, COMOPTEVFOR, JITC and OSD DOT&E.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease from FY18 to FY19 planned per program testing development schedule.					
Accomplishments/Planned Programs Subtotals	1.062	1.961	1.298	0.000	1.298

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605327N / *(U)T-AO 205 Class*	**Project (Number/Name)** 3375 / *T-AO 205 Class Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• SCN/5025: *T-AO 205 Class*	73.079	541.056	1,067.599	-	1,067.599	539.358	1,035.108	523.494	1,102.793	4,534.036	10,090.713

Remarks

D. Acquisition Strategy

The first Fleet Oiler was awarded in FY16. Fleet oilers will comply with the Oil Pollution Act of 1990 (OPA-90) and International Marine Pollution Regulation (MARPOL) requirements.

E. Performance Metrics

None.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605327N / *(U)T-AO 205 Class*	Project (Number/Name) 3375 / *T-AO 205 Class Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	Various	Various : Various	0.000	0.340	Jun 2017	0.632	Jan 2018	0.494	Jan 2019	-		0.494	2.702	4.168	-
Operational Test & Evaluation	Various	Various : Various	0.000	0.477	Aug 2017	0.613	Jan 2018	0.300	Jan 2019	-		0.300	3.815	5.205	-
Live Fire Test & Evaluation	Various	Various : Various	0.000	0.245	Aug 2017	0.716	Jan 2018	0.504	Jan 2019	-		0.504	1.921	3.386	-
		Subtotal	0.000	1.062		1.961		1.298		-		1.298	8.438	12.759	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	1.062		1.961		1.298		-		1.298	8.438	12.759	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605327N / *(U)T-AO 205 Class*	**Project (Number/Name)** 3375 / *T-AO 205 Class Development*

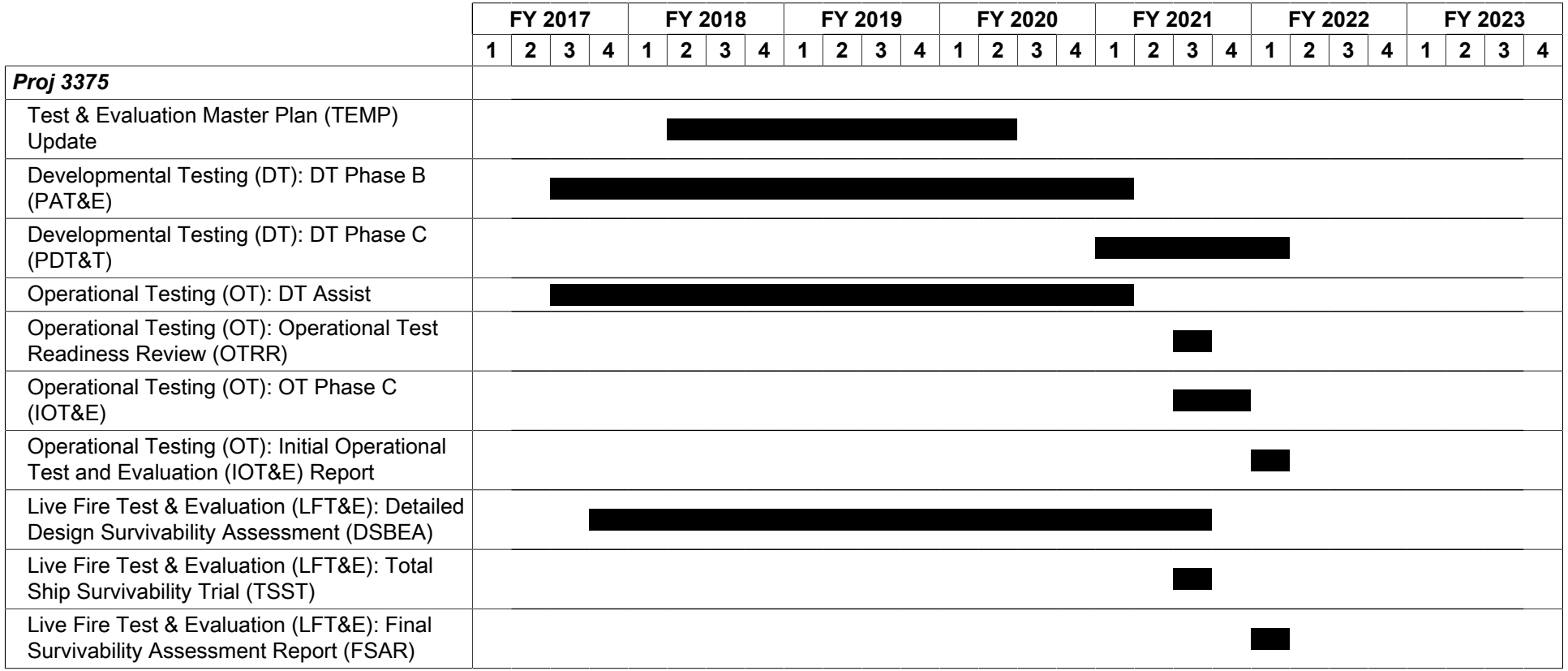


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605327N / *(U)T-AO 205 Class*	**Project (Number/Name)** 3375 / *T-AO 205 Class Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3375				
Test & Evaluation Master Plan (TEMP) Update	2	2018	2	2020
Developmental Testing (DT): DT Phase B (PAT&E)	3	2017	1	2021
Developmental Testing (DT): DT Phase C (PDT&T)	1	2021	1	2022
Operational Testing (OT): DT Assist	3	2017	1	2021
Operational Testing (OT): Operational Test Readiness Review (OTRR)	3	2021	3	2021
Operational Testing (OT): OT Phase C (IOT&E)	3	2021	4	2021
Operational Testing (OT): Initial Operational Test and Evaluation (IOT&E) Report	1	2022	1	2022
Live Fire Test & Evaluation (LFT&E): Detailed Design Survivability Assessment (DSBEA)	4	2017	3	2021
Live Fire Test & Evaluation (LFT&E): Total Ship Survivability Trial (TSST)	3	2021	3	2021
Live Fire Test & Evaluation (LFT&E): Final Survivability Assessment Report (FSAR)	1	2022	1	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605414N *I (U) Unmanned Carrier Aviation (UCA)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	75.863	222.208	718.942	-	718.942	705.972	690.368	680.097	550.469	Continuing	Continuing
3278: *MQ-25 Development*	0.000	75.863	222.208	683.915	-	683.915	679.707	688.659	678.342	550.469	Continuing	Continuing
3279: *UMCS*	0.000	0.000	0.000	35.027	-	35.027	26.265	1.709	1.755	0.000	0.000	64.756
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** P462												

Note

Elements of the MQ-25 program were previously funded under the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) System Program Element (PE) 0604404N, Project Unit (PU) 3278 and assigned to Budget Activity (BA) 05: System Development and Demonstrations (SDD). In January of 2016, PE 0605414N PU 3278 was established as the principal budget line for MQ-25. In January of 2018, PU 3279 was established for the Unmanned Carrier Aviation (UCA) Mission Control System (UMCS).

The President's Budget FY17 PE 0605414N PU 3278 submission was initially regarded as Carrier Based Aerial Refueling System (CBARS)/UCLASS Development. To better align with the mission and capability funded under PE 0605414N, it is now referred to as Unmanned Carrier Aviation (UCA)/MQ-25.

A. Mission Description and Budget Item Justification

The MQ-25 program rapidly develops an unmanned capability to embark on CVNs as part of the Carrier Air Wing (CVW) to conduct aerial refueling as a primary mission and provide Intelligence, Surveillance, Reconnaissance (ISR) capability as a secondary mission. MQ-25 extends CVW mission effectiveness range, partially mitigates the current Carrier Strike Group (CSG) organic ISR shortfall and fills the future CVW-tanker gap, mitigating Strike Fighter shortfall and preserving F/A-18E/F Fatigue Life for its primary missions. As the first carrier-based, group 5 Unmanned Aircraft System (UAS), MQ-25 will pioneer the integration of manned and unmanned operations, demonstrate mature complex sea-based Command, Control, Communications, Computers, and Intelligence (C4I) UAS technologies, and pave the way for future multifaceted multi-mission UAS to pace emerging threats.

MQ-25 requirements are aligned with the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) Initial Capabilities Document (ICD) and the Next Generation Air Dominance (NGAD) Family of Systems (FoS) ICD, which highlight the need for carrier-based refueling and persistent ISR capabilities. The Joint Requirements Oversight Council (JROC) endorsed the UCLASS ICD in April 2011 and formally approved it on 9 Jun 11 via Joint Requirements Oversight Council Memorandum (JROCM) 087-11. The NGAD FoS ICD was validated by the JROC on 18 August 2015 and formally approved by JROCM 087-15. The JROC's guidance delineated in the validated ICDs and subsequent JROCMs was to establish a requirement for a versatile platform that supports a myriad of organic Naval missions such as aerial refueling and ISR to support the CSG. The JROC validated the Capability Development Document (CDD) for MQ-25 Carrier Based Unmanned Air System (CBUAS) on 21 July 2017. MQ-25 is expected to provide an Initial Operational Capability to the fleet in 2026.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605414N *I (U) Unmanned Carrier Aviation (UCA)*

The newly established ACAT III Unmanned Carrier Aviation (UCA) Mission Control System (UMCS). UMCS is comprised of the Control System & Connectivity (CS&C) and Carrier (CVN) Segments previously captured under the MQ-25 Development PU 3278.

The Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program consists of the MQ-25 control station, designated the MD-5, and modifications to the Command, Control, Communications, Computers, and Intelligence (C4I) systems and Carrier Vessel, Nuclear (CVN) infrastructure required for MQ-25 vehicle and mission control.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes some projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	89.000	222.208	484.950	-	484.950
Current President's Budget	75.863	222.208	718.942	-	718.942
Total Adjustments	-13.137	0.000	233.992	-	233.992
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.536	0.000			
• Program Adjustments	0.000	0.000	240.294	-	240.294
• Rate/Misc Adjustments	-0.001	0.000	-6.302	-	-6.302
• Congressional General Reductions Adjustments	-0.022	-	-	-	-
• Congressional Directed Reductions Adjustments	-12.578	-	-	-	-

Change Summary Explanation

Technical: Not Applicable.

Schedule: Fixed Fleet Control Station Delivery and Hull, Mechanical, and Electrical (HME) Install 4/5 removed and will be procured out of OPN LI 4269 (UMCS-Unmanned Carrier Aviation (UCA) Mission Control System).

Engineering and Manufacturing Development (EMD) contract award delayed approximately six weeks due to a delay in the release of the final RFP.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605414N *I (U) Unmanned Carrier Aviation (UCA)*

Funding: Increase in FY2019 funding in the net amount of $233.9M provides required profile to meet Chief of Naval Operations (CNO) priority and Joint Requirements Oversight Council (JROC) validated IOC threshold date of FY2026 (contract award plus 8 years).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	Project (Number/Name) 3278 / *MQ-25 Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3278: *MQ-25 Development*	0.000	75.863	222.208	683.915	-	683.915	679.707	688.659	678.342	550.469	Continuing	Continuing
Quantity of RDT&E Articles		-	-	2	-	2	2	-	-	-		

Project MDAP/MAIS Code: P462

A. Mission Description and Budget Item Justification

The MQ-25 program rapidly develops an unmanned capability to embark on CVNs as part of the Carrier Air Wing (CVW) to conduct aerial refueling as a primary mission and provide Intelligence, Surveillance, Reconnaissance (ISR) capability as a secondary mission. MQ-25 extends CVW mission effectiveness range, partially mitigates the current Carrier Strike Group (CSG) organic ISR shortfall and fills the future CVW-tanker gap, mitigating Strike Fighter shortfall and preserving F/A-18E/F Fatigue Life for its primary missions. As the first carrier-based, group 5 Unmanned Aircraft System (UAS), MQ-25 will pioneer the integration of manned and unmanned operations, demonstrate mature complex sea-based Command, Control, Communications, Computers, and Intelligence (C4I) UAS technologies, and pave the way for future multifaceted multi-mission UAS to pace emerging threats.

MQ-25 requirements are aligned with the Unmanned Carrier Launched Airborne Surveillance and Strike (UCLASS) Initial Capabilities Document (ICD) and the Next Generation Air Dominance (NGAD) Family of Systems (FoS) ICD, which highlight the need for carrier-based refueling and persistent ISR capabilities. The Joint Requirements Oversight Council (JROC) endorsed the UCLASS ICD in April 2011 and formally approved it on 9 Jun 11 via Joint Requirements Oversight Council Memorandum (JROCM) 087-11. The NGAD FoS ICD was validated by the JROC on 18 August 2015 and formally approved by JROCM 087-15. The JROC's guidance delineated in the validated ICDs and subsequent JROCMs was to establish a requirement for a versatile platform that supports a myriad of organic Naval missions such as aerial refueling and ISR to support the CSG. The JROC validated the Capability Development Document (CDD) for MQ-25 Carrier Based Unmanned Air System (CBUAS) on 21 July 2017. MQ-25 is expected to provide an Initial Operational Capability to the fleet in 2026.

MQ-25 will be designed to conduct aerial refueling and ISR missions. MQ-25 will have the ability to refuel all carrier based fixed wing aircraft capable of aerial refueling and to pass sensor data to other aircraft, naval vessels, and ground forces. Sensor data will be transmitted at appropriate classification levels, to exploitation nodes afloat and ashore (e.g. Distributed Common Ground System - Navy). The MQ-25 system will be sustainable onboard an aircraft carrier, as well as ashore, and will be designed to minimize the logistics footprint of the current CVW.

MQ-25 will achieve these capabilities through the use of a carrier-suitable, semi-autonomous, Unmanned Air Segment; a Control System and Connectivity Segment; and a Carrier Segment. The Government will perform Lead Systems Integration (LSI), providing government-led system of systems integration for the MQ-25 Program. The LSI will coordinate across all segments and with external stakeholders to ensure program activities are synchronized. MQ-25 will interface with existing ship and land-based command and control systems, including ISR Tasking, Collection, Processing, Exploitation, and Dissemination systems.

The scope of the program includes, but is not limited to, system level requirements identification, allocation of requirements to segments and components, design, development, integration, fabrication, test, training, and support activities to provide the MQ-25 capabilities. To accomplish these capabilities MQ-25 will transition (as

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

required) technologies from other programs and adapt them into the carrier environment. MQ-25 will deliver the necessary air vehicles, command, control, connectivity, shipboard and land-based launch and recovery control systems, associated support systems, interfaces, and upgrades to other Navy systems (as required) to meet the required capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Air Segment Product Development	0.000	89.314	615.031	0.000	615.031
Articles:	-	-	-	-	-
Description: Air Segment Product Development efforts include, but are not limited to, design, development, integration, fabrication, test and training to deliver a carrier-suitable, semi-autonomous, unmanned vehicle capable of aerial refueling (give) and persistent Intelligence, Surveillance, and Reconnaissance (ISR) operations. A prime contractor (selected following a limited source competition) will deliver the Air System products. ***FY 2018 Plans:*** Complete MQ-25 source selection activities, conduct acquisition Milestone, and award Air System contract. Begin Air System contract activities. Continue Air Segment system integration and interface development activities. ***FY 2019 Base Plans:*** Continue Air System Engineering and Manufacturing Development contract activities. Continue Air Segment system integration and interface development activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Air Segment (AS) Primary Hardware and System Engineering increase from FY18 to FY19 due to a full year of execution for the FPIF Engineering & Manufacturing Development (EMD) contract and associated time critical materials for the development of the first two Air Vehicle Engineering Demonstration Models (EDMs) to meet first flight in FY2021.					
Title: Control System & Connectivity (CS&C) Segment Product Development	29.353	42.626	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: CS&C Segment Product Development is a Government-led effort which includes, but is not limited to, the hardware, software, and networks needed to establish interfaces and upgrades to existing ship and land-based command and control systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Perform Control System & Connectivity hardware/software development, integration and testing. Continue development and fabrication of Common Processing System/Common Display System-based control stations and hardware/software solutions required to enable data exchanges with shipboard and shore-based networks. Continue development and hardware hosting of open architecture mission systems software applications and integration with air vehicle command and control software. Continue integration among airborne, shipboard and terrestrial Automated Digital Network System hardware/software nodes. Continue integration and testing among control stations with shipboard and shore-based networks and data links. Conduct control station requirements verification/validation activities in Government integration lab facilities in order to meet program timelines required to support system-of-systems integration and flight test. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** MD-5 operational control stations and MQ-25 related carrier modification for hulls 4-5 removed and will be procured out of OPN LI 4269 (UMCS-Unmanned Carrier Aviation(UCA)Mission Control Station)					
Title: Carrier (CVN) Segment Product Development	17.612	31.139	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: CVN Segment Product Development is a Government-led effort which includes, but is not limited to, upgrades to existing CVN infrastructure to support accelerated delivery MQ-25 capabilities, unique modifications to the Joint Precision Approach Landing System (JPALS) and beyond the existing Program of Record (PoR), modifications to Aircraft Launch and Recovery Equipment (ALRE) to support specific MQ-25 capabilities, and integration with C4I systems. ***FY 2018 Plans:*** Begin developing software to support communication system integration with the MQ-25. Perform ship installations and upgrades to existing CVN infrastructure, especially critical CVN suitable technologies and mission essential equipment. Continue engineering efforts to develop and implement Ship Change Documents (SCDs), Ship Installation Drawings (SIDs), and Engineering Change Proposals (ECPs), and begin modifying					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
CVNs for MQ-25 hardware and software during inflexible pier-side maintenance availability periods. Continue CVN ship integration activities and development/refinement of Concepts of Employment (CONEMPs) in accordance with NAVSEA, SPAWAR, PEO (CARRIERS), CNAF, and OPNAV processes. Continue to design and develop specific modifications to existing Program of Record (PoR) shipboard systems (i.e. Landing Systems, Information Distribution Systems and Aircraft Launch and Recovery Systems) needed to support the MQ-25 capability to include required hardware and software for shipboard test and integration activities. Continue development of Navy Modernization Program (NMP) supporting shipboard Configuration Management and Logistics. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding moved to UMCS (Unmanned Carrier Aviation (UCA) Mission Control System) Project Unit 3279					
Title: Lead Systems Integration (LSI) Product Development	14.498	32.991	38.664	0.000	38.664
Articles:	-	-	-	-	-
Description: Lead Systems Integration (LSI) tasks are a Government-led effort including, but not limited to, advanced development, architecture development, interface definition, integration, system level test and evaluation, science and technology investments, roadmap refinement, and coordination of all MQ-25 capabilities across system segments and stakeholders. ***FY 2018 Plans:*** Complete MQ-25 concept refinement and Air System contract source selection activities. Continue Air Segment, Control System & Connectivity Segment, and Carrier Segment development, design, integration, interface and architecture refinement and modification activities. Continue fabrication and operation of system integration laboratories and test facilities in support of government-led development and test program activities, including implementation of open system architectures. ***FY 2019 Base Plans:*** Continue Air Segment, Control System & Connectivity Segment, and Carrier Integration Segment development, design, integration, interface, cyber security risk management framework, architecture refinement and					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
modification activities. Continue fabrication and operation of the Systems Test and Integration Lab (STIL) and test facilities in support of government-led development and test program activities, including implementation of open system architectures. Connect to air system contractor system integration laboratories and begin combined contractor and government integration activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** LSI Funding increase from FY18 to FY19 due to increased integration and test activities associated with incorporating Air Vehicle design into MQ-25 system of systems architecture. Connect to air system contractor system integration laboratories and begin combined contractor and government integration activities.					
Title: Management	6.250	6.495	6.538	0.000	6.538
Articles:	-	-	-	-	-
Description: Efforts include program, engineering, test, and logistics management. ***FY 2018 Plans:*** Perform oversight, coordination, and management of MQ-25 acquisition, system interface and integration activities. Oversee contract activities, including source selection for the Air System contract. Conduct logistics management tasks. Maintain security and program office environments. ***FY 2019 Base Plans:*** Perform oversight, coordination, and management of MQ-25 acquisition, system interface and integration activities. Oversee contract activities, including execution of the Air System Engineering, Manufacturing and Development (EMD) contract. Conduct logistics management tasks. Maintain security and program office environments. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increase from FY18 to FY19 due to increased development, integration and test activities associated with incorporating Air Vehicle design into MQ-25 system of systems architecture.					
Title: Test and Evaluation	5.606	14.092	21.563	0.000	21.563
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Continue to support development and implementation of test facilities, range, and lab test requirements. Support updates to the Test and Evaluation Master Plan (TEMP) development, support engineering events, and program management activities. Support developmental test for Control System & Connectivity and Carrier segments. Support Air Segment source selection activities. Support the accelerated stand-up of the Government Systems test & Integration Lab (STIL) in support of the FY2018 EMD contract award. ***FY 2019 Base Plans:*** Continue to support development and implementation of test facilities, range, and lab test requirements. Support updates to the Test and Evaluation Master Plan (TEMP), support engineering events, and program management activities. Support surrogate test activities for landing systems demonstrations. Support activities in Modeling and Simulation development to include validation and verification. Continue support of the Government Systems Test & Integration Lab (STIL) and continue stand up of the integrated test facilities in support of the Engineering & Manufacturing Development (EMD) contract, to include test facility installation, integration, and accreditation activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Test and Evaluation funding increase from FY18 to FY19 supports the procurement and outfitting of support equipment associated with the integrated test facilities.					
Title: Support	2.544	5.551	2.119	0.000	2.119
Articles:	-	-	-	-	-
Description: Efforts include studies, analyses, and training development support. ***FY 2018 Plans:*** Continue logistics supportability studies and analyses, modeling and simulation, and support of Manned Flight Simulation efforts. Increase development efforts of training tools for the Fleet, and development of manpower and training assessments, to support EMD contract award and timeline. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue logistics supportability studies and analyses, modeling and simulation efforts. Continue development efforts of training tools for the Fleet, and development of manpower and training assessments, to support EMD contract award and timeline. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding is higher in FY18 then FY19 for the procurement of hardware to start the development of the prototype Mission System Trainer.					
Accomplishments/Planned Programs Subtotals	75.863	222.208	683.915	0.000	683.915

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 1205/0816376N: *UCLASS T&E Facility*	40.576	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	40.576
• 4269/0204112N: *UMCS-UNMAN CARRIER AVIATION (UCA) MISSION CNTRL STN*	0.000	0.000	42.009	-	42.009	44.708	58.159	67.817	111.462	Continuing	Continuing

Remarks

D. Acquisition Strategy

Based on the Government's acquisition strategy approved in April 2017, the MQ-25 program is an evolution from the previous Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) program and is an Acquisition Category (ACAT) IC program managed by Program Executive Office, Unmanned Aviation & Strike Weapons (PEO(U&W)), PMA-268 Unmanned Carrier Aviation (UCA) Program Office. Pursuant to 10 U.S.C. 2430(d)(1), the Milestone Decision Authority (MDA) is ASN(RDA).

The MQ-25 system will enhance carrier (CVN) capability and versatility for the Joint Forces Commander through the integration of a persistent, sea-based, multi-mission aerial refueling and reconnaissance Unmanned Aircraft System (UAS) into the Carrier Air Wing (CVW). MQ-25 is comprised of three major architectural segments: an Air Segment (AS), a Control System & Connectivity (CS&C) Segment, and a CVN Segment. These segments will be managed by the PMA-268 Government Lead Systems Integrator (LSI) that provides system-of-systems integration and is also responsible for managing enterprise-level UCA architecture and associated interfaces.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

MQ-25 will use an evolutionary acquisition strategy to develop, fly, deploy, and evolve an Initial Operational Capability system for fleet integration. This MQ-25 acquisition strategy will support the development of the MQ-25 AS, supporting control and connectivity systems, and CVN modifications required for entry into Engineering & Manufacturing Development (EMD) in 2018 with an objective IOC of 2024 and a threshold IOC of 2026.

MQ-25 will pursue a fixed price incentive, firm target (FPIF) contract for the AS EMD contract.

E. Performance Metrics

Meet Navy operational requirements as defined in requirements documents.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Segment - Primary Hardware Development	C/FPIF	TBD : TBD	0.000	0.000		80.483	Aug 2018	598.780	Oct 2018	-		598.780	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		8.264	Nov 2017	15.673	Nov 2018	-		15.673	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	WR	NAWCWD : China Lake, CA	0.000	0.000		0.324	Nov 2017	0.330	Nov 2018	-		0.330	Continuing	Continuing	Continuing
Air Segment - Systems Engineering	Various	Various : Various	0.000	0.000		0.243	Mar 2018	0.248	Mar 2019	-		0.248	Continuing	Continuing	Continuing
CS&C Segment	WR	NAWCAD : Patuxent River, MD	0.000	14.605	Nov 2016	7.409	Nov 2017	0.000		-		0.000	0.000	22.014	-
CS&C Segment	Various	Various : Various	0.000	4.696	Dec 2016	2.994	Dec 2017	0.000		-		0.000	0.000	7.690	-
CS&C Segment	Various	NSMA : Arlington, VA	0.000	0.655	Dec 2016	1.347	Dec 2017	0.000		-		0.000	0.000	2.002	-
CS&C Segment	WR	SPAWAR : San Diego, CA	0.000	6.180	Dec 2016	4.969	Dec 2017	0.000		-		0.000	0.000	11.149	-
CS&C Segment (Comms, Intel, Network)	Various	Various : Various	0.000	2.459	Dec 2016	6.070	Dec 2017	0.000		-		0.000	0.000	8.529	-
CS&C Segment (CPS/ CDS)	Various	Various : Various	0.000	1.200	Nov 2016	19.837	Mar 2018	0.000		-		0.000	0.000	21.037	-
Carrier Segment (Ship Integration)	Various	Various : Various	0.000	0.319	Dec 2016	0.580	Dec 2017	0.000		-		0.000	0.000	0.899	-
Carrier Segment (Ship Integration)	WR	NAWCAD : Patuxent River, MD	0.000	14.685	Dec 2016	24.686	Dec 2017	0.000		-		0.000	0.000	39.371	-
Carrier Segment (Ship Integration)	WR	NAWCAD : Lakehurst, NJ	0.000	1.386	Dec 2016	1.178	Dec 2017	0.000		-		0.000	0.000	2.564	-
Carrier Segment	SS/FFP	Rockwell Collins : Cedar Rapids, IA	0.000	0.000		2.882	Feb 2018	0.000		-		0.000	0.000	2.882	-
Carrier Segment	WR	SPAWAR : San Diego, CA	0.000	2.144	Dec 2016	1.813	Dec 2017	0.000		-		0.000	0.000	3.957	-
LSI - Advanced Development (Primary Hardware Development)	Various	NSMA : Arlington, VA	0.000	0.151	Dec 2016	0.183	Dec 2017	0.000		-		0.000	0.000	0.334	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LSI - Advanced Development (Primary Hardware Development)	WR	NAWCAD : Patuxent River, MD	0.000	0.509	Dec 2016	0.189	Dec 2017	0.000		-		0.000	0.000	0.698	-
LSI - Advanced Development (Primary Hardware Development)	WR	NAWCWD : China Lake, CA	0.000	0.240	Nov 2016	0.000		0.000		-		0.000	0.000	0.240	-
LSI - Systems Engineering	Various	Various : Various	0.000	2.888	Dec 2016	2.046	Dec 2017	3.918	Dec 2018	-		3.918	Continuing	Continuing	Continuing
LSI - Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	9.301	Dec 2016	28.038	Dec 2017	32.106	Dec 2018	-		32.106	Continuing	Continuing	Continuing
LSI - Systems Engineering	Various	SPAWAR : San Diego, CA	0.000	1.576	Nov 2016	2.535	Nov 2017	2.640	Nov 2018	-		2.640	Continuing	Continuing	Continuing
		Subtotal	0.000	62.994		196.070		653.695		-		653.695	Continuing	Continuing	N/A

Remarks

Control System and Connectivity (CS&C)
Navy Systems Management Activity (NSMA)
Common Display System (CDS)
Common Processing System (CPS)
Lead Systems Integration (LSI)
Engineering and Manufacturing Development (EMD)

Air Segment (AS) Primary Hardware and System Engineering increase from FY18 to FY19 due to a full year of execution for the FPIF Engineering & Manufacturing Development (EMD) contract and associated time critical materials for the development of the first two Air Vehicle Engineering Demonstration Models (EDMs) to meet first flight in FY2021. FPIF "Target Value of Contract" will be updated once base contract has been awarded AUG 2018.

Carrier Segment - Funding moved to UMCS (Unmanned Carrier Aviation (UCA) Mission Control System) Project Unit 3279.

LSI Funding increase from FY18 to FY19 due to increased integration and test activities associated with incorporating Air Vehicle design into MQ-25 system of systems architecture. Connect to air system contractor system integration laboratories and begin combined contractor and government integration activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Manpower Studies & Analyses	Various	Various : Various	0.000	0.106	Jan 2017	0.113	Nov 2017	0.115	Nov 2018	-		0.115	Continuing	Continuing	Continuing
Training Development	Various	Various : Various	0.000	1.197	Dec 2016	5.438	Dec 2017	2.004	Dec 2018	-		2.004	Continuing	Continuing	Continuing
		Subtotal	0.000	1.303		5.551		2.119		-		2.119	Continuing	Continuing	N/A

Remarks

Support funding is higher in FY18 then FY19 for the procurement of hardware to start the development of the prototype Mission System Trainer.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	6.858	Dec 2016	14.079	Dec 2017	21.550	Dec 2018	-		21.550	Continuing	Continuing	Continuing
Test and Evaluation	Various	Various : Various	0.000	0.012	Jan 2017	0.013	Jan 2018	0.013	Jan 2019	-		0.013	Continuing	Continuing	Continuing
		Subtotal	0.000	6.870		14.092		21.563		-		21.563	Continuing	Continuing	N/A

Remarks

Test and Evaluation funding increase from FY18 to FY19 supports the procurement and outfitting of support equipment associated with the integrated test facilities.

Management Services ($ in Millions)

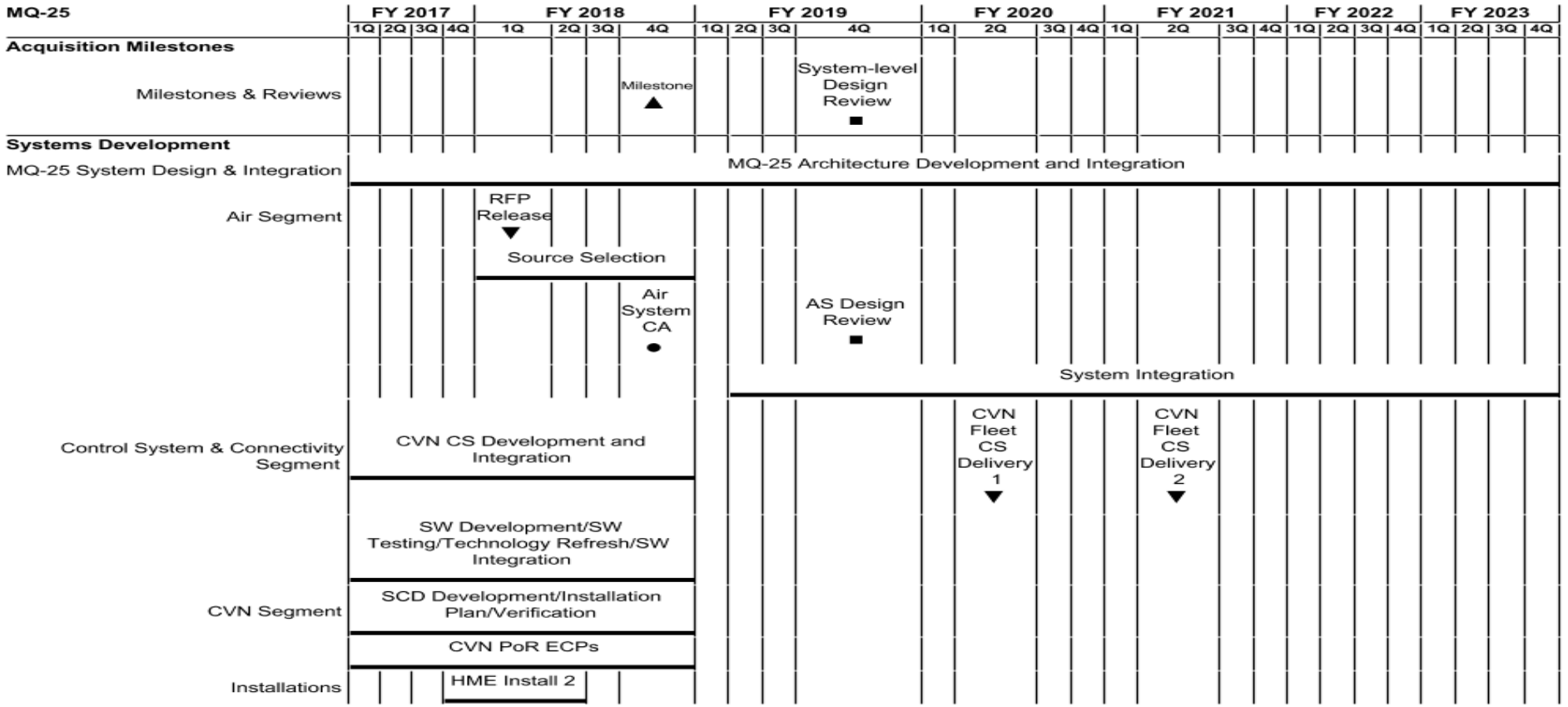
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management	Various	Various : Various	0.000	1.100	Dec 2016	1.769	Dec 2017	1.804	Dec 2018	-		1.804	Continuing	Continuing	Continuing
Management	WR	NAWCAD : Patuxent River, MD	0.000	3.542	Nov 2016	4.596	Nov 2017	4.601	Nov 2018	-		4.601	Continuing	Continuing	Continuing
Management	Various	NAVAIR : Patuxent River, MD	0.000	0.054	Oct 2016	0.130	Oct 2017	0.133	Oct 2018	-		0.133	Continuing	Continuing	Continuing
		Subtotal	0.000	4.696		6.495		6.538		-		6.538	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	Project (Number/Name) 3278 / *MQ-25 Development*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	75.863		222.208		683.915		-		683.915	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*



2019PB - 0605414N - 3278

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3278 / *MQ-25 Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MQ-25				
Acquisition Milestones: Milestones & Reviews: Milestone	4	2018	4	2018
Acquisition Milestones: Milestones & Reviews: System-level Design Review	4	2019	4	2019
Systems Development: MQ-25 System Design & Integration: MQ-25 Architecture Development and Integration	1	2017	4	2023
Systems Development: Air Segment: RFP Release for Air System Contract Award	1	2018	1	2018
Systems Development: Air Segment: Source Selection Activities	1	2018	4	2018
Systems Development: Air Segment: Air System Contract Award	4	2018	4	2018
Systems Development: Air Segment: Air System Design Review	4	2019	4	2019
Systems Development: Air Segment: System Integration	2	2019	4	2023
Systems Development: Control System & Connectivity Segment: Carrier Vessel Nuclear (CVN) Control Station (CS) Development and Integration	1	2017	4	2018
Systems Development: Control System & Connectivity Segment: CVN Fleet CS Delivery 1	2	2020	2	2020
Systems Development: Control System & Connectivity Segment: CVN Fleet CS Delivery 2	2	2021	2	2021
Systems Development: Control System & Connectivity Segment: Software (SW) Development/SW Testing/Technology Refresh/SW Integration	1	2017	4	2018
Systems Development: CVN Segment: Ship Change Document (SCD) Development/ Installation Plan/Verification	1	2017	4	2018
Systems Development: CVN Segment: CVN Program of Record (PoR) Engineering Change Proposals (ECP)	1	2017	4	2018
Systems Development: Installations: Hull, Mechanical & Electrical (HME) Install 2	4	2017	2	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	Project (Number/Name) 3279 / *UMCS*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3279: *UMCS*	0.000	0.000	0.000	35.027	-	35.027	26.265	1.709	1.755	0.000	0.000	64.756
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The President's Budget FY19 created PU 3279 to help separate the funding between the MDAP P462 (MQ-25 Development) and the newly established ACAT III Unmanned Carrier Aviation (UCA) Mission Control System (UMCS). UMCS is comprised of the Control System & Connectivity (CS&C) and Carrier Vessel, Nuclear (CVN) Segments previously captured under the MQ-25 Development PU 3278. This change provides additional clarity into the CVN installations on the MQ-25 test ships.

A. Mission Description and Budget Item Justification

The Unmanned Carrier Aviation (UCA) Mission Control System (UMCS) program consists of the MQ-25 control station, designated the MD-5, and modifications to the Command, Control, Communications, Computers, and Intelligence (C4I) systems and Carrier Vessel, Nuclear (CVN) infrastructure required for MQ-25 vehicle and mission control.

The Control Station & Connectivity (CS&C) segment is responsible for the lifecycle of the MD-5 and integration with C4I systems and infrastructure.

The CVN segment is responsible for the installation and modification to the CVN infrastructure to support MQ-25 operations. Hardware modifications include configuration of the Unmanned Aviation Warfare Center (UAWC) which houses the MD-5 components, a Video Management System (VMS) and an Unmanned Aircraft System (UAS) Mission Commander (UMC) station, and procurement and installation of an ARC-210 Radio Control System required for MQ-25 command and control (C2). Software modifications required for MQ-25 include changes to the Joint Precision Approach Landing System (JPALS) and the Aircraft Launch and Recovery Equipment (ALRE) systems.

CVN installations are regulated by NAVSEASYSCOM processes/guidelines which identify strict deadlines for documentation, drawings, and material availability due dates to support carrier modifications and due to the extent of the hardware modification, by the CVN availability schedule which identifies significant maintenance periods (revised at least twice per year) which could, in turn, drive changes to the CVN segment installation schedule.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Unmanned Carrier Aviation (UCA) Mission Control System	0.000	0.000	35.027	0.000	35.027
Articles:	-	-	-	-	-
Description: CVN Segment Product Development is a Government-led effort which includes, but is not limited to, upgrades to existing CVN infrastructure to support accelerated delivery of MQ-25 capabilities, unique					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
modifications to the Joint Precision Approach Landing System (JPALS) and the Aircraft Launch and Recovery Equipment (ALRE) to support specific MQ-25 capabilities, and integration with C4I systems. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Complete the software development modification of one (1) transmit waveform for MQ-25 line of sight (LOS) communications and enable the internet protocol (IP) port for both variants of the Generation 5 (Gen 5) ARC-210 radio. Begin development to enable the IP port on the Gen 6 ARC-210 radio. Perform system integration and laboratory testing on the ARC-210 radios. Complete the development of two engineering change proposals (ECPs) with Joint Precision Approach Landing System (JPALS). Complete hardware procurements, finish Ship Installation Drawings (SIDs), prepare and stage material, and begin the installation of four Ship Change Documents (SCDs) on one (1) CVN. Conduct environmental, shock, and vibration testing on the Video Management System and perform antenna location and frequency analysis for two (2) CVNs. Begin developing the interface requirements and associated documentation required to support the Equipment SCD and start developing the Equipment SIDs in support of a late FY20 installation. Update all SCD packages based on installation redlines, technology refresh, obsolescence, and engineering changes. Continue development efforts on Aircraft Launch and Recovery Equipment (ALRE) systems which will interface with JPALS to issue commands to the MQ-25A, and display status messages to the Landing Signal Officer (LSO) in order to recover the MQ-25A. These systems will be required for installation on the two (2) test ships in FY21 and FY22. Continue engineering efforts to develop and implement SCDs, SIDs, and ECPs. Continue CVN and Carrier Air Wing (CVW) integration activities and development/refinement of Concepts of Employment (CONEMPs) in accordance with NAVSEA, SPAWAR, PEO (CARRIERS), CNAF, and OPNAV processes. Continue development of Navy Modernization Program (NMP) supporting shipboard Configuration Management and Logistics. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Previously funded from Project 3278 - Carrier (CVN) Segment Product Development and Control System & Connectivity (CS&C) Segment Product Development.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	35.027	0.000	35.027

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The CS&C and CVN segments will be organically managed by the Government LSI and will modify existing systems via the affected system's Engineering Change Proposal and configuration management processes. These integration tasks include successful demonstration of integration with the CVN landing system, integration of control system, and integration with the Tasking, Collecting, Processing, Exploitation, Dissemination interfaces to include successful transmission of mission system data. The Government will develop and award contracts as required to support program activities, including a contract for the Air System. The Government's acquisition strategy was approved in July 2017.

E. Performance Metrics

Meet Navy operational requirements as defined in requirements documents.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	Project (Number/Name) 3279 / *UMCS*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
UMCS (Ship Integration)	Various	Various : Various	0.000	0.000		0.000		0.592	Dec 2018	-		0.592	0.580	1.172	Continuing
UMCS (Ship Integration)	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		24.282	Dec 2018	-		24.282	17.281	41.563	Continuing
UMCS (Ship Integration)	WR	NAWCAD : Lakehurst, NJ	0.000	0.000		0.000		4.162	Dec 2018	-		4.162	3.306	7.468	Continuing
UMCS	SS/FFP	Rockwell Collins : Cedar Rapids, IA	0.000	0.000		0.000		3.792	Nov 2018	-		3.792	6.557	10.349	Continuing
UMCS	C/BA	SPAWAR : San Diego, CA	0.000	0.000		0.000		2.199	Dec 2018	-		2.199	2.005	4.204	Continuing
		Subtotal	0.000	0.000		0.000		35.027		-		35.027	29.729	64.756	N/A

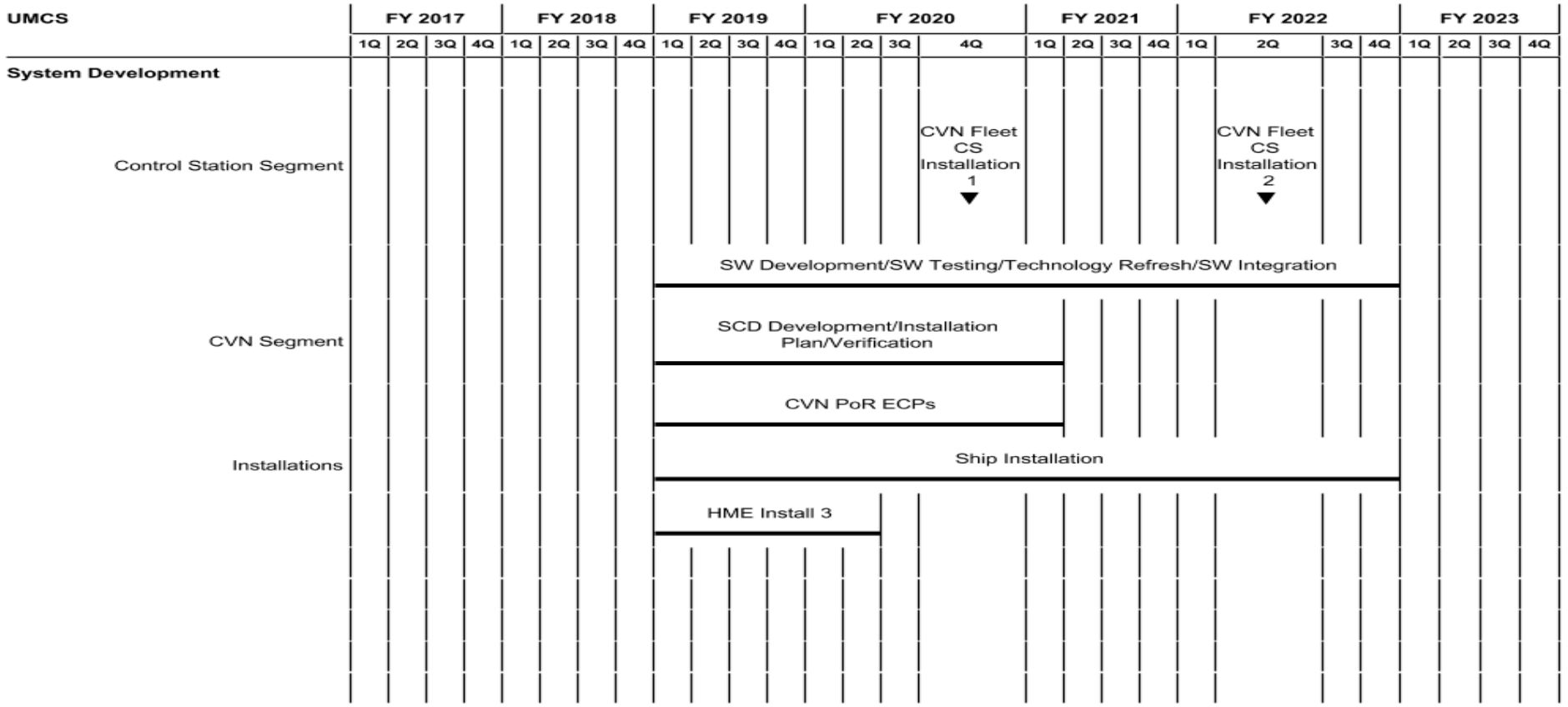
Remarks

UMCS - SS/FFP Rockwell Collins "Target Value of Contract" will be updated once base contract has been awarded in Feb 2018.

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		35.027		-		35.027	29.729	64.756	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*



2019PB - 0605414N - 3279 CS delivery and HM&E schedules are predicated on ship availability. CVN Fleet CS Deliveries and HM&E installations updated to better align with ship availability schedules.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605414N / *(U) Unmanned Carrier Aviation (UCA)*	**Project (Number/Name)** 3279 / *UMCS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
UMCS				
System Development: Control Station Segment: CVN Fleet CS Installation 1	4	2020	4	2020
System Development: Control Station Segment: CVN Fleet CS Installation 2	2	2022	2	2022
System Development: Control Station Segment: Software (SW) Development/SW Testing/Technology Refresh/SW Integration	1	2019	4	2022
System Development: CVN Segment: Ship Change Document (SCD) Development/ Installation Plan/Verification	1	2019	1	2021
System Development: CVN Segment: CVN Program of Record (PoR) Engineering Change Proposals (ECP)	1	2019	1	2021
System Development: Installations: Ship Installation	1	2019	4	2022
System Development: Installations: Hull, Mechanical & Electrical (HME) Install 3	1	2019	2	2020

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605450M *I Joint Air-to-ground Missile (JAGM)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	0.000	6.759	-	6.759	0.196	0.222	0.228	0.234	Continuing	Continuing
2211: *Joint Air-to-Ground Missile*	0.000	0.000	0.000	6.759	-	6.759	0.196	0.222	0.228	0.234	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** P355												

Note

Prior to FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was aligned to PE 0605450N. FY 2017 budget value is $17.834M; FY 2018 budget value is $15.473M.

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) is an air-launched missile system that will utilize dual-mode seeker technology providing advanced line-of-sight and beyond-line-of-sight
capabilities, including precision point and fire-and-forget seeker targeting and increased lethality against soft, hardened, moving, stationary, land, maritime threats. JAGM will
additionally provide robust capability in adverse weather, day or night and in obscured/countermeasure environments. The JAGM Increment 1 system will replace aviation-launched;
tube-launched, optically-tracked, wire-guided (TOW), and Helicopter Launched Fire-&-Forget Missile (HELLFIRE) Systems. JAGM is an Army-led joint program that addresses
rotary wing, fixed wing, and unmanned aerial vehicle requirements. The Department of Navy threshold platform is the AH-1Z. The JAGM system includes missile, trainers, containers,
support equipment and software modifications to the M-299 launcher.

The JAGM program is part of the Navy's Integrated Fire Control (IFC) approach to address advanced threat capabilities in the Anti-Access/Area-Denial (A2AD) environment. IFC
solutions enable individual system capabilities to be leveraged across an effects chain, placing the full spectrum of tactical capability in the hands of the warfighter. IFC solutions that
push engagement distances beyond the launch platform's radar horizon and allow the United States Navy to operate in, and control, contested battle space in littoral waters and A2/AD
environments are increasingly critical as more and more scenarios require compressed and coordinated fire control timelines.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under system development and demonstration because it includes those projects that have passed Milestone B
approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605450M *I Joint Air-to-ground Missile (JAGM)*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	6.759	-	6.759
Total Adjustments	0.000	0.000	6.759	-	6.759
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	6.759	-	6.759

Change Summary Explanation

The FY 2019 funding request was reduced by $0.242 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

In FY 2019 funding for Joint Air-to-Ground Missile (JAGM) was realigned from PE 0605450N.

Technical: Not applicable.
Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / *Joint Air-to-ground Missile (JAGM)*	Project (Number/Name) 2211 / *Joint Air-to-Ground Missile*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2211: *Joint Air-to-Ground Missile*	0.000	0.000	0.000	6.759	-	6.759	0.196	0.222	0.228	0.234	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P355

Note

Prior to FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was aligned to PE 0605450N.

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) is an air-launched missile system that will utilize dual-mode seeker technology providing advanced line-of-sight and beyond-line-of-sight
capabilities, including precision point and fire-and-forget seeker targeting and increased lethality against soft, hardened, moving, stationary, land, maritime threats. JAGM will
additionally provide robust capability in adverse weather, day or night and in obscured/countermeasure environments. The JAGM Increment 1 system will replace aviation-launched;
tube-launched, optically-tracked, wire-guided (TOW), and Helicopter Launched Fire-&-Forget Missile (HELLFIRE) Systems. Later increments of JAGM will be fixed wing compatible.
JAGM is an Army-led joint program that addresses rotary wing, fixed wing and unmanned aerial vehicle requirements. The Department of Navy threshold platform is the AH-1Z. The
JAGM system includes missile, trainers, containers, support equipment and software modifications to the M-299 launcher.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JAGM Engineering and Manufacturing Development (EMD) Phase	0.000	0.000	6.759	0.000	6.759
Articles:	-	-	-	-	-
FY 2018 Plans: FY 2018 plans are reflected in PE 0605450N					
FY 2019 Base Plans: FY 2019 plans include continued execution of EMD phase and AH-1Z integration activities, including continued					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605450M / *Joint Air-to-ground Missile (JAGM)*	**Project (Number/Name)** 2211 / *Joint Air-to-Ground Missile*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
airworthiness certification, software development, fixed wing studies & analysis, Developmental Testing (DT), Integration Testing (IT) and Operational Testing (OT). AH-1Z software development and test efforts will continue in support of fleet software release planned for the FY 2020 Initial Operational Capability (IOC). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 funding was realigned from PE 0605450N. FY 2018 budget value is $15.473. The program is transition from the Engineering and Manufacturing Development phase to the Production and Deployment Phase, following the Milestone C decision anticipated in May, 2018					
Accomplishments/Planned Programs Subtotals	0.000	0.000	6.759	0.000	6.759

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E ARMY, 0605450A: *JAGM*	47.446	34.626	11.900	-	11.900	3.000	2.000	0.000	0.000	Continuing	Continuing
• MPA, ARMY, C70302: *JAGM*	99.011	178.432	276.462	-	276.462	296.589	302.019	305.112	414.099	3,096.995	4,996.457
• WPN. NAVY, 2248: *JAGM*	21.922	3.789	24.109	-	24.109	24.142	49.438	50.423	76.253	1,302.797	1,552.873

Remarks

D. Acquisition Strategy

The Joint Air-to-Ground Missile (JAGM) system is an ACAT-1C Joint Army/Navy Major Defense Acquisition Program (MDAP) with the Army designated as lead service. Milestone B was achieved in July 2015 with Milestone C planned for 3QFY 2018. The Engineering, Manufacturing and Development contract was a full and open competition and was awarded July 2015. The vendor, Lockheed Martin, is responsible for the production of a technically mature and fully producible JAGM Guidance Section (GS) as well as the integration of the GS with the current HELLFIRE-R missile warhead and motor section for Increment 1 capability. The Army is responsible for the development and production of the JAGM missile and integration on the AH-64 Apache. The Navy is responsible for integration of the JAGM on the United States Marine Corps AH-1Z with an Initial Operational Capability (IOC) in FY 2020.

E. Performance Metrics

Milestone C in FY 2018; IOC in FY 2020

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / *Joint Air-to-ground Missile (JAGM)*	Project (Number/Name) 2211 / *Joint Air-to-Ground Missile*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.901	Nov 2018	-		0.901	2.704	3.605	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.459	Nov 2018	-		0.459	1.299	1.758	-
Aircraft Integration	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.372	Nov 2018	-		0.372	0.524	0.896	-
Aircraft Integration (AH-1Z)	Various	NAWCWD : China Lake, CA	0.000	0.000		0.000		1.114	Nov 2018	-		1.114	5.532	6.646	-
Contractor Aircraft	Various	Northrup Gru : Woodlawn Hills, CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Integration & Test	Various	JAMS : Huntsville, AL	0.000	0.000		0.000		0.271	Jan 2019	-		0.271	1.716	1.987	-
Contractor Integration & Test	C/FPIF	Lockheed Martin : Orlando, FL	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Studies and Analysis	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	0.200	0.200	-
Prior year cost Prod Dev no	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		3.117		-		3.117	11.975	15.092	N/A

Remarks

Funding for FY2017 and FY2018 is reflected in PE 0605450N.
Contractor Aircraft Integration (AH-1Z) - Funding in this line includes software support associated with the integration of JAGM on the AH-1Z.
Integration & Test - Funding in this line includes integration & test support, modeling & simulation and telemetry kits.
Contractor Integration & Test - Funding in this line includes hardware and support associated with the Engineering and Manufacturing Development (EMD) contract.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.163	Nov 2018	-		0.163	0.278	0.441	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450M / *Joint Air-to-ground Missile (JAGM)*	Project (Number/Name) 2211 / *Joint Air-to-Ground Missile*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.076	Nov 2018	-		0.076	0.153	0.229	-
Prior year Support cost no	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		0.239		-		0.239	0.431	0.670	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	Various	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.341	Nov 2018	-		0.341	1.958	2.299	-
Test & Evaluation	Various	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.000		-		0.000	0.127	0.127	-
Test & Evaluation	Various	USMC : MCAS Yuma, AZ	0.000	0.000		0.000		1.638	Mar 2019	-		1.638	0.375	2.013	-
Test & Evaluation	Various	Various : Various	0.000	0.000		0.000		0.132	Nov 2018	-		0.132	0.000	0.132	-
Prior year T&E cost no	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		2.111		-		2.111	2.460	4.571	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contr Eng Supt - ETS (NONFFRDC)	Various	Various : Various	0.000	0.000		0.000		0.936	Feb 2019	-		0.936	0.808	1.744	-
Management Services	Various	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.296	Nov 2018	-		0.296	0.592	0.888	-
Travel	Various	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.060	Oct 2018	-		0.060	Continuing	Continuing	Continuing
Prior year Mngt Svcs cost no	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605450M / *Joint Air-to-ground Missile (JAGM)*	**Project (Number/Name)** 2211 / *Joint Air-to-Ground Missile*

Management Services ($ in Millions)

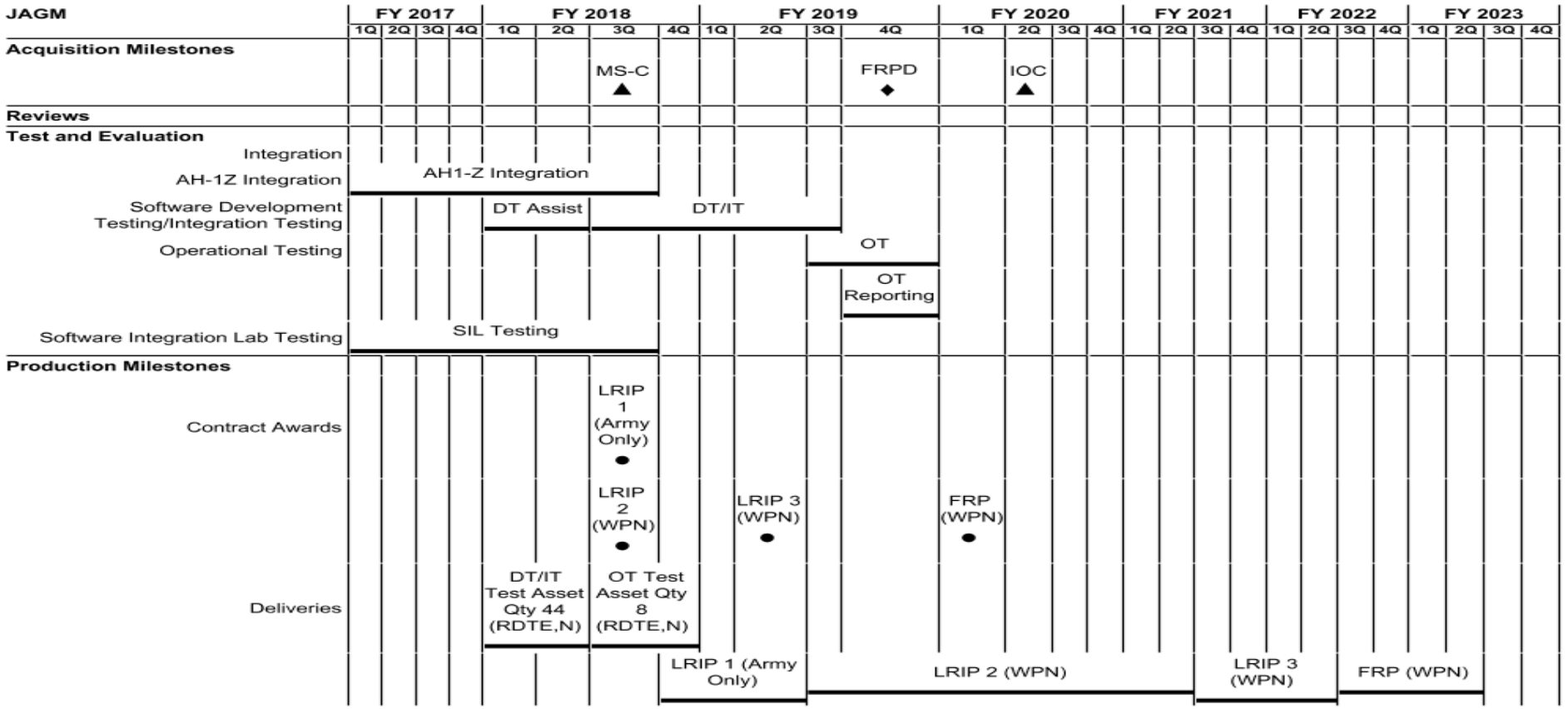
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	0.000	0.000		0.000		1.292		-		1.292	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		6.759		-		6.759	Continuing	Continuing	N/A

Remarks

1) Program acquisition milestones (minus unique Initial Operating Capability) and production milestones are joint program milestones for both Army and Navy.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605450M / *Joint Air-to-ground Missile (JAGM)*	**Project (Number/Name)** 2211 / *Joint Air-to-Ground Missile*



2019PB - 0605450M - 2211

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605450M / *Joint Air-to-ground Missile (JAGM)*	**Project (Number/Name)** 2211 / *Joint Air-to-Ground Missile*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JAGM				
Acquisition Milestones: Milestone C	3	2018	3	2018
Acquisition Milestones: IOC	2	2020	2	2020
Acquisition Milestones: FRP Decision	4	2019	4	2019
Test and Evaluation: AH-1Z Integration: AH-1Z Integration	1	2017	3	2018
Test and Evaluation: Software Development Testing/Integration Testing: DT Assist	1	2018	2	2018
Test and Evaluation: Software Development Testing/Integration Testing: DT/IT	3	2018	3	2019
Test and Evaluation: Operational Testing: OT	3	2019	4	2019
Test and Evaluation: Operational Testing: OT Reporting	4	2019	4	2019
Test and Evaluation: Software Integration Lab Testing: SIL Testing	1	2017	3	2018
Production Milestones: Contract Awards: LRIP 1 (Army Only)	3	2018	3	2018
Production Milestones: Contract Awards: LRIP 2 (WPN)	3	2018	3	2018
Production Milestones: Contract Awards: LRIP 3 (WPN)	2	2019	2	2019
Production Milestones: Contract Awards: FRP (WPN)	1	2020	1	2020
Production Milestones: Deliveries: DT/IT Test Asset	1	2018	2	2018
Production Milestones: Deliveries: OT Test Asset	3	2018	4	2018
Production Milestones: Deliveries: LRIP 1 (Army Only)	4	2018	2	2019
Production Milestones: Deliveries: LRIP 2 (WPN)	3	2019	2	2021
Production Milestones: Deliveries: LRIP 3 (WPN)	3	2021	2	2022
Production Milestones: Deliveries: FRP (WPN)	3	2022	2	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy												Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605450N *I Joint Air-to-ground Missile (JAGM)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	201.446	17.834	15.473	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.753
2211: *Joint Air-to-Ground Missile*	201.446	17.834	15.473	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.753
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** P355												

Note

Starting in FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was realigned to PE 0605450M.

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) is an air-launched missile system that will utilize dual-mode seeker technology providing advanced line-of-sight and beyond-line-of-sight capabilities, including precision point and fire-and-forget seeker targeting and increased lethality against soft, hardened, moving, stationary, land, maritime threats. JAGM will additionally provide robust capability in adverse weather, day or night and in obscured/countermeasure environments. The JAGM Increment 1 system will replace aviation-launched; tube-launched, optically-tracked, wire-guided (TOW), and Helicopter Launched Fire-&-Forget Missile (HELLFIRE) Systems. JAGM is an Army-led joint program that addresses rotary wing, fixed wing, and unmanned aerial vehicle requirements. The Department of Navy threshold platform is the AH-1Z. The JAGM system includes missile, trainers, containers, support equipment and software modifications to the M-299 launcher.

The JAGM program is part of the Navy's Integrated Fire Control (IFC) approach to address advanced threat capabilities in the Anti-Access/Area-Denial (A2AD) environment. IFC solutions enable individual system capabilities to be leveraged across an effects chain, placing the full spectrum of tactical capability in the hands of the warfighter. IFC solutions that push engagement distances beyond the launch platform's radar horizon and allow the United States Navy to operate in, and control, contested battle space in littoral waters and A2/AD environments are increasingly critical as more and more scenarios require compressed and coordinated fire control timelines.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under system development and demonstration because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605450N *I Joint Air-to-ground Missile (JAGM)*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	17.880	15.473	7.086	-	7.086
Current President's Budget	17.834	15.473	0.000	-	0.000
Total Adjustments	-0.046	0.000	-7.086	-	-7.086
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.046	0.000			
• Rate/Misc Adjustments	0.000	0.000	-7.086	-	-7.086

Change Summary Explanation

Starting in FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was realigned to PE 0605450M.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0605450N / *Joint Air-to-ground Missile (JAGM)*				Project (Number/Name) 2211 / *Joint Air-to-Ground Missile*				
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2211: *Joint Air-to-Ground Missile*	201.446	17.834	15.473	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	234.753
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P355

Note

Starting in FY 2019, funding for Joint Air-to-Ground Missile (JAGM) was realigned to PE 0605450M.

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) is an air-launched missile system that will utilize dual-mode seeker technology providing advanced line-of-sight and beyond-line-of-sight capabilities, including precision point and fire-and-forget seeker targeting and increased lethality against soft, hardened, moving, stationary, land, maritime threats. JAGM will additionally provide robust capability in adverse weather, day or night and in obscured/countermeasure environments. The JAGM Increment 1 system will replace aviation-launched; tube-launched, optically-tracked, wire-guided (TOW), and Helicopter Launched Fire-&-Forget Missile (HELLFIRE) Systems. Later increments of JAGM will be fixed wing compatible. JAGM is an Army-led joint program that addresses rotary wing, fixed wing and unmanned aerial vehicle requirements. The Department of Navy threshold platform is the AH-1Z. The JAGM system includes missile, trainers, containers, support equipment and software modifications to the M-299 launcher.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JAGM Engineering and Manufacturing Development (EMD) Phase	17.834	15.473	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: FY 2018 plans include continued execution of EMD phase and AH-1Z integration activities, including continued airworthiness certification, software development, fixed wing studies & analysis, Developmental Testing (DT), Integration Testing (IT),and a planned DT assist period to support Milestone C. AH-1Z software development and test efforts will continue in support of fleet software release planned for the FY 2020 Initial Operational Capability (IOC).					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605450N / *Joint Air-to-ground Missile (JAGM)*	**Project (Number/Name)** 2211 / *Joint Air-to-Ground Missile*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Program funding shifted to PE 0605450M, starting in FY 2019.					
Accomplishments/Planned Programs Subtotals	17.834	15.473	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E ARMY, 0605450A: *JAGM*	47.446	34.626	11.900	-	11.900	3.000	2.000	0.000	0.000	Continuing	Continuing
• MPA, ARMY, C70302: *JAGM*	99.011	178.432	276.462	-	276.462	296.589	302.019	305.112	414.099	3,096.995	4,996.457
• WPN, NAVY, 2248: *JAGM*	21.922	3.789	24.109	-	24.109	24.142	49.438	50.423	76.253	1,302.797	1,552.873

Remarks

D. Acquisition Strategy

The Joint Air-to-Ground Missile (JAGM) system is an ACAT-1C Joint Army/Navy Major Defense Acquisition Program (MDAP) with the Army designated as lead service. Milestone B was achieved in July 2015 with Milestone C planned for 3QFY 2018. The Engineering, Manufacturing and Development contract was a full and open competition and was awarded July 2015. The vendor, Lockheed Martin, is responsible for the production of a technically mature and fully producible JAGM Guidance Section (GS) as well as the integration of the GS with the current HELLFIRE-R missile warhead and motor section for Increment 1 capability. The Army is responsible for the development and production of the JAGM missile and integration on the AH-64 Apache. The Navy is responsible for integration of the JAGM on the United States Marine Corps AH-1Z with an Initial Operational Capability (IOC) in FY 2020.

E. Performance Metrics

Milestone C in FY 2018; IOC in FY 2020

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450N / *Joint Air-to-ground Missile (JAGM)*	Project (Number/Name) 2211 / *Joint Air-to-Ground Missile*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD : China Lake, CA	49.472	3.404	Nov 2016	1.014	Nov 2017	0.000		-		0.000	0.000	53.890	-
Systems Engineering	WR	NAWCAD : Patuxent River, MD	1.602	0.537	Dec 2016	0.459	Nov 2017	0.000		-		0.000	0.000	2.598	-
Aircraft Integration	WR	NAWCAD : Patuxent River, MD	9.837	0.500	Dec 2016	0.563	Nov 2017	0.000		-		0.000	0.000	10.900	-
Aircraft Integration (AH-1Z)	Various	NAWCWD : China Lake, CA	6.218	0.600	Mar 2017	2.040	Nov 2017	0.000		-		0.000	0.000	8.858	-
Contractor Aircraft Integration (AH-1Z)	Various	Northrup Grumman : Woodlawn Hills, CA	4.958	9.072	Sep 2017	3.436	Sep 2018	0.000		-		0.000	0.000	17.466	-
Integration & Test	Various	JAMS : Huntsville, AL	28.970	0.540	Mar 2017	1.576	Jan 2018	0.000		-		0.000	0.000	31.086	-
Contractor Integration & Test	C/FPIF	Lockheed Martin : Orlando, FL	12.948	0.000		0.000		0.000		-		0.000	0.000	12.948	13.448
Studies and Analysis	WR	NAWCWD : China Lake, CA	0.000	0.000		0.600	Mar 2018	0.000		-		0.000	0.000	0.600	-
Prior year cost Prod Dev no longer funded in the FYDP	Various	Various : Various	11.555	0.000		0.000		0.000		-		0.000	0.000	11.555	-
		Subtotal	125.560	14.653		9.688		0.000		-		0.000	0.000	149.901	N/A

Remarks

Contractor Aircraft Integration (AH-1Z) - Funding in this line includes software support associated with the integration of JAGM on the AH-1Z.
Integration & Test - Funding in this line includes integration & test support, modeling & simulation and telemetry kits.
Contractor Integration & Test - Funding in this line includes hardware and support associated with the Engineering and Manufacturing Development (EMD) contract.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCWD : China Lake, CA	0.248	0.883	Nov 2016	0.163	Nov 2017	0.000		-		0.000	0.000	1.294	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605450N / *Joint Air-to-ground Missile (JAGM)*	Project (Number/Name) 2211 / *Joint Air-to-Ground Missile*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	0.087	0.068	Dec 2016	0.076	Nov 2017	0.000		-		0.000	0.000	0.231	-
Prior year Support cost no longer funded in the FYDP	Various	Various : Various	12.447	0.000		0.000		0.000		-		0.000	0.000	12.447	-
		Subtotal	12.782	0.951		0.239		0.000		-		0.000	0.000	13.972	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	Various	NAWCAD : Patuxent River, MD	4.115	0.426	Mar 2017	0.451	Nov 2017	0.000		-		0.000	0.000	4.992	-
Test & Evaluation	Various	NAWCWD : China Lake, CA	0.000	0.000		2.043	Nov 2017	0.000		-		0.000	0.000	2.043	-
Test & Evaluation	Various	USMC : MCAS Yuma, AZ	0.000	0.000		1.121	Mar 2018	0.000		-		0.000	0.000	1.121	-
Test & Evaluation	Various	Various : Various	0.000	0.210	Nov 2016	0.639	Nov 2017	0.000		-		0.000	0.000	0.849	-
Prior year T&E cost no longer funded in the FYDP	Various	Various : Various	41.328	0.000		0.000		0.000		-		0.000	0.000	41.328	-
		Subtotal	45.443	0.636		4.254		0.000		-		0.000	0.000	50.333	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contr Eng Supt - ETS (NONFFRDC)	Various	Various : Various	2.853	0.633	Feb 2017	0.936	Feb 2018	0.000		-		0.000	0.000	4.422	-
Management Services	Various	NAWCAD : Patuxent River, MD	14.273	0.900	Nov 2016	0.296	Nov 2017	0.000		-		0.000	0.000	15.469	-
Travel	Various	NAWCAD : Patuxent River, MD	0.535	0.061	Oct 2016	0.060	Oct 2017	0.000		-		0.000	0.000	0.656	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605450N / *Joint Air-to-ground Missile (JAGM)*	**Project (Number/Name)** 2211 / *Joint Air-to-Ground Missile*

Management Services ($ in Millions)

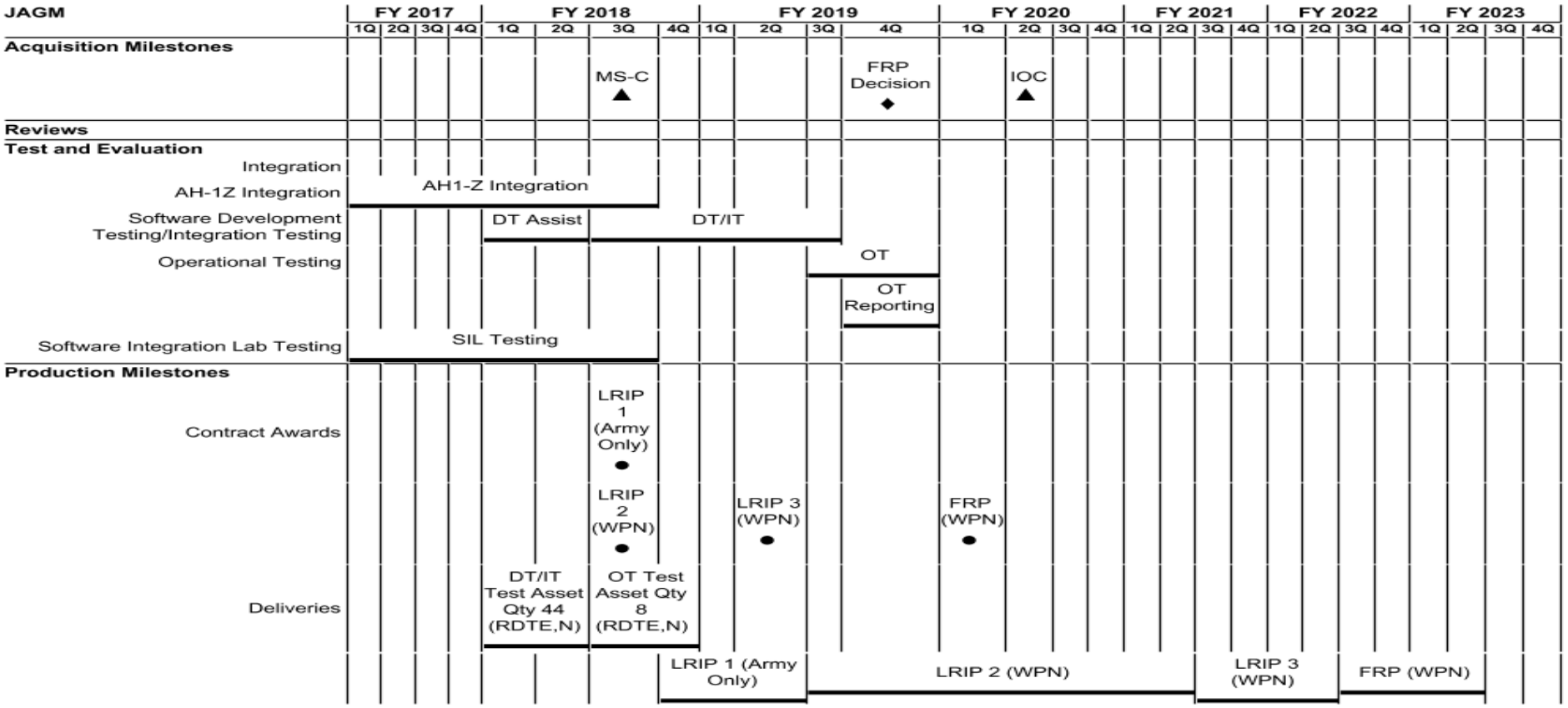
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior year Mngt Svcs cost no longer funded in the FYDP	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	17.661	1.594		1.292		0.000		-		0.000	0.000	20.547	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	201.446	17.834		15.473		0.000		-		0.000	0.000	234.753	N/A

Remarks

1) Program acquisition milestones (minus unique Initial Operating Capability) and production milestones are joint program milestones for both Army and Navy.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605450N / *Joint Air-to-ground Missile (JAGM)*	**Project (Number/Name)** 2211 / *Joint Air-to-Ground Missile*



2019PB - 0605450N - 2211

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605450N / *Joint Air-to-ground Missile (JAGM)*	**Project (Number/Name)** 2211 / *Joint Air-to-Ground Missile*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JAGM				
Acquisition Milestones: Milestone C	3	2018	3	2018
Acquisition Milestones: IOC	2	2020	2	2020
Acquisition Milestones: FRP Decision	4	2019	4	2019
Test and Evaluation: AH-1Z Integration: AH-1Z Integration	1	2017	3	2018
Test and Evaluation: Software Development Testing/Integration Testing: DT Assist	1	2018	2	2018
Test and Evaluation: Software Development Testing/Integration Testing: DT/IT	3	2018	3	2019
Test and Evaluation: Operational Testing: OT	3	2019	4	2019
Test and Evaluation: Operational Testing: OT Reporting	4	2019	4	2019
Test and Evaluation: Software Integration Lab Testing: SIL Testing	1	2017	3	2018
Production Milestones: Contract Awards: LRIP 1 (Army Only)	3	2018	3	2018
Production Milestones: Contract Awards: LRIP 2 (WPN)	3	2018	3	2018
Production Milestones: Contract Awards: LRIP 3 (WPN)	2	2019	2	2019
Production Milestones: Contract Awards: FRP (WPN)	1	2020	1	2020
Production Milestones: Deliveries: DT/IT Test Asset	1	2018	2	2018
Production Milestones: Deliveries: OT Test Asset	3	2018	4	2018
Production Milestones: Deliveries: LRIP 1 (Army Only)	4	2018	2	2019
Production Milestones: Deliveries: LRIP 2 (WPN)	3	2019	2	2021
Production Milestones: Deliveries: LRIP 3 (WPN)	3	2021	2	2022
Production Milestones: Deliveries: FRP (WPN)	3	2022	2	2023

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605500N *I Multi-mssn Maritime Aircraft (MMA) (P-8A)*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	7,941.253	61.959	11.795	37.296	-	37.296	10.184	10.381	10.575	10.767	Continuing	Continuing
2696: *Multi-Mission Maritime Aircraft*	7,860.321	50.291	8.995	7.466	-	7.466	0.001	0.000	0.000	0.000	0.000	7,927.074
3368: *P-8 Improvements*	1.491	1.996	2.800	29.830	-	29.830	10.183	10.381	10.575	10.767	Continuing	Continuing
9999: *Congressional Adds*	79.441	9.672	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	89.113
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 334												

A. Mission Description and Budget Item Justification

The P-8A Multi-mission Maritime Aircraft will replace the aging P-3 aircraft. The P-8A program was initiated in response to the Joint Requirements Oversight Council (JROC) validated Mission Needs Statement, "Broad Area Maritime and Littoral Armed Intelligence, Surveillance and Reconnaissance" and the requirements for the program are defined in the P-8A Capability Production Document #791-88-09, validated and approved on 22 June 2009. A successful Critical Design Review was completed in June 2007. In August 2007 the Design Readiness Review was conducted and resulted in approval to obligate funding for the fabrication of the Stage II flight test aircraft. The first flight of P-8A occurred on 25 Apr 2009. Milestone (MS) C was successfully completed on 11 August 2010. The program completed Initial Operational Test and Evaluation (IOT&E) in March 2013 and achieved Initial Operational Capability (IOC) in November 2013. The Acquisition Decision Memorandum approved entry into Full Rate Production on January 3, 2014.

The primary objectives of Systems Development and Demonstration (SDD) are to perform the system detailed design, develop and produce Systems Integration Labs, develop and build ground and flight test articles, and conduct ground and flight tests to successfully achieve program milestones. Ground testing includes the conduct of static testing, fatigue testing and Live Fire Test and Evaluation. Six flight test aircraft have been built during SDD (PU 2696). These test aircraft are grouped into two stages based on which phase of the test program the aircraft will support. SDD Stage I flight test aircraft (FY06/Qty-3) support Integrated Test and Evaluation (IT&E). SDD Stage II flight test aircraft (FY09/Qty-3) supported the completion of IT&E and Initial Operational Test and Evaluation (IOT&E) after being updated to the production configuration. The SDD contract includes the development and initial building of training devices to support IOT&E. The scope of SDD includes activities necessary to facilitate an efficient transition of the fleet to achieve the P-8A Initial Operational Capability (IOC) of SDD (PU 2696) in CY13. The scope of SDD also includes the engineering and verification of corrected deficiencies identified in testing and Fleet operational use. P-8A entered Production and Deployment phase in the 4th quarter of FY10 and entered Full Rate Production in 2nd quarter of FY14.

P-8A program is based on an evolutionary acquisition strategy consisting of sequential incremental enhancements to system capabilities that will retain cost-wise effectiveness for winning major combat operations. In order to pace the threat, Spiral One (Increment 2), the Next Phase of Capabilities, will incorporate the following capabilities into the P-8A: Multi-Static Active Coherent (MAC), Automatic Identification System, Rapid Capabilities Insertion (RCI), updates to the Tactical Operations Center (TOC), as well as additional Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASuW) and Intelligence Surveillance and Reconnaissance capabilities as Engineering Change Proposals (ECPs). The scope of this effort includes the integration, design, ground testing (lab & aircraft) and flight test of the capability

enhancements to the P-8A and associated Tactical Operations Center ground support facilities and initial trainers. Integration and test of these capabilities as well as integration of Advanced Airborne Sensor (AAS) capability will be accomplished incrementally, based on the scope of the integration effort. This includes support of Special Mission Configuration Test Program (SMCTP).

The P-8A Multi-mission Maritime Aircraft (MMA) program also includes a sequence of RCI's and rapid development efforts to respond to evolving threats which will retain cost-wise effectiveness for winning major combat operations. In order to pace the threat, these efforts will incorporate incremental software and hardware improvements to existing sensors, communications systems, mission systems, weapons capabilities and Tactical Operations Center (TOC) to build on the P-8A capability baseline. These capabilities, and other emergent capability requirements, will be prioritized through the Navy Integration and Interoperability (I&I)-aligned Capability Prioritization Process (CPP) and P-8A Tier 3 Capability Roadmap. The CPP process will be supported by detailed analysis and the maturation of developing technologies.

Budget Activity 5.
JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	59.126	11.795	19.687	-	19.687
Current President's Budget	61.959	11.795	37.296	-	37.296
Total Adjustments	2.833	0.000	17.609	-	17.609
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.155	0.000			
• Program Adjustments	0.000	0.000	17.993	-	17.993
• Rate/Misc Adjustments	0.000	0.000	-0.384	-	-0.384
• Congressional General Reductions Adjustments	-0.012	-	-	-	-
• Congressional Directed Reductions Adjustments	-5.000	-	-	-	-
• Congressional Add Adjustments	10.000	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605500N *I Multi-mssn Maritime Aircraft (MMA) (P-8A)*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Small Business Technology Insertion*	9.672	0.000
Congressional Add Subtotals for Project: 9999	9.672	0.000
Congressional Add Totals for all Projects	9.672	0.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	Project (Number/Name) 2696 / *Multi-Mission Maritime Aircraft*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2696: *Multi-Mission Maritime Aircraft*	7,860.321	50.291	8.995	7.466	-	7.466	0.001	0.000	0.000	0.000	0.000	7,927.074
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 334

A. Mission Description and Budget Item Justification

The P-8A Multi-mission Maritime Aircraft (MMA) will replace the aging P-3 aircraft. The P-8A program was initiated in response to the Joint Requirements Oversight Council (JROC) validated Mission Needs Statement (MNS), "Broad Area Maritime and Littoral Armed Intelligence, Surveillance and Reconnaissance" and the requirements for the program are defined in the P-8A Capability Production Document (CPD) #791-88-09, validated and approved on 22 June 2009. A successful Critical Design Review was completed in June 2007. In August 2007 the Design Readiness Review was conducted and resulted in approval to obligate funding for the fabrication of the Stage II flight test aircraft. The first flight of P-8A occurred on 25 Apr 2009. Milestone (MS) C was successfully completed on 11 August 2010. The program completed Initial Operational Test and Evaluation (IOT&E) in March 2013 and achieved Initial Operational Capability (IOC) in November 2013. The Acquisition Decision Memorandum approved entry into Full Rate Production on January 3, 2014.

The primary objectives of Systems Development and Demonstration (SDD) are to perform the system detailed design, develop and produce Systems Integration Labs, develop and build ground and flight test articles, and conduct ground and flight tests to successfully achieve program milestones. Ground testing includes the conduct of static testing, fatigue testing and Live Fire Test and Evaluation. Six flight test aircraft have been built during SDD. These test aircraft are grouped into two stages based on which phase of the test program the aircraft will support. SDD Stage I flight test aircraft (FY06/Qty-3) support Integrated Test and Evaluation (IT&E). SDD Stage II flight test aircraft (FY09/Qty-3) supported the completion of IT&E and Initial Operational Test and Evaluation (IOT&E) after being updated to the production configuration. The SDD contract includes the development and initial building of training devices to support IOT&E. The scope of SDD includes activities necessary to facilitate an efficient transition of the fleet to achieve the P-8A Initial Operational Capability (IOC) of SDD (PU 2696) in CY13. The scope of SDD also includes the engineering and verification of corrected deficiencies identified in testing and Fleet operational use and the baseline air to air refueling. P-8A entered Production and Deployment phase in the 4th quarter of FY10 and entered Full Rate Production in 2nd quarter of FY14.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Continue System Development & Demonstration	47.273	8.410	7.096	0.000	7.096
Articles:	-	-	-	-	-
FY 2018 Plans: SDD phase. Scope of effort includes: support and update to ground and flight test articles (Stage I and II), continuation of Third Lifetime Full-Scale Fatigue Test analysis and completion of H-Stab static testing analysis.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 2696 / *Multi-Mission Maritime Aircraft*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
SDD phase. Scope of effort includes: support and update to ground and flight test articles (Stage I and II), and completion of Third Lifetime Full-Scale Fatigue Test analysis. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease is due to execution and Congressional adjustments.					
Title: Continue Engineering and Technical Development and Test for Sys Dev & Demonstration contracts	3.018	0.585	0.370	0.000	0.370
Articles:	-	-	-	-	-
FY 2018 Plans: Continue analysis of contracted deliverables; direct technical and logistic support of system development test aircraft; conduct fatigue analysis and delivery of reports; evaluate contract cost, schedule, and performance; test preparations, provide necessary government furnished equipment and test articles, risk assessment/mitigation; program control; and performance status. Conduct and support IT&E and FOT&E/VCD. ***FY 2019 Base Plans:*** Continue analysis of contracted deliverables; direct technical and logistic support of system development test aircraft; conduct fatigue analysis and delivery of reports; evaluate contract cost, schedule, and performance; test preparations, provide necessary government furnished equipment and test articles, risk assessment/mitigation; program control; and performance status. Conduct and support FOT&E/VCD. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease is due to execution and Congressional adjustments.					
Accomplishments/Planned Programs Subtotals	50.291	8.995	7.466	0.000	7.466

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN1/0193: *P-8A MMA*	1,820.238	1,245.251	1,803.753	-	1,803.753	1,695.995	95.624	0.000	0.000	0.000	22,094.164
• APN6/0605: *P-8A Initial Spares*	47.795	33.063	37.899	-	37.899	0.000	0.000	0.000	0.000	0.000	553.433

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 2696 / *Multi-Mission Maritime Aircraft*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The MMA Milestone 0 was approved 22 March 2000 and the resulting Acquisition Decision Memorandum directed P-8A to begin the Concept Exploration phase consisting of an Analysis of Alternatives and industry concept studies. These activities began 3Q/01 and were funded under Program Element 0702207N Project Unit W2737. Approval to enter Component Advance Development (CAD) was attained from the Overarching Integrated Product Team on 18 Jan 2002 and the Milestone Decision Authority Under Secretary of Defense for Acquisition, Technology, & Logistics approved the program Acquisition Strategy on 8 Feb 2002. The CAD was a competitive award to multiple contractors to define alternative MMA concept system architectures and evaluate associated risks and proposed mitigations. Selection of MMA concept and approval to enter SDD phase occurred at MS B decision review on 28 May 2004. The contract was awarded to Boeing on 14 June 2004. The SDD phase is being used to design, develop and test the P-8A system. The P-8A program was initiated in response to the Joint Requirements Oversight Council validated Mission Needs Statement, "Broad Area Maritime and Littoral Armed Intelligence, Surveillance and Reconnaissance" and the requirements for the program are defined in the Capability Production Document. MS C was successfully completed on 11 August 2010 approving entry into the Production and Deployment Phase. P-8A Initial Operational Capability achieved in November 2013. Entry into Full Rate Production was approved on 3 January 2014.

E. Performance Metrics

Completed first period of Follow-On Test & Evaluation (FOT&E) and Verification of Corrected Deficiencies (VCD) in 2nd quarter 2014. Completed second and third FOT&E and VCD Feb 2015 and Dec 2015. Completed Air to Air Refueling (AAR) ground and developmental flight testing, H-Stab fatigue and residual strength testing, and Second Lifetime Full- Scale Fatigue Test cycling in FY16. H-Stab static and AAR operational test will be completed in FY17. Completion of FY18 & FY19 FOT&E and VCD. Completion of Fatigue Testing analysis.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	Project (Number/Name) 2696 / *Multi-Mission Maritime Aircraft*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Dev - Boeing	C/CPAF	Boeing : Seattle, WA	6,951.548	45.254	Oct 2016	7.751	Dec 2017	6.946	Dec 2018	-		6.946	0.000	7,011.499	7,011.499
Sys Eng (gov)	WR	NAWC AD : Pax River, MD	82.276	2.019	Nov 2016	0.659	Nov 2017	0.150	Nov 2018	-		0.150	0.000	85.104	-
Prior year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	319.530	0.000		0.000		0.000		-		0.000	0.000	319.530	-
		Subtotal	7,353.354	47.273		8.410		7.096		-		7.096	0.000	7,416.133	N/A

Remarks

The FY2019 funding request was reduced by $0.003 million to account for the availability of prior year execution balances.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Int. Log Gov	WR	NAWC AD : Pax River, MD	43.918	0.035	Nov 2016	0.000		0.000		-		0.000	0.000	43.953	-
Tech Dev Gov	WR	NAWC AD : Pax River, MD	77.091	0.162	Nov 2016	0.162	Nov 2017	0.160	Nov 2018	-		0.160	0.000	77.575	-
Prior year Support cost no longer funded in the FYDP	Various	Various : Various	31.369	0.000		0.000		0.000		-		0.000	0.000	31.369	-
		Subtotal	152.378	0.197		0.162		0.160		-		0.160	0.000	152.897	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev T&E - Gov	WR	NAWC AD : Pax River, MD	99.394	1.195	Nov 2016	0.000		0.000		-		0.000	0.000	100.589	-
GFE & GFI	WR	NAWC AD : Pax River, MD	89.544	0.463	Nov 2016	0.000		0.000		-		0.000	0.000	90.007	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	Project (Number/Name) 2696 / *Multi-Mission Maritime Aircraft*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Oper Test & Eval	WR	NAWC AD : Pax River, MD	6.642	0.147	Nov 2016	0.000		0.000		-		0.000	0.000	6.789	-
Prior year T&E cost no longer funded in the FYDP	Various	Various : Various	39.471	0.000		0.000		0.000		-		0.000	0.000	39.471	-
		Subtotal	235.051	1.805		0.000		0.000		-		0.000	0.000	236.856	N/A

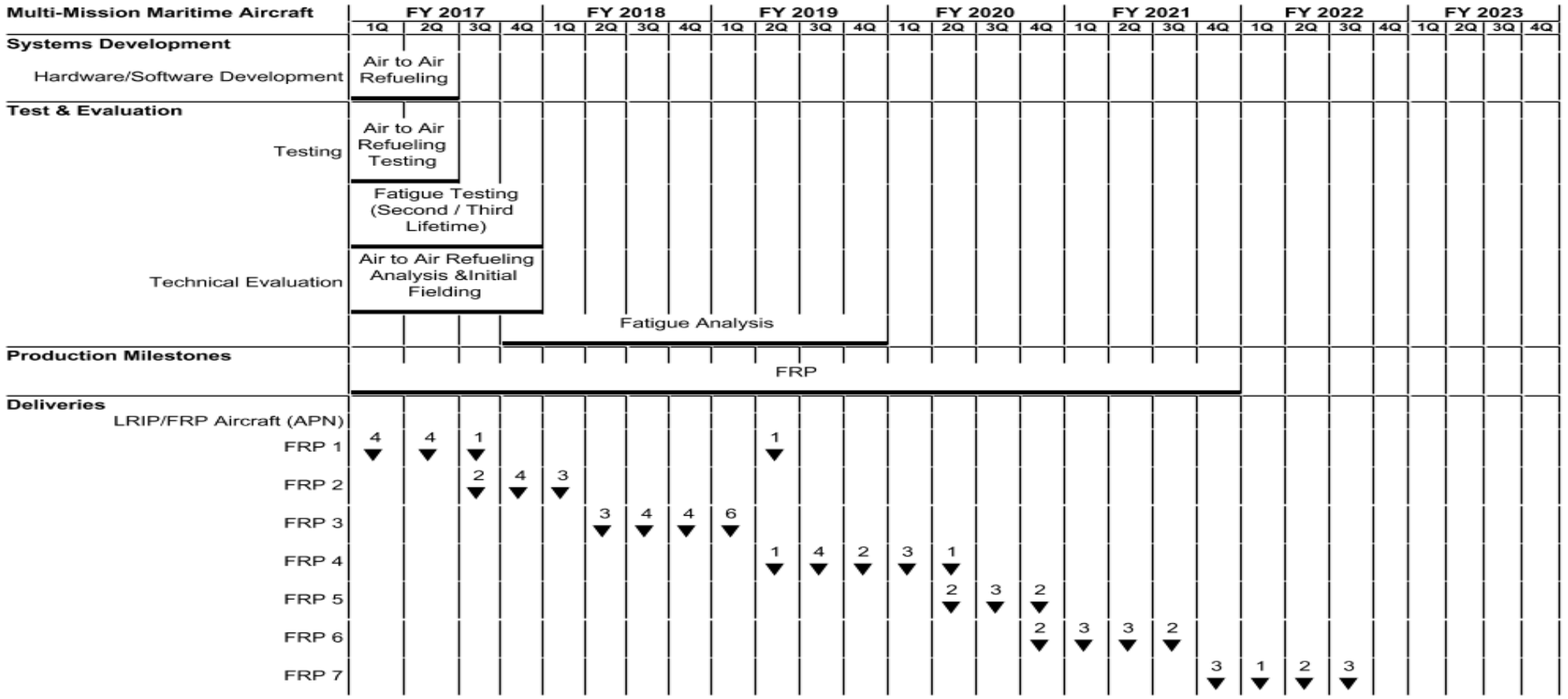
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mgmt Suppt Serv (NON-FFRDC)	C/CPFF	RBC INC : Alexandria, VA	31.919	0.381	Nov 2016	0.000		0.000		-		0.000	0.000	32.300	32.300
Eng Tech Serv (NON-FFRDC)	C/CPFF	ASEC : Lexington Park MD	11.453	0.125	Nov 2016	0.000		0.000		-		0.000	0.000	11.578	11.578
Program Mgmt Support	WR	NAWC AD : Pax River, MD	51.654	0.360	Nov 2016	0.360	Nov 2017	0.160	Nov 2018	-		0.160	0.000	52.534	-
Travel	Allot	NAWC AD : Pax River, MD	4.154	0.150	Nov 2016	0.063	Nov 2017	0.050	Oct 2018	-		0.050	0.000	4.417	-
Prior year Mgmt cost no longer funded in the FYDP	Various	Various : Various	20.358	0.000		0.000		0.000		-		0.000	0.000	20.358	-
		Subtotal	119.538	1.016		0.423		0.210		-		0.210	0.000	121.187	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7,860.321	50.291		8.995		7.466		-		7.466	0.000	7,927.073	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 2696 / *Multi-Mission Maritime Aircraft*



2019PB - 0605500N - 2696

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 2696 / *Multi-Mission Maritime Aircraft*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Multi-Mission Maritime Aircraft				
Systems Development: Hardware/Software Development: Air to Air Refueling	1	2017	2	2017
Test & Evaluation: Testing: Air to Air Refueling Testing	1	2017	2	2017
Test & Evaluation: Testing: Fatigue Testing (Second / Third Lifetime)	1	2017	4	2017
Test & Evaluation: Technical Evaluation: Air to Air Refueling Analysis & Initial Fielding	1	2017	4	2017
Test & Evaluation: Technical Evaluation: Fatigue Analysis	4	2017	4	2019
Production Milestones: Full Rate Production (FRP)	1	2017	4	2021
Deliveries: FRP 1: FRP Aircraft (APN) Q1 2017	1	2017	1	2017
Deliveries: FRP 1: FRP Aircraft (APN) Q2 2017	2	2017	2	2017
Deliveries: FRP 1: FRP Aircraft (APN) Q3 2017	3	2017	3	2017
Deliveries: FRP 1: FRP Aircraft (APN) Q2 2019	2	2019	2	2019
Deliveries: FRP 2: FRP Aircraft (APN) Q3 2017	3	2017	3	2017
Deliveries: FRP 2: FRP Aircraft (APN) Q4 2017	4	2017	4	2017
Deliveries: FRP 2: FRP Aircraft (APN) Q1 2018	1	2018	1	2018
Deliveries: FRP 3: FRP Aircraft (APN) Q2 2018	2	2018	2	2018
Deliveries: FRP 3: FRP Aircraft (APN) Q3 2018	3	2018	3	2018
Deliveries: FRP 3: FRP Aircraft (APN) Q4 2018	4	2018	4	2018
Deliveries: FRP 3: FRP Aircraft (APN) Q1 2019	1	2019	1	2019
Deliveries: FRP 4: FRP Aircraft (APN) Q2 2019	2	2019	2	2019
Deliveries: FRP 4: FRP Aircraft (APN) Q3 2019	3	2019	3	2019
Deliveries: FRP 4: FRP Aircraft (APN) Q4 2019	4	2019	4	2019
Deliveries: FRP 4: FRP Aircraft (APN) Q1 2020	1	2020	1	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 2696 / *Multi-Mission Maritime Aircraft*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: FRP 4: FRP Aircraft (APN) Q2 2020	2	2020	2	2020
Deliveries: FRP 5: FRP Aircraft (APN) Q2 2020	2	2020	2	2020
Deliveries: FRP 5: FRP Aircraft (APN) Q3 2020	3	2020	3	2020
Deliveries: FRP 5: FRP Aircraft (APN) Q4 2020	4	2020	4	2020
Deliveries: FRP 6: FRP Aircraft (APN) Q4 2020	4	2020	4	2020
Deliveries: FRP 6: FRP Aircraft (APN) Q1 2021	1	2021	1	2021
Deliveries: FRP 6: FRP Aircraft (APN) Q2 2021	2	2021	2	2021
Deliveries: FRP 6: FRP Aircraft (APN) Q3 2021	3	2021	3	2021
Deliveries: FRP 7: FRP Aircraft (APN) Q4 2021	4	2021	4	2021
Deliveries: FRP 7: FRP Aircraft (APN) Q1 2022	1	2022	1	2022
Deliveries: FRP 7: FRP Aircraft (APN) Q2 2022	2	2022	2	2022
Deliveries: FRP 7: FRP Aircraft (APN) Q3 2022	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	Project (Number/Name) 3368 / *P-8 Improvements*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3368: *P-8 Improvements*	1.491	1.996	2.800	29.830	-	29.830	10.183	10.381	10.575	10.767	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The P-8A Multi-mission Maritime Aircraft (MMA) program also includes a sequence of Rapid Capability Insertions (RCI) and rapid development efforts to respond to evolving threats which will retain cost-wise effectiveness for winning major combat operations. In order to pace the threat, these efforts will incorporate incremental software and hardware improvements to existing sensors, communications systems, mission systems, weapons capabilities and Tactical Operations Center (TOC)/ TACMobile to build on the P-8A capability baseline. These capabilities, and other emergent capability requirements, will be prioritized either through the Navy Integration and Interoperability (I&I)-aligned Capability Prioritization Process (CPP), P-8A Tier 3 Capability Roadmap and/or through an Urgent Operational Need. The CPP process will be supported by detailed analysis and the maturation of developing technologies.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Perform technology demonstrations and analyses of proposed new capabilities	0.984	2.172	29.026	0.000	29.026
Articles:	-	-	-	-	-
FY 2018 Plans: Develop Rapid Capability Insertions to incrementally incorporate software and hardware improvements to build on the existing P-8A Capability Baseline					
FY 2019 Base Plans: Develop Rapid Capability Insertions to incrementally incorporate software and hardware improvements to build on the existing P-8A Capability Baseline. Begin full scale development and integration of Airborne Weapons Simulator (AWS) capability and RCI-4 to include MAC/Non-Acoustic enhancements and Theatre ASW interoperability improvements.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY2019 increase of $26.854M funds the Airborne Weapons Simulator(AWS). AWS enables increased crew weapons proficiency thus decreasing future weapons training costs.					
Title: Conduct technical, cost, risk and logistics analysis of proposed technologies	1.012	0.628	0.804	0.000	0.804
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 3368 / *P-8 Improvements*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: Conduct technical, cost, risk and logistics analysis of proposed technologies. Evaluate system requirements through cost/performance trade-off analysis. Provide technical and management support for the development of acquisition documentation. Provide engineering and management of technical development effort. Increase in government led prototyping. ***FY 2019 Base Plans:*** Conduct technical, cost, risk and logistics analysis of proposed technologies. Evaluate system requirements through cost/performance trade-off analysis. Provide technical and management support for the development of acquisition documentation. Provide engineering and management of technical development effort. Increase in government led prototyping. Begin full scale development and integration of Airborne Weapons Simulation (AWS) capability and RCI-4 to include MAC/Non-Acoustic enhancements and Theatre ASW interoperability improvements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2019 increase is due planned government led development and prototyping efforts supporting the Airborne Weapons Simulator (AWS).					
Accomplishments/Planned Programs Subtotals	1.996	2.800	29.830	0.000	29.830

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The P-8A Multi-mission Maritime Aircraft (MMA) program also includes a sequence of Rapid Capability Insertions (RCI) and rapid development efforts to respond to evolving threats which will retain cost-wise effectiveness for winning major combat operations beyond 2020. In order to pace the threat, these efforts will incorporate incremental software and hardware improvements to existing sensors, communications systems, mission systems, weapons capabilities and Tactical Operations Center (TOC) to build on the P-8A capability baseline. These capabilities, and other emergent capability requirements, will be prioritized through the Navy Integration and Interoperability (I&I)-aligned Capability Prioritization Process (CPP), P-8A Tier 3 Capability Roadmap and/or through an Urgent Operational Need. The CPP process will be supported by detailed analysis and the maturation of developing technologies.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 3368 / *P-8 Improvements*

E. Performance Metrics

Complete ABA prototyping on capabilities beyond Increment 3 (PE 0605504N).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 3368 / *P-8 Improvements*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Dev - P-8 Improvements	Various	Various : Various	0.000	0.474	Nov 2016	0.182	Nov 2017	0.244	Nov 2018	-		0.244	1.027	1.927	-
Primary HW/SW Dev - RCI Theatre ASW/Prototyping	C/CPFF	CTI : California, MD	0.264	0.314	Feb 2017	1.300	Feb 2018	2.716	Feb 2019	-		2.716	11.459	16.053	16.053
Primary HW Dev - RCI/ Airborne Weapons Simulator	C/CPFF	Boeing : Seattle, WA	0.000	0.000		0.000		23.100	Jun 2019	-		23.100	11.583	34.683	34.683
Primary SW Dev - RCI	TBD	TBD : TBD	0.000	0.000		0.000		0.653	Jun 2019	-		0.653	2.325	2.978	-
Sys Eng - Gov	WR	NAWCAD : Pax River, MD	0.210	0.196	Nov 2016	0.690	Nov 2017	2.313	Nov 2018	-		2.313	Continuing	Continuing	Continuing
		Subtotal	0.474	0.984		2.172		29.026		-		29.026	Continuing	Continuing	N/A

Remarks

The FY2019 funding request was reduced by $0.004 million to account for the availability of prior year execution balances.

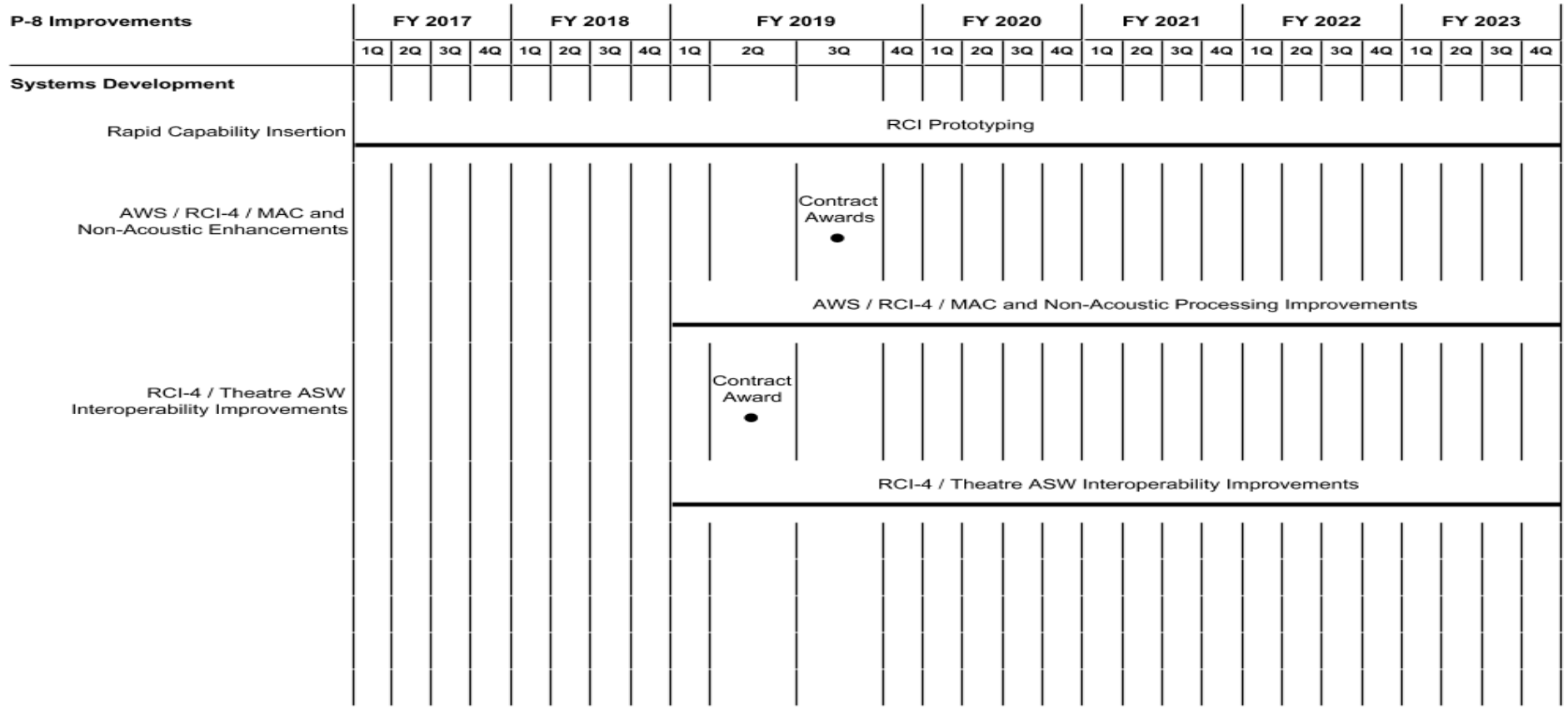
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Eng Tech Serv (NON-FFRDC)	C/CPFF	Sabre, Inc : Warrington, PA	0.297	0.189	Nov 2016	0.284	Nov 2017	0.320	Nov 2018	-		0.320	1.281	2.371	2.371
Mgmt Support Serv	C/CPFF	RBC : Alexandria, VA	0.000	0.451	Nov 2016	0.118	Nov 2017	0.153	Nov 2018	-		0.153	0.712	1.434	1.434
Program Mgmt Support	WR	NAWCAD : Pax River, MD	0.720	0.372	Nov 2016	0.226	Nov 2017	0.331	Nov 2018	-		0.331	Continuing	Continuing	Continuing
		Subtotal	1.017	1.012		0.628		0.804		-		0.804	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.491	1.996		2.800		29.830		-		29.830	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 3368 / *P-8 Improvements*



2019OSD - 0605500N - 3368

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 3368 / *P-8 Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
P-8 Improvements				
Systems Development: Rapid Capability Insertion: RCI Prototyping	1	2017	4	2023
Systems Development: AWS / RCI-4 / MAC and Non-Acoustic Enhancements: Contract Awards	3	2019	3	2019
Systems Development: AWS / RCI-4 / MAC and Non-Acoustic Enhancements: AWS / RCI-4 / MAC and Non-Acoustic Processing Improvements	1	2019	4	2023
Systems Development: RCI-4 / Theatre ASW Interoperability Improvements: Contract Award	2	2019	2	2019
Systems Development: RCI-4 / Theatre ASW Interoperability Improvements: RCI-4 / Theatre ASW Interoperability Improvements	1	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
9999: *Congressional Adds*	79.441	9.672	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	89.113
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Small Business Technology Insertion	9.672	0.000
FY 2017 Accomplishments: N/A		
FY 2018 Plans: N/A		
Congressional Adds Subtotals	9.672	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not required for Congressional Adds.

E. Performance Metrics

Not required for Congressional Adds.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary HW Dev - NAWCAD	WR	NAWC AD : Patuxent River, MD	1.216	0.030	Sep 2017	0.000		0.000		-		0.000	0.000	1.246	-
Primary HW Dev - Progeny	C/CPFF	PROGENY : Manassas, VA	38.853	9.100	Sep 2017	0.000		0.000		-		0.000	0.000	47.953	47.953
Primary HW Dev - SBIR - Various	Various	Various : Various	31.252	0.000		0.000		0.000		-		0.000	0.000	31.252	-
Primary HD Dev - Prototyping - Various	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Primary HD Dev - Sensor Development	Various	Various : Various	4.800	0.000		0.000		0.000		-		0.000	0.000	4.800	-
		Subtotal	76.121	9.130		0.000		0.000		-		0.000	0.000	85.251	N/A

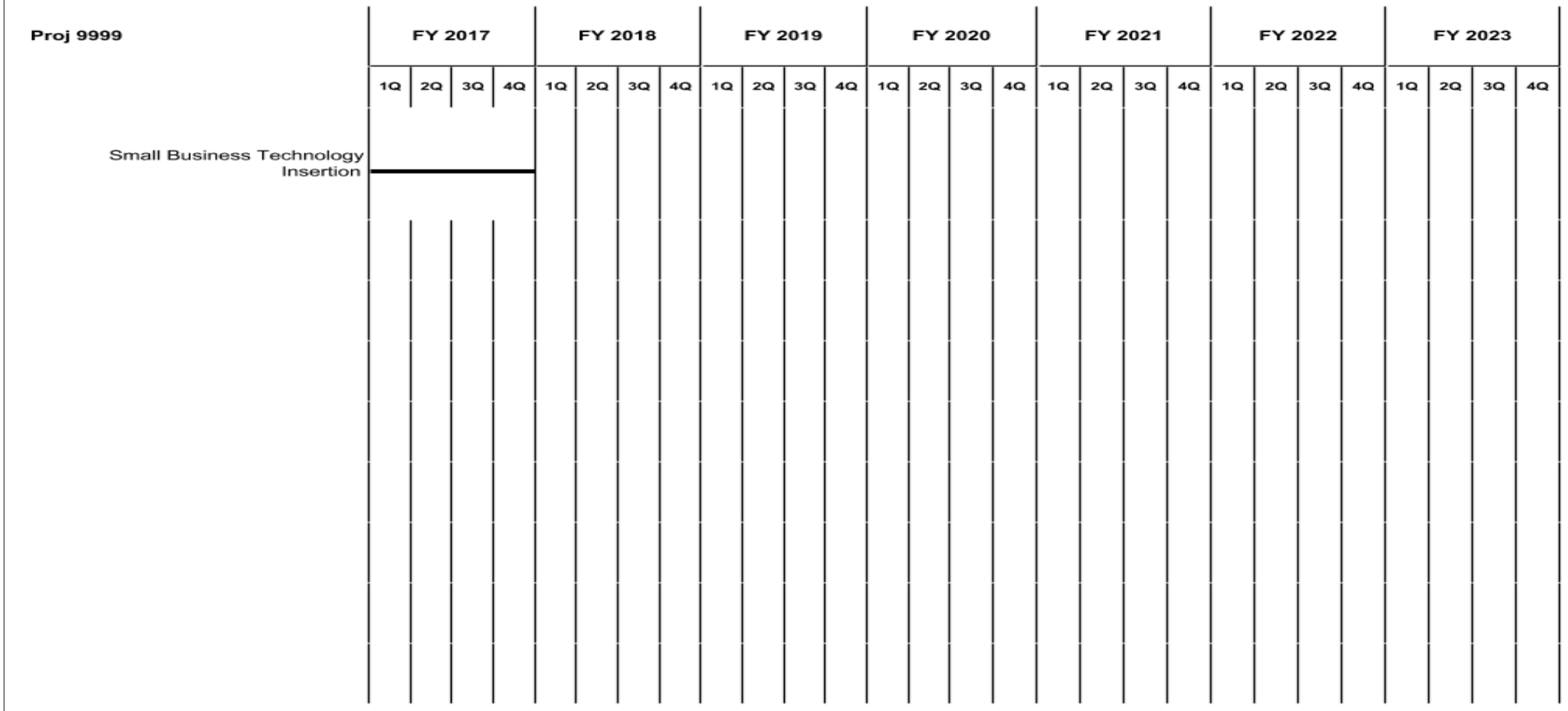
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Services	WR	NAWC AD : Paxtuxent River, MD	0.458	0.000		0.000		0.000		-		0.000	0.000	0.458	-
Mgmt Suppt Serv (NONFFRDC)	C/CPFF	RBC INC : Alexandria, VA	2.862	0.542	Sep 2017	0.000		0.000		-		0.000	0.000	3.404	3.404
		Subtotal	3.320	0.542		0.000		0.000		-		0.000	0.000	3.862	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	79.441	9.672		0.000		0.000		-		0.000	0.000	89.113	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 9999 / *Congressional Adds*



2019OSD - 0605500N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605500N / *Multi-mssn Maritime Aircraft (MMA) (P-8A)*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Small Business Technology Insertion: Schedule Detail	1	2017	4	2017

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605504N *I (U)Multi-Mission Maritime (MMA) Increment III*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	90.101	109.827	181.731	160.389	-	160.389	149.138	150.803	129.001	131.556	Continuing	Continuing
3218: *P-8A Spiral 2 Development*	90.101	109.827	181.731	160.389	-	160.389	149.138	150.803	129.001	131.556	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 334

A. Mission Description and Budget Item Justification

The P-8A Increment 3 program consists of incremental enhancement Engineering Change Proposals (ECPs) to system capabilities that will retain cost-wise effectiveness for major combat operations. Increment 3 will incorporate improvements to aircraft systems including significant war-altering Anti-Submarine Warfare (ASW) capabilities of Enhanced Multi-Static Active Coherent (MAC) and ASW Signal Intelligence (SIGINT) which are enabled by the incorporation of Combat System hardware and architecture improvements, ASW and Anti-Surface Warfare (ASuW) sensor improvements, communication capability upgrades, ASuW Net Enabled Weapon (NEW), and Higher-Than-Secret (HTS) security capability.

These capabilities will be developed as a series of ECPs for the P-8A and are as follows:
- ECP 4 - Software upgrades to Narrowband SATCOM and Radar Targeting. (FIELDED)
- ECP 5 - Net Enabled Weapon Data Link, High Frequency radio Internet Protocol (HF-IP), Integrated Broadcast Service (IBS) filtering, IBS receiver, and Harpoon II+.
- ECP 6 - ASW SIGINT, Anti-Submarine Warfare (ASW) capability, Wide Band SATCOM, Higher Than Secret (HTS) processing, Enhanced track management (Minotaur), Applications Based Architecture (ABA) and Combat System.
- ECP 7 - Enhanced Multi-Static Active Coherent (MAC).

To expedite fielding capability to the P-8A Fleet, ECPs 4, 5, and 6 are executed concurrently as these capabilities are independent of one another. However, Enhanced MAC (ECP 7) is reliant on ECP 6's Combat System hardware and architecture to operate on the P-8A. Both ECP 6 and ECP 7 are integrated via the Platform Integration contract planned to be awarded in FY2018. Enhanced MAC (ECP 7) is developed within Program Element (PE) 0604261N and integrated via the Platform Integration contract within this PE.

Note: This PE has been re-phased due to Congressional adjustments through FY2017.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605504N *I (U)Multi-Mission Maritime (MMA) Increment III*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	182.220	181.731	193.405	-	193.405
Current President's Budget	109.827	181.731	160.389	-	160.389
Total Adjustments	-72.393	0.000	-33.016	-	-33.016
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.489	0.000			
• Program Adjustments	0.000	0.000	-30.800	-	-30.800
• Rate/Misc Adjustments	0.000	0.000	-2.216	-	-2.216
• Congressional General Reductions Adjustments	-0.004	-	-	-	-
• Congressional Directed Reductions Adjustments	-69.900	-	-	-	-

Change Summary Explanation

Technical: Not applicable.

Schedule: Schedule has been updated to reflect the program's re-phased budget due to Congressional adjustments through FY2017.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605504N / *(U)Multi-Mission Maritime (MMA) Increment III*	Project (Number/Name) 3218 / *P-8A Spiral 2 Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3218: *P-8A Spiral 2 Development*	90.101	109.827	181.731	160.389	-	160.389	149.138	150.803	129.001	131.556	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 334

A. Mission Description and Budget Item Justification

The P-8A Increment 3 program consists of incremental enhancement Engineering Change Proposals (ECPs) to system capabilities that will retain cost-wise effectiveness for major combat operations. Increment 3 will incorporate improvements to aircraft systems including significant war-altering Anti-Submarine Warfare (ASW) capabilities of Enhanced Multi-Static Active Coherent (MAC) and ASW Signal Intelligence (SIGINT) which are enabled by the incorporation of Combat System hardware and architecture improvements, ASW and Anti-Surface Warfare (ASuW) sensor improvements, communication capability upgrades, ASuW Net Enabled Weapon (NEW), and Higher-Than-Secret (HTS) security capability.

These capabilities will be developed as a series of ECPs for the P-8A and are as follows:
- ECP 4 - Software upgrades to Narrowband SATCOM and Radar Targeting. (FIELDED)
- ECP 5 - Net Enabled Weapon Data Link, High Frequency radio Internet Protocol (HF-IP), Integrated Broadcast Service (IBS) filtering, IBS receiver, and Harpoon II+.
- ECP 6 - ASW SIGINT, Anti-Submarine Warfare (ASW) capability, Wide Band SATCOM, Higher Than Secret (HTS) processing, Enhanced track management (Minotaur), Applications Based Architecture (ABA) and Combat System.
- ECP 7 - Enhanced Multi-Static Active Coherent (MAC).

To expedite fielding capability to the P-8A Fleet, ECPs 4, 5, and 6 are executed concurrently as these capabilities are independent of one another. However, Enhanced MAC (ECP 7) is reliant on ECP 6's Combat System hardware and architecture to operate on the P-8A. Both ECP 6 and ECP 7 are integrated via the Platform Integration contract planned to be awarded in FY2018. Enhanced MAC (ECP 7) is developed within Program Element (PE) 0604261N and integrated via the Platform Integration contract within this PE.

Note: This PE has been re-phased due to Congressional reductions imposed through FY2017 and pending in FY2018.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	99.148	167.290	137.099	0.000	137.099
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605504N / *(U)Multi-Mission Maritime (MMA) Increment III*	**Project (Number/Name)** 3218 / *P-8A Spiral 2 Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete ECP 4 integration, test, and fielding. Continue ECP-5 integration and test efforts, and its initial fielding. Complete ECP 6 development efforts and initiation of its integration into P-8 test platforms via the Platform Integration (PI) contract with Boeing. Continue Government-led Lead Capability Integrator (LCI) efforts. Continue associated ground support, Tactical Operations Center (TOC), and training systems upgrades. ***FY 2019 Base Plans:*** Complete ECP-5 integration and test efforts, and its fielding. Continue ECP 6 integration activities. Note: ECP 6 enables most of the warfighting capability improvements that Increment 3 brings to the P-8. Continue P-8 LCI efforts. Continue TOC and training systems upgrades. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2019 was decreased due to a re-phasing of the program as a result of the Congressional reductions imposed through FY2017 and pending in FY2018.					
Title: Support/Test & Evaluation/Management Services	10.679	14.441	23.290	0.000	23.290
Articles:	-	-	-	-	-
FY 2018 Plans: Continue associated in-house government Lead Capability Integrator (LCI)/T&E/management activities. ***FY 2019 Base Plans:*** Continue associated in-house government Lead Capability Integrator (LCI)/T&E/management activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase between FY2018 and FY2019 is due to a significant increase in Operational Test (OT) requirements driven by the Harpoon II+ (ECP5) test events plus supporting GFE/test assets.					
Accomplishments/Planned Programs Subtotals	109.827	181.731	160.389	0.000	160.389

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605504N / *(U)Multi-Mission Maritime (MMA) Increment III*	**Project (Number/Name)** 3218 / *P-8A Spiral 2 Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• APN/0586: *P-8 Series*	17.946	18.665	71.251	-	71.251	127.479	230.685	273.973	337.256	1,894.800	3,042.428

Remarks

BLI0586 reflects the P-8A total program funding not just Increment 3.

D. Acquisition Strategy

In 2016 USD AT&L directed Increment 3 efforts to be merged into the P-8 MDAP with capabilities delivered as a series of Engineering Change Proposals (ECPs). Increment 3 capabilities were broken into ECPs 4-7 to expedite delivery to the Fleet. P-8A is an ACAT IC program under the MDA oversight of ASN (RDA). As part of that program Increment 3 is subject to all of the same statutory and regulatory reporting requirements as it would be as a separate MDAP. P-8A completed its most recent annual MDAP Gate 6 review in November 2017. Each Increment 3 ECP is a separate effort with its own development, integration, fielding, and sustainment activities. To explain the separate efforts funding requirements, the Navy provided comprehensive Increment 3 briefing materials to Congressional staffers during the PB18 budget cycle. This information can be updated to reflect PB19 as requested.

E. Performance Metrics

Continue development of capability ECPs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605504N / *(U)Multi-Mission Maritime (MMA) Increment III*	**Project (Number/Name)** 3218 / *P-8A Spiral 2 Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hdw Dev - RR Interface	C/CPIF	Boeing : Seattle, WA	5.803	0.000		0.000		0.000		-		0.000	0.000	5.803	5.803
Primary HW Dev - Capability Analysis	C/CPFF	Boeing : Seattle, WA	8.917	0.000		0.000		0.000		-		0.000	0.000	8.917	8.917
Primary HW Dev - Capability Dev & Integration	C/CPFF	Boeing : Seattle, WA	14.225	36.401	Oct 2016	58.589	Oct 2017	18.418	Oct 2018	-		18.418	0.000	127.633	127.633
Primary HW Dev - Trainer Dev & Integration	TBD	Boeing : St. Louis, MO	0.000	0.000		2.000	Nov 2017	5.000	Nov 2018	-		5.000	83.413	90.413	-
Primary HW Dev - ABA SW Dev Vendor A	C/CPIF	Raytheon : Dallas, TX	5.870	0.116	Dec 2017	0.000		0.000		-		0.000	0.000	5.986	5.986
Primary HW Dev - ABA SW Dev Vendor B	C/CPIF	Lockheed Martin : Manassas, VA	6.442	3.644	Oct 2016	0.000		0.000		-		0.000	0.000	10.086	10.086
Primary HW Dev - Combat Systems Hardware Effort	Various	NSWC : Crane, IN	0.000	5.450	Jun 2017	23.594	Oct 2017	23.803	Oct 2018	-		23.803	20.000	72.847	-
Primary HW Dev - Platform Integration	C/CPFF	Boeing : Seattle, WA	0.000	0.000		45.212	Jun 2018	45.330	Oct 2018	-		45.330	251.861	342.403	342.403
Primary HW Dev - Wideband SATCOM Terminal	C/CPFF	AMEWAS : California, MD	3.942	2.830	Oct 2016	0.000		0.000		-		0.000	0.000	6.772	6.772
RCI2 - ECP3	C/CPFF	Boeing : Seattle, WA	14.317	3.000	Oct 2016	0.000		0.000		-		0.000	0.000	17.317	17.317
LCI Development & Integration	Various	Various : Various	15.851	28.972	Oct 2016	23.240	Oct 2017	27.284	Oct 2018	-		27.284	98.889	194.236	-
Sys Eng (gov)	WR	NAWC AD : Pax River, MD	7.484	18.735	Nov 2016	14.655	Nov 2017	17.264	Nov 2018	-		17.264	69.291	127.429	-
		Subtotal	82.851	99.148		167.290		137.099		-		137.099	523.454	1,009.842	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605504N / *(U)Multi-Mission Maritime (MMA) Increment III*	Project (Number/Name) 3218 / *P-8A Spiral 2 Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Sup	WR	NAWC AD : Pax River, MD	0.605	1.095	Nov 2016	0.356	Nov 2017	0.918	Nov 2018	-		0.918	3.672	6.646	-
Studies & Analysis	C/CPFF	JHU : Pax River, MD	3.345	3.372	Nov 2016	2.232	Nov 2017	2.250	Nov 2018	-		2.250	0.000	11.199	11.199
		Subtotal	3.950	4.467		2.588		3.168		-		3.168	3.672	17.845	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Dev Test & Eval	WR	NAWC AD : Pax River, MD	1.266	3.768	Nov 2016	8.738	Nov 2017	8.879	Nov 2018	-		8.879	65.080	87.731	-
GFE/GFI/GFP	WR	NAWC AD : Pax River, MD	0.022	1.193	Nov 2016	1.753	Nov 2017	5.590	Nov 2018	-		5.590	32.764	41.322	-
Oper Test & Eval	WR	NAWC AD : Pax River, MD	0.000	0.000		0.000		1.574	Nov 2018	-		1.574	26.533	28.107	-
Test Assets	WR	NAWC AD : Pax River, MD	0.000	0.000		0.000		1.137	Nov 2018	-		1.137	22.478	23.615	-
		Subtotal	1.288	4.961		10.491		17.180		-		17.180	146.855	180.775	N/A

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Eng Tech Serv (NON-FFRDC)	C/CPFF	Various : Various	0.118	0.000	Nov 2016	0.072	Nov 2017	0.000	Nov 2018	-		0.000	Continuing	Continuing	Continuing
Mgmt Suppt Serv (NON-FFRDC)	C/CPFF	RBC : Alexandria, VA	1.199	0.797	Nov 2016	0.590	Nov 2017	2.134	Nov 2018	-		2.134	6.208	10.928	10.928
Program Mgmt Support	WR	NAWC AD : Pax River, MD	0.688	0.437	Nov 2016	0.600	Nov 2017	0.708	Nov 2018	-		0.708	2.657	5.090	-
Travel	Allot	NAWC AD : Pax River, MD	0.007	0.017	Nov 2016	0.100	Nov 2017	0.100	Nov 2018	-		0.100	0.500	0.724	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605504N / *(U)Multi-Mission Maritime (MMA) Increment III*	**Project (Number/Name)** 3218 / *P-8A Spiral 2 Development*

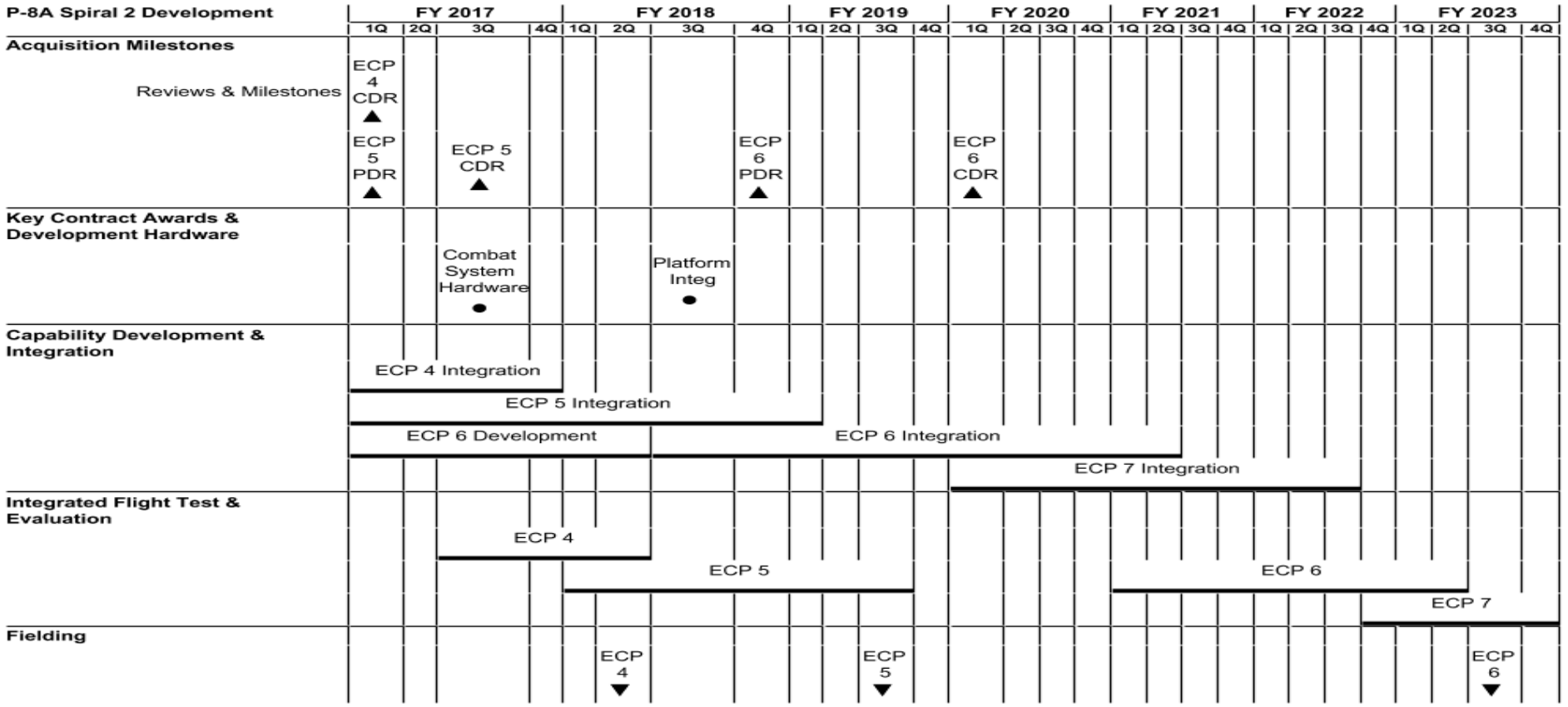
Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Subtotal	2.012	1.251		1.362		2.942		-		2.942	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	90.101	109.827		181.731		160.389		-		160.389	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605504N / *(U)Multi-Mission Maritime (MMA) Increment III*	**Project (Number/Name)** 3218 / *P-8A Spiral 2 Development*



2019PB - 0605504N - 3218

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605504N / *(U)Multi-Mission Maritime (MMA) Increment III*	**Project (Number/Name)** 3218 / *P-8A Spiral 2 Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
P-8A Spiral 2 Development				
Acquisition Milestones: Reviews & Milestones: ECP 4 Critical Design Review (CDR)	1	2017	1	2017
Acquisition Milestones: Reviews & Milestones: ECP 5 Preliminary Desgin Review (PDR)	1	2017	1	2017
Acquisition Milestones: Reviews & Milestones: ECP 5 Critical Design Review (CDR)	3	2017	3	2017
Acquisition Milestones: Reviews & Milestones: ECP 6 Preliminary Design Review (PDR)	4	2018	4	2018
Acquisition Milestones: Reviews & Milestones: ECP 6 Critical Design Review (CDR)	1	2020	1	2020
Key Contract Awards & Development Hardware: Combat System Hardware	3	2017	3	2017
Key Contract Awards & Development Hardware: Platform Integration	3	2018	3	2018
Capability Development & Integration: ECP 4 Integration	1	2017	4	2017
Capability Development & Integration: ECP 5 Integration	1	2017	1	2019
Capability Development & Integration: ECP 6 Development	1	2017	2	2018
Capability Development & Integration: ECP 6 Integration	3	2018	2	2021
Capability Development & Integration: ECP 7 Integration	1	2020	3	2022
Integrated Flight Test & Evaluation: ECP 4	3	2017	2	2018
Integrated Flight Test & Evaluation: ECP 5	1	2018	3	2019
Integrated Flight Test & Evaluation: ECP 6	1	2021	2	2023
Integrated Flight Test & Evaluation: ECP 7	4	2022	4	2023
Fielding: ECP 4	2	2018	2	2018
Fielding: ECP 5	3	2019	3	2019
Fielding: ECP 6	3	2023	3	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605611M *I (U) MC AVS Development & Demonstration*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	178.993	98.223	-	98.223	77.681	57.939	43.533	8.341	Continuing	Continuing
0025: *Amphibious Combat Vehicle 1.1*	0.000	0.000	178.993	42.448	-	42.448	19.703	0.462	0.000	0.000	0.000	241.606
0026: *Amphibious Combat Vehicle 1.2*	0.000	0.000	0.000	55.775	-	55.775	57.978	57.477	43.533	8.341	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** P472												

Note

Beginning in FY 2018, the program funding transitions from Program Element 0603611M Marine Corps Assault Vehicles to Program Element 0605611M MC AVS Development and Demonstration as the program proceeds through the acquisition process.

A. Mission Description and Budget Item Justification

The Amphibious Combat Vehicle is an armored personnel carrier, balanced in performance, protection, and payload for employment within the Ground Combat Element (GCE) and throughout the range of military operations, to include a swim capability.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	178.993	79.782	-	79.782
Current President's Budget	0.000	178.993	98.223	-	98.223
Total Adjustments	0.000	0.000	18.441	-	18.441
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	19.323	-	19.323
• Rate/Misc Adjustments	0.000	0.000	-0.882	-	-0.882

Change Summary Explanation

The decrease from FY 2018 to FY 2019 ($80.77) is primarily attributed to the completion of two competitive Engineering and Manufacturing Development (EMD) contracts and subsequent down-select to one prime contract, the completion of Full-Up System Level (FUSL) vehicle procurement, and to the completed

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605611M *I (U) MC AVS Development & Demonstration*

procurement of Government Furnished Equipment for FUSL test articles in FY 2018. In addition, Amphibious Combat Vehicle (ACV) 1.2 funding, project unit 0026, begins in FY 2019.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605611M / *(U) MC AVS Development & Demonstration*	Project (Number/Name) 0025 / *Amphibious Combat Vehicle 1.1*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0025: *Amphibious Combat Vehicle 1.1*	0.000	0.000	178.993	42.448	-	42.448	19.703	0.462	0.000	0.000	0.000	241.606
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P472

Note

Beginning in FY 2018, the program funding transitions from Program Element 0603611M Marine Corps Assault Vehicles to Program Element 0605611M MC AVS Development and Demonstration as the program proceeds through the acquisition process.

The decrease in ACV 1.1 from FY 2018 to FY 2019 ($136.545) is primarily attributed to the completion of two competitive Engineering and Manufacturing Development (EMD) contracts and subsequent down-select to one prime contract, the completion of Full-Up System Level (FUSL) vehicle procurement, and to the completed procurement of Government Furnished Equipment for FUSL test articles in FY 2018.

A. Mission Description and Budget Item Justification

The Amphibious Combat Vehicle (ACV) will be a partial and complementary replacement for the legacy Assault Amphibious Vehicle (AAV) battalions within the Marine Divisions. ACV-equipped AA companies will provide protected mobility and general support lift to elements of Marine Infantry Battalions. The ACV, an advanced generation, eight-wheeled armored personnel carrier, will mitigate current and projected capability gaps by providing improved lethality against dismounted enemy troops, more effective land and water tactical mobility, and increased force protection and survivability from blast, fragmentation, and kinetic energy threats. The ACV program is structured to be executed in multiple phases, with the first phase designed to provide an initial operational capability of personnel carriers. Subsequent phases are planned to expand the personnel carrier capacity and to develop additional command and control and tactical recovery capabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	0.000	138.834	21.993	0.000	21.993
Articles:	-	4	-	-	-
Description: System Design and Development; Engineering and Manufacturing Development (EMD) test vehicle manufacturing; prime contractor Developmental and Operational test, and development of Logistics Management Information (LMI) data.					
FY 2018 Plans: - Complete contractor competitive EMD Developmental Test activities. - Continue corrective action modifications which resulted from Reliability Growth Testing (RGT).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Procure 4 FUSL Live Fire vehicles. - Procure GFE communication suites and Amphibious Remote Weapon Stations (ARWS) for FUSL test articles. - Initiate advance capabilities improvements, Developmental Test (DT), Operational Assessment (OA), and Live Fire Test & Evaluation (LFT&E) support for the down-selected contractor. ***FY 2019 Base Plans:*** - Complete corrective action modifications which resulted from Reliability Growth Testing (RGT). - Continue advance capabilities improvements, DT, Operational Test & Evaluation (OT&E), and LFT&E support for the down-selected contractor. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease in System Design & Development from FY 2018 to FY 2019 ($116.841) is attributed to the completion of two competitive EMD contracts ($86.812), completion of Full-Up System Level (FUSL) test vehicle procurement ($23.385), completion of procurement of Government Furnished Equipment (GFE)in FY 2018 for FUSL test articles ($2.546), and the remaining difference is in the reduced value of the system design and development between FY 2018 and FY 2019 ($4.098) as the program progresses.					
Title: Management Services	0.000	7.242	3.461	0.000	3.461
Articles:	-	-	-	-	-
Description: Contract Advisory and Assistance Services (Engineering and Technical Support, Management Support Services, and Studies and Analyses). ***FY 2018 Plans:*** - Continue business, acquisition, logistics, and engineering related activities for program document development, program analysis, acquisition logistics management, and financial management support. - Continue engineering and technical services for Amphibious Remote Weapon Station (ARWS), logistical, maintenance support, and integration. - Continue force protection modeling and simulation activities. - Continue analyses of product support elements to support Maintenance Plan development, Support and Test Equipment, Calibration, and other logistics elements. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue business, acquisition, logistics, and engineering related activities for program document development, program analysis, acquisition logistics management, and financial management support. - Continue engineering and technical services for logistical, maintenance support, and integration. - Continue force protection modeling and simulation activities. - Continue analyses of product support elements to support Maintenance Plan development, Support and Test Equipment, Calibration, and other logistics elements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease in Management Support Services from FY 2018 to FY 2019 ($3.781) is primarily attributed completion of ACV 1.1 EMD phase and allocation of a greater portion of Management Support Services to the PMC appropriation based on the transition to procurement phase of the system life cycle.					
Title: Program Support ***Articles:*** ***Description:*** Government labor, material, and travel for Integrated Logistics Support, Technical Publications, Support Equipment development, In-house Technical Support, and Program Management Support. ***FY 2018 Plans:*** - Complete ARWS marinization and integration support. - Continue Engineering Support for communication suite integration efforts documented during technical information and review meetings. - Continue procurement, inventory, checkout, kitting, shipment, and troubleshooting of ACV 1.1 communications suite Government Furnished Property (GFP) for FUSL test vehicles. - Continue Reliability, Availability, Maintainability, and Durability (RAM-D), and Human Systems Integration (HSI) activities for ACV 1.1. - Continue Digital Integrated Facility (DIF) architecture support. - Continue technical support for training packages. - Initiate development of Training Devices/Simulators for ACV 1.1. ***FY 2019 Base Plans:*** - Continue Engineering Support for communication suite integration efforts documented during technical information and review meetings.	0.000 -	7.620 -	3.433 -	0.000 -	3.433 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue procurement, inventory, checkout, kitting, shipment, and troubleshooting of ACV 1.1 communications suite GFP - Continue RAM-D, and HSI for ACV 1.1. - Continue DIF architecture support. - Continue technical support for training packages. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease in Program Support from FY 2018 to FY 2019 ($4.187) is primarily due to the decrease in Training Devices/Simulators ($2.286) for which development continues under ACV 1.2, due to the completion of Amphibious Remote Weapons Station (ARWS) marinization and integration support ($1.810).					
Title: Test & Evaluation	0.000	25.297	13.561	0.000	13.561
Articles:	-	-	-	-	-
Description: Government Developmental Test (DT), Operational Assessment (OA), and Live Fire Test and Evaluation (LFT&E) activities. ***FY 2018 Plans:*** - Continue LFT&E activities (armor coupon testing, exploitation shots, fire survivability, system level testing, etc.) for competitive contractor designs. - Continue Developmental Testing. - Initiate and complete Operational Assessment (OA). ***FY 2019 Base Plans:*** - Continue LFT&E activities (armor coupon testing, exploitation shots, fire survivability, system level testing, etc.) for down-selected contractor. - Continue Developmental Testing for down-selected contractor. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The Decrease in Test and Evaluation from FY 2018 to FY 2019 ($11.736) is attributed to the completion of the competitive portion of DT and Cold weather climatic testing.					
Accomplishments/Planned Programs Subtotals	0.000	178.993	42.448	0.000	42.448

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/2025: *Amphibious Combat Vehicle 1.1*	0.000	161.511	167.478	-	167.478	286.098	507.400	0.000	0.000	0.000	1,122.487
• PMC/7000/0206211M/1: *Initial Spares - ACV 1.1*	0.000	5.569	6.145	-	6.145	13.960	13.643	0.000	0.000	0.000	39.317
• RDTEN/0603611M/0025: *Marine Corps Assault Vehicles*	131.381	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	557.610
• RDTE/0605611M/0026: *Amphibious Combat Vehicle 1.2*	0.000	0.000	55.775	-	55.775	57.978	57.477	43.533	8.341	Continuing	Continuing
• PMC/2026: *Amphibious Combat Vehicle 1.2*	0.000	0.000	0.000	-	0.000	0.000	0.000	710.373	701.456	Continuing	Continuing
• PMC/7000/0206211M: *Initial Spares - ACV 1.2*	0.000	0.000	0.000	-	0.000	0.000	0.000	19.346	19.773	Continuing	Continuing

Remarks

D. Acquisition Strategy

The program office awarded two competitive Engineering and Manufacturing Development (EMD) contracts to two vendors to build 16 vehicles each (32 total). ACV Increment 1.1 entered the acquisition cycle at Milestone B in FY 2016 and will down-select to one vendor at Milestone C. In FY 2018, the program will enter into Low Rate Initial Production (LRIP) and Full Rate Production (FRP) will begin in FY 2020.

E. Performance Metrics

Milestone Reviews
Milestone B: 1QFY16
Milestone C: 3QFY18

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Design &Development	C/FPIF	Various : Various	0.000	0.000		136.288	Jan 2018	21.993	Jan 2019	-		21.993	0.000	158.281	-
Other Product Devolpment	C/FFP	SPAWAR : New Jersey/Charleston/ Picatinny	0.000	0.000		2.546	Jan 2018	0.000		-		0.000	0.000	2.546	-
		Subtotal	0.000	0.000		138.834		21.993		-		21.993	0.000	160.827	N/A

Remarks

- The decrease in System Design & Development between FY 2018 & FY 2019 ($114.295) is attributed to the completion the competitive EMD phase with two vendors ($86.812), completion of procurement of Full-Up System Level (FUSL) test vehicles ($23.385), and the remaining difference is in the reduced value of the system design and development between FY 2018 and FY2019 ($4.098) as the program progresses.
- The decrease in Other Product Development between FY 2018 & FY 2019 ($2.546) is attributed to the completed purchase of GFE (Communication Suites and Amphibious Remote Weapons Stations (ARWS)) for FUSL test purposes in FY 2018.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	WR	NSWC-Dahlgren : Dahlgren, VA	0.000	0.000		0.425	Apr 2018	0.986	Apr 2019	-		0.986	0.000	1.411	-
Technical Data & Pubs Development	WR	SPAWAR : Charleston, SC	0.000	0.000		0.100	Sep 2018	0.100	Sep 2019	-		0.100	0.000	0.200	-
GFP Management	WR	SPAWAR : Charleston, SC	0.000	0.000		4.687	Apr 2018	2.213	Apr 2019	-		2.213	0.000	6.900	-
Training Devices/ Simulators	TBD	TBD : TBD	0.000	0.000		2.286	Apr 2018	0.000		-		0.000	0.000	2.286	-
Travel	Various	Various : Various	0.000	0.000		0.122	Sep 2018	0.134	Sep 2019	-		0.134	0.000	0.256	-
		Subtotal	0.000	0.000		7.620		3.433		-		3.433	0.000	11.053	N/A

Remarks

- The increase in Integrated Logistics Support between FY 2018 and FY 2019 ($0.561) is attributed to calibration requirements analyses and Operational and Maintainability Logistics demonstrations in FY 2019.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
- The decrease in GFP Management between FY 2018 & FY 2019 ($2.474) is attributed to completion of Amphibious Remote Weapons Station (ARWS) marinization and integration support. - The decrease in Training Devices/Simulators between FY 2018 & FY 2019 ($2.286) is attributed to the plan to continue to develop training devices/simulators under the auspices of ACV 1.2 for the system as a whole.															

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test & Evaluation	WR	Various : Various	0.000	0.000		15.081	Jan 2018	3.268	Jan 2019	-		3.268	0.000	18.349	-
Operational Test & Evaluation	WR	MCOTEA : Quantico,VA	0.000	0.000		2.348	Jan 2018	2.098	Jan 2019	-		2.098	0.000	4.446	-
Live Fire Test & Evaluation	WR	Various : Various	0.000	0.000		7.868	Jan 2018	8.195	Jan 2019	-		8.195	0.000	16.063	-
		Subtotal	0.000	0.000		25.297		13.561		-		13.561	0.000	38.858	N/A

Remarks

- The decrease in Developmental Test & Evaluation between FY 2018 & FY 2019 ($11.813) is attributed to the completion of competitive DT execution and reporting activities and Cold weather climatic testing.
- The decrease in Operational Test & Evaluation between FY 2018 and FY 2019 ($0.250) is attributed to the completion of Operational Assessment (OA).
- The increase in Live Fire Test & Evaluation between FY 2018 & FY 2019 ($0.327) is primarily attributed to shifting from Live Fire planning and preparation efforts in FY 2018 to Live Fire test event execution in FY 2019.

* The FY 2018 award date for cost categories with various activities is the actual obligation date for the last award in the category.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Technical Services	C/FFP	Various : Various	0.000	0.000		0.900	Jul 2018	0.846	Jul 2019	-		0.846	0.000	1.746	-
Management Support Services	C/FFP	DDG : Stafford, VA	0.000	0.000		6.042	Mar 2018	2.315	Mar 2019	-		2.315	0.000	8.357	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Force Protection Studies and Analysis	C/FFP	Various : Various	0.000	0.000		0.300	Jul 2018	0.300	Jun 2019	-		0.300	0.000	0.600	-
		Subtotal	0.000	0.000		7.242		3.461		-		3.461	0.000	10.703	N/A

Remarks

- The decrease in Management Support Services between FY 2018 & FY 2019 ($3.781) is attributed to the completion of ACV 1.1 EMD Phase and allocation of a greater portion of Management Support Services to the PMC appropriation based on the transition to the procurement phase of the system life cycle.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		178.993		42.448		-		42.448	0.000	221.441	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

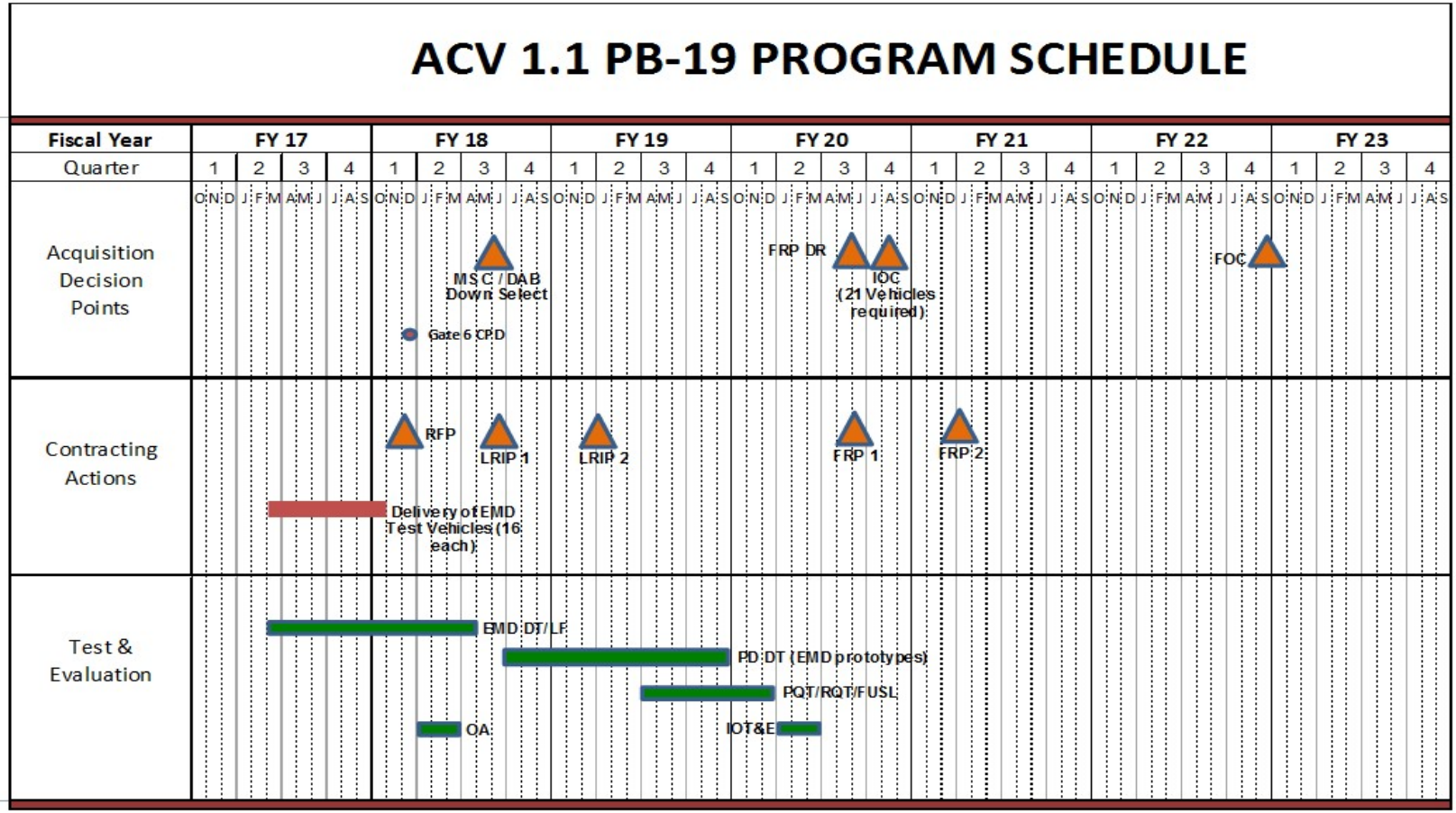


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0025 / *Amphibious Combat Vehicle 1.1*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0025				
EMD Vehicle Delivery (32 Vehicles)	2	2017	1	2018
Vehicle Acceptance Review	2	2017	1	2018
Development Test/Live Fire Test	2	2017	1	2020
Tactics, Techniques, and Procedures (TTP) Development	3	2017	4	2017
Production Readiness Review (PRR)	1	2018	1	2018
Operational Assessment (OA)	2	2018	3	2018
System Verification Review (SVR)	2	2018	2	2018
JROC Capabilities Production Document (CPD)	3	2018	3	2018
MS C/DAB Down Select	3	2018	3	2018
LRIP Option 1 Exercised	3	2018	3	2018
Physical Configuration Audit (PCA)	4	2019	4	2019
LRIP Option 2 Exercised	2	2019	2	2019
Initial Operational Test & Evaluation (IOT&E)	2	2020	2	2020
Full Rate Production (FRP) Decision	3	2020	3	2020
FRP #1 Option Exercised	3	2020	3	2020
Initial Operational Capability (IOC)	4	2020	4	2020
FRP #2 Option Exercised	2	2021	2	2021
Full Operational Capability (FOC)	4	2022	4	2022
Gate 6 Capabilities Production Document (CPD)	1	2018	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605611M / *(U) MC AVS Development & Demonstration*	Project (Number/Name) 0026 / *Amphibious Combat Vehicle 1.2*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
0026: *Amphibious Combat Vehicle 1.2*	0.000	0.000	0.000	55.775	-	55.775	57.978	57.477	43.533	8.341	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Amphibious Combat Vehicle (ACV) will be a partial and complementary replacement for the legacy Amphibious Assault Vehicle (AAV) battalion's within the Marine Divisions. ACV-equipped AA companies will provide protected mobility and general support lift to elements of Marine Infantry Battalions. The ACV, an advanced generation, eight-wheeled armored personnel carrier, will mitigate current and projected capability gaps by providing improved lethality against dismounted enemy troops, more effective land and water tactical mobility, and increased force protection and survivability from blast, fragmentation, and kinetic energy threats. The ACV program is structured to be executed in multiple phases, with the first phase designed to provide an initial operational capability of personnel carriers. Subsequent phases are planned to expand the personnel carrier capacity and to develop additional command and control and tactical recovery capabilities. ACV 1.2 will provide the Marine Corps with armored protected land mobility to effectively maneuver with the rest of the armored MAGTF, the direct fire lethality to support infantry maneuver, and the water mobility to self-deploy from amphibious shipping. In addition to fielding more ACV Personnel variants, ACV 1.2 will develop and field Command & Control and Recovery variants.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Developmemt	0.000	0.000	49.293	0.000	49.293
Articles:	-	-	4	-	4
Description: System Design and Development; Engineering and Manufacturing Development (EMD) test vehicle manufacturing; prime contractor Developmental and Operational test, and development of Logistics Management Information (LMI) data.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: - Initiate Trade Studies and design efforts. - Initiate conversion of four (4) ACV 1.1 Personnel-variant Engineering and Manufacturing Development (EMD) Prototypes into three (3) ACV 1.2 Personnel-variant and one (1) ACV 1.2 Command-variant configurations. - Initiate Systems Engineering/Program Management for Prime Contractor. - Initiate Vehicle Protection System (VPS) design and integration for Prime Contractor.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0026 / *Amphibious Combat Vehicle 1.2*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate Prime Contractor training. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase between FY 2018 and FY 2019 ($49.293) is required for the Prime Contractor to design and develop the new Command and Control (C2) and Recovery variants and to modify the ACV 1.1 Personnel test vehicles into the ACV 1.2 configurations.					
Title: Program Support ***Articles:*** ***Description:*** Government Labor, material, and travel for Integrated Logistics Support, Technical Publications, Support Equipment development, In-house Technical Support, and Program Management support. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** - Initiate technical support for Armor Characterization efforts. - Initiate technical support for Modular Active Protection Systems (MAPS) integration. - Initiate training devices and simulators design and development. - Initiate development of technical data and publications. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase between FY 2018 and FY 2019 ($3.393) is primarily required to initiate Training Devices and Simulators ($2.286) for ACV 1.2 and to initiate technical support for Armor Characterization ($0.245) and Modular Active Protection Systems (MAPS)($0.250).	0.000 -	0.000 -	3.393 -	0.000 -	3.393 -
Title: Management Services ***Articles:*** ***Description:*** Contract Advisory and Assistance Services (Engineering and Technical Support, Management Support Services, and Studies and Analyses).	0.000 -	0.000 -	3.089 -	0.000 -	3.089 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0026 / *Amphibious Combat Vehicle 1.2*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** - Initiate business, acquisition, logistics, and engineering related activities for program document development, program analysis, acquisition logistics management, and financial management support. - Initiate Studies and Analysis. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase between FY 2018 and FY 2019 ($3.089) is primarily required to initiate business acquisition, logistics, and engineering related activities to support program document development, program analysis, acquisition logistics management, and financial management support for ACV 1.2 ($2.789).					
Accomplishments/Planned Programs Subtotals	0.000	0.000	55.775	0.000	55.775

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/2025: *Amphibious Combat Vehicle 1.1*	0.000	161.511	167.478	-	167.478	286.098	507.400	0.000	0.000	0.000	1,122.487
• PMC/2026: *Amphibious Combat Vehicle 1.2*	0.000	0.000	0.000	-	0.000	0.000	0.000	710.373	701.456	Continuing	Continuing
• PMC/2025/7000: *Initial Spares 1.1*	0.000	5.569	6.145	-	6.145	13.960	13.643	0.000	0.000	0.000	39.317
• PMC/2026/7000: *Initial Spares 1.2*	0.000	0.000	0.000	-	0.000	0.000	0.000	19.346	19.773	Continuing	Continuing
• RDTE/0605611/0025: *Amphibious Combat Vehicle 1.1*	131.380	178.993	42.448	-	42.448	19.703	0.462	0.000	0.000	0.000	372.986

Remarks

D. Acquisition Strategy

The ACV Program Increment 1.2 will improve Personnel carrier capabilities over Increment 1.1 and will deliver Command and Control (C2) and Recovery Mission Role Variants (MRVs). The development acquisition approach for ACV 1.2 will be streamlined by modifying ACV 1.1 Engineering and Manufacturing Development (EMD) vehicles to an ACV 1.2 configuration. Areas of improvement for the ACV 1.2 personnel variant will be focused on changes resulting from ACV 1.1 performance during

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0026 / *Amphibious Combat Vehicle 1.2*

development testing and the operational assessment. This strategy will maximize the use of current ACV 1.1 vehicles and provide integration of the latest standard government furnished communications, weapons, sensors etc. This approach will minimize program cost, schedule, and performance risks, minimize development costs and provide rapid fielding of current capabilities to meet operational requirements. Specifically, the ACV Program Office plans to initially procure 422 ACV 1.2 Personnel carriers immediately following the completion of ACV 1.1 production with 68 Mission Role Variants being delivered near the end of the production timeframe.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605611M / *(U) MC AVS Development & Demonstration*	Project (Number/Name) 0026 / *Amphibious Combat Vehicle 1.2*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Design & Development	C/CPFF	TBD : TBD	0.000	0.000		0.000		49.293	Jan 2019	-		49.293	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		49.293		-		49.293	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.425	Apr 2019	-		0.425	Continuing	Continuing	Continuing
Training Decives/ Simulators	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		2.286	Apr 2019	-		2.286	Continuing	Continuing	Continuing
Technical Data & Pubs Development	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.100	Jan 2019	-		0.100	Continuing	Continuing	Continuing
In-House Technical Support	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.495	May 2019	-		0.495	Continuing	Continuing	Continuing
Travel	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.087	Sep 2019	-		0.087	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		3.393		-		3.393	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation (DT&E)	Various	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational Test & Evaluation (OT&E)	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Live Fire Test & Evaluation (LFT&E)	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605611M / *(U) MC AVS Development & Demonstration*	Project (Number/Name) 0026 / *Amphibious Combat Vehicle 1.2*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering and Technical Services	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Management Support Services	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		2.789	Mar 2019	-		2.789	Continuing	Continuing	Continuing
Studies and Analysis	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.300	Jul 2019	-		0.300	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		3.089		-		3.089	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		55.775		-		55.775	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0026 / *Amphibious Combat Vehicle 1.2*

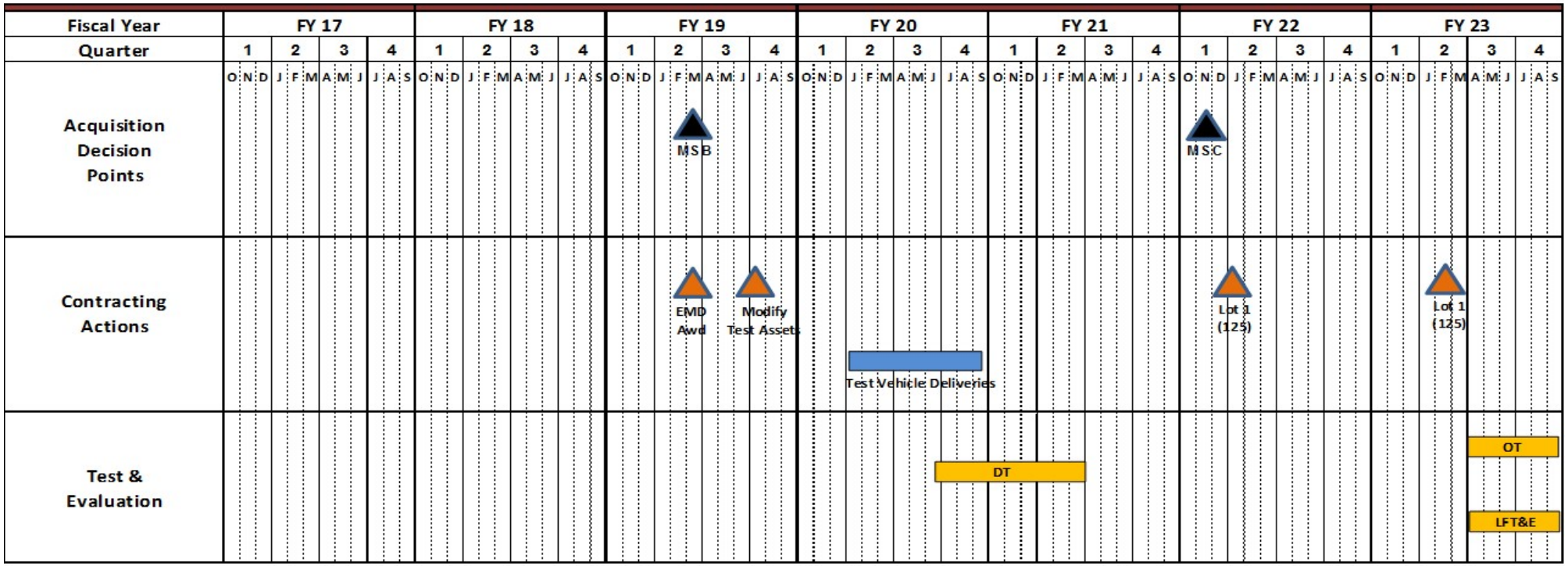


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605611M / *(U) MC AVS Development & Demonstration*	**Project (Number/Name)** 0026 / *Amphibious Combat Vehicle 1.2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0026				
MROC DRAFT CDD	1	2018	1	2018
JROC CDD	1	2019	1	2019
MS B	2	2019	2	2019
EMD Award	2	2019	2	2019
Modify Test Assets	4	2019	4	2019
Developmental Test & Evaluation (DT&E)	3	2020	2	2021
Release Production RFP	2	2021	3	2021
CPD	3	2021	3	2021
MS C	1	2022	1	2022
Lot 1 Contract Award (125 vehicles)	2	2022	2	2022
Lot 1 Production	2	2022	2	2023
Lot 2 Contract Award (125 vehicles)	2	2023	2	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605813M *I (U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	0.000	20.710	2.260	-	2.260	2.122	0.026	0.024	0.022	Continuing	Continuing
3209: *Joint Light Tactical Vehicle*	0.000	0.000	20.710	2.260	-	2.260	2.122	0.026	0.024	0.022	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 279												

Note

The FY 2011 NDAA directed the Services to separate the Joint Light Tactical Vehicle (JLTV) program into distinct PEs to provide Congress with increased transparency and allow for more effective oversight. Transition of funding from PE 0603635M to PE 0605812M was effective beginning in FY 2013.

Beginning in FY18, program funding transitioned from Budget Activity 4, Program Element 0605812M Joint Light Tactical Vehicle (JLTV) EMD to account for program progression through the acquisition process.

A. Mission Description and Budget Item Justification

Funding supports the development and testing of the JLTV Family of Vehicles (FoV). JLTV is a joint program between the U.S. Army and the U.S. Marine Corps, of which the U.S. Army is the lead service. JLTV is a FoV capable of performing multiple mission roles designed to provide protected, sustained, and networked mobility for personnel and payloads across the full Range of Military Operations (ROMO). JLTV objectives include increased performance, protection, and payload over the current legacy HMMWV fleet, minimizing ownership costs by maximizing commonality, fuel efficiency and reliability. The commonality of components, maintenance procedures, training, etc, among vehicles is expected to be inherent in FoV solutions across mission variants to minimize total ownership cost. Unique service requirements have been minimized.

Major FY19 budget activities include the continuation of systems integration activity at the Government Systems Integration Laboratory and program management support to evaluate future integration and C4I requirements.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605813M *I (U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	20.710	2.280	-	2.280
Current President's Budget	0.000	20.710	2.260	-	2.260
Total Adjustments	0.000	0.000	-0.020	-	-0.020
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.020	-	-0.020

Change Summary Explanation

NOTE: The funding decrease from FY2018 to FY2019 of $18.450M is due to the conclusion of planned test events in accordance with the approved program Test and Evaluation Master Plan (TEMP) and test support requirements in accordance with the JLTV production contract.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	Project (Number/Name) 3209 / *Joint Light Tactical Vehicle*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3209: *Joint Light Tactical Vehicle*	0.000	0.000	20.710	2.260	-	2.260	2.122	0.026	0.024	0.022	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 279

Note

Beginning in FY18, program funding transitioned from Budget Activity 4 Program Element 0605812M Joint Light Tactical Vehicle (JLTV) EMD to account for advancement through the acquisition process.

The funding decrease from FY2018 to FY2019 of $18.450 is due to the conclusion of planned test events in accordance with the approved program Test and Evaluation Master Plan (TEMP) and test support requirements in accordance with the JLTV production contract.

A. Mission Description and Budget Item Justification

Funding supports the development and testing of the JLTV Family of Vehicles (FoV). JLTV is a joint program between the U.S. Army and the U.S. Marine Corps, of which the U.S. Army is the lead service. JLTV is a FoV capable of performing multiple mission roles designed to provide protected, sustained, and networked mobility for personnel and payloads across the full Range of Military Operations (ROMO). JLTV objectives include increased performance, protection, and payload over the current legacy HMMWV fleet, minimizing ownership costs by maximizing commonality, fuel efficiency and reliability. The commonality of components, maintenance procedures, training, etc, among vehicles is expected to be inherent in FoV solutions across mission variants to minimize total ownership cost. Unique service requirements have been minimized.

Major FY19 budget activities include the continuation of systems integration activity at the Government Systems Integration Laboratory and program management support to evaluate future integration and C4I requirements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Live Fire Test Support	0.000	5.296	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete planned test events to include FUSL, MOT&E, Logistics Demonstration, AFES, C4I, and corrosion. -Complete vendor RDT&E activity on the LRIP contract. -Complete logistics support of GFE required for LF Test events.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** -The decrease between FY2018 and FY2019 of $5.296M is a result of the conclusion of test support requirements in accordance with the JLTV production contract.					
Title: GFE, ILS, Facilities Documentation/Analysis and Support Engineering ***Articles:*** ***FY 2018 Plans:*** -Continue systems integration activity at the Government Systems Integration Laboratory (GSIL) for various vehicle systems to include battle space awareness, command and control, and other communication requirements. ***FY 2019 Base Plans:*** -Continue JLTV systems integration activity at the GSIL to include engineering evaluation, specific to the vehicle, of evolving C4I requirements. This includes future capabilities as well as Mounted Family of Computers (MFOCs), Network on the Move (NOTM) Increment II, Communications Emitter Sensing and Attack Systems (CESAS) and other radio and communication platforms. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase between FY2018 and FY2019 of $.285M is due to the increased requirements for engineering analysis and integration of Command, Control, Communications, Computers and intelligence (C4I) hardware.	0.000 -	1.500 -	1.785 -	0.000 -	1.785 -
Title: Test and Evaluation Events and Analysis ***Articles:*** ***FY 2018 Plans:*** -Complete activity in accordance with the program TEMP to include FUSL, MOT&E, AFES, and C4I test. -Complete PCA, Manufacturing Readiness Assessment (MRA), and other RDT&E funded reviews. ***FY 2019 Base Plans:***	0.000 -	13.219 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** -The decrease between FY2018 and FY2019 of $13.219M is a result of the conclusion of planned test events in accordance with the approved program Test and Evaluation Master Plan (TEMP).					
Title: Program Management Support ***Articles:*** ***FY 2018 Plans:*** -Continue support for LRIP activity such as program management for test events, GFE management, monitoring and execution of the LRIP contract, and monitoring of vendor performance during LF testing. ***FY 2019 Base Plans:*** -Complete support for LRIP activity. -Initiate activity to support the evaluation of current and future integration and C4I requirements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.220M is the result of the transition of program management efforts to the procurement appropriation based on the stage of the program.	0.000 -	0.695 -	0.475 -	0.000 -	0.475 -
Accomplishments/Planned Programs Subtotals	0.000	20.710	2.260	0.000	2.260

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• PMC/5095: *Joint Light Tactical Vehicle (JLTV)*	104.230	233.639	607.011	-	607.011	707.778	475.381	439.744	421.609	710.182	3,765.577
• RDT&E/0605812M: *Joint Light Tactical Vehicle (JLTV) EMD*	7.657	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	127.347
• OPA/D15603: *JLTV (Army)*	587.514	804.440	1,319.436	-	1,319.436	1,147.246	1,242.725	1,346.783	1,211.192	14,970.677	23,044.538

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• RDT&E/VU9: *0605812A - JLTV (Army)*	11.086	23.467	2.686	-	2.686	2.732	1.744	2.789	4.799	74.341	584.096

Remarks

D. Acquisition Strategy

Joint Light Tactical Vehicle (JLTV) is a Joint Service Program with the U.S. Army and U.S. Marine Corps as the two main components. The U.S. Army is the JLTV service lead.

The JLTV Program entered the Production and Deployment Phase with the Acquisition Decision Memorandum authorization on 25 August 2015. With Milestone C approval, the LRIP fixed price contract was awarded to Oshkosh Defense LLC on 25 August 2015. This contract consists of a three year LRIP period with options for five additional years of FRP deliveries. JPO JLTV requested separately priced firm fixed price (FFP) option(s) for purchase of the Technical Data Package (TDP) with appropriate data rights to allow for possible future competition for production vehicles and spares.

During the LRIP phase, JPO JLTV will continue to produce production vehicles for extensive Test and Evaluation activities to support a FRP decision. A ramp up of JLTV quantities will continue to support fielding to U.S. Army and USMC units once the FRP decision is achieved and allow the program to transition into Full Rate production.

The JLTV program will continually monitor emerging technologies and capabilities through its partnerships with U.S. Army and USMC science and technology organizations as well as through industry market research and partnerships. At this time follow-on increments for technology insertion are undefined; the JLTV program will look for opportunities to implement increased capabilities throughout the system Life Cycle.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Live Fire Test Support	C/FFP	Oshkosh Defense : Oshkosh, WI	0.000	0.000		5.296	Jan 2018	0.000		-		0.000	0.760	6.056	-
		Subtotal	0.000	0.000		5.296		0.000		-		0.000	0.760	6.056	N/A

Remarks

FY17 and prior year details provided in PE 0605812M/Project 3209

-The decrease between FY2018 and FY2019 of $5.296M is the result of the conclusion of planned test events in accordance with the approved program Test and Evaluation Master Plan (TEMP).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Integration-GSIL	MIPR	SPAWAR Atlantic : Charleston, SC	0.000	0.000		1.500	Feb 2018	1.785	Feb 2019	-		1.785	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		1.500		1.785		-		1.785	Continuing	Continuing	N/A

Remarks

FY17 and prior year details provided in PE 0605812M/Project 3209

- The increase between FY2018 and FY2019 of $.285M is due to the increased requirements for engineering analysis and integration of Command, Control, Communications, Computers and intelligence (C4I) hardware.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test and Evaluation (Performance, RAM, Ballistic, Report Generation	MIPR	Government Proving Grounds-ATC : Aberdeen, MD	0.000	0.000		0.698	Jan 2018	0.000		-		0.000	0.000	0.698	-
Operational Test and Evaluation (Performance,	MIPR	Government Proving Grounds-Various : Various	0.000	0.000		10.074	Jan 2018	0.000		-		0.000	0.000	10.074	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	Project (Number/Name) 3209 / *Joint Light Tactical Vehicle*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
RAM, Ballistic, Report Generation															
Developmental Test and Evaluation Oversight	MIPR	MCOTEA : Quantico, VA	0.000	0.000		0.200	Jan 2018	0.000		-		0.000	0.000	0.200	-
Live Fire Test and Evaluation	MIPR	ATC : Aberdeen, MD	0.000	0.000		1.767	Jan 2018	0.000		-		0.000	0.000	1.767	-
Developmental Test and Evaluation	C/FFP	CORVID : Moorsville, NC	0.000	0.000		0.480	May 2018	0.000		-		0.000	0.000	0.480	-
		Subtotal	0.000	0.000		13.219		0.000		-		0.000	0.000	13.219	N/A

Remarks

FY17 and prior year details provided in PE 0605812M/Project 3209

-The decrease between FY2018 and FY2019 of $13.219M is the result of the conclusion of planned test events in accordance with the approved program Test and Evaluation Master Plan (TEMP).

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/FFP	Kalman, Inc : Stafford, VA	0.000	0.000		0.245	Dec 2017	0.227	Dec 2018	-		0.227	0.000	0.472	-
Program Management Support	C/CPFF	CECOM/MITRE : Aberdeen, MD	0.000	0.000		0.150	Sep 2018	0.148	Sep 2019	-		0.148	0.000	0.298	-
Travel	Various	MCSC : Quantico, VA	0.000	0.000		0.300	Oct 2017	0.100	Oct 2018	-		0.100	0.000	0.400	-
		Subtotal	0.000	0.000		0.695		0.475		-		0.475	0.000	1.170	N/A

Remarks

FY17 and prior year details provided in PE 0605812M/Project 3209

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	Project (Number/Name) 3209 / *Joint Light Tactical Vehicle*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		20.710		2.260		-		2.260	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

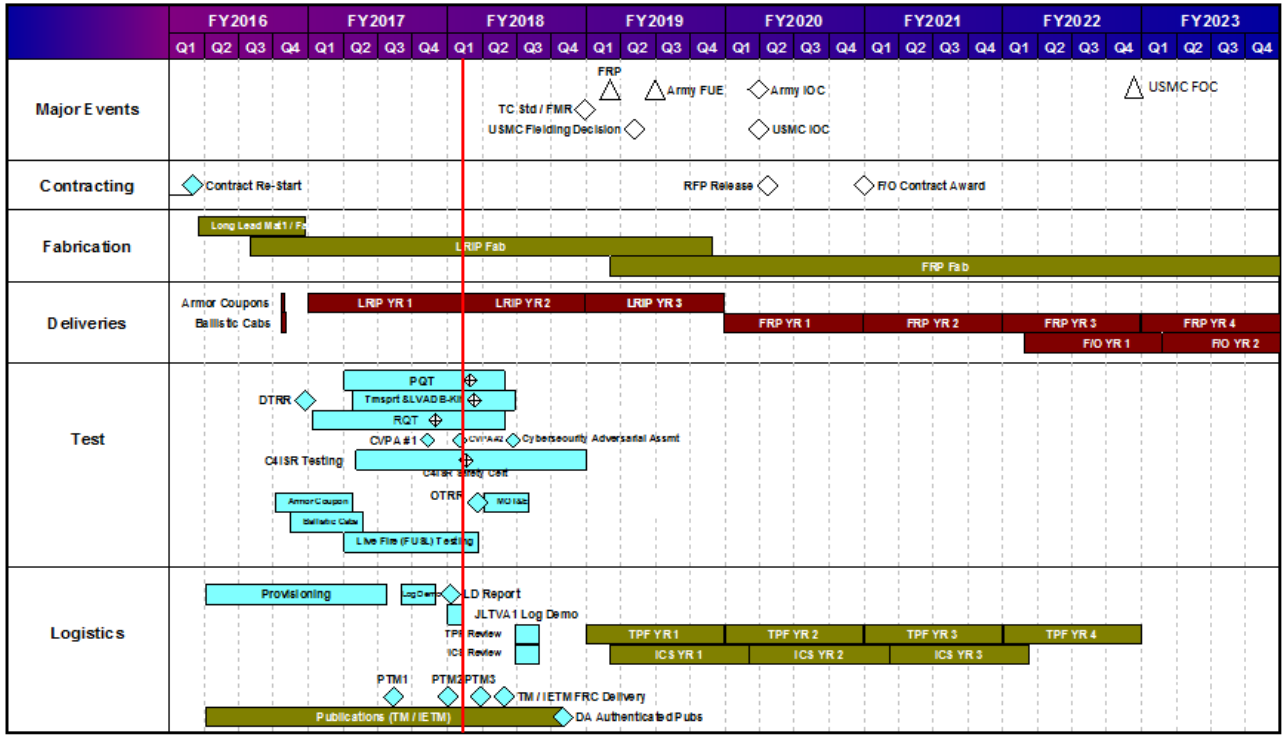


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0605813M / *(U)Joint Light Tactical Veh (JTLV) Sys Dev & Dem*	**Project (Number/Name)** 3209 / *Joint Light Tactical Vehicle*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3209				
Requirements/Production Qualification Test	1	2017	2	2018
Full Up Systems Level Test	1	2017	1	2018
Logistics Demonstration	3	2017	1	2018
Multi-Service Operational Test and Evaluation	2	2018	3	2018
Full Rate Production Decision	1	2019	1	2019
USMC Fielding Decision	2	2019	2	2019
USMC Initial Operational Capability	1	2020	1	2020
USMC Full Operational Capability	4	2022	4	2022
Full Operational Capability	4	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0204202N / *DDG-1000*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	1,384.275	45.187	140.500	161.264	-	161.264	132.337	133.781	88.573	16.617	Continuing	Continuing
2464: *DD(X) Sys Design, Dev & Integration*	1,384.275	45.187	140.500	161.264	-	161.264	132.337	133.781	88.573	16.617	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 197

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $2.000 million to account for the availability of prior year execution balances.

The FY 2019 funding request was reduced by $.486 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

This Program Element (PE) provides funds for development of the DDG 1000 Class of U.S. Navy surface combatants. The mission of the DDG 1000 class is to provide credible independent forward presence/deterrence and operate as an integral part of Naval, Joint or Combined Maritime Forces. DDG 1000 will provide advanced land attack capability in support of the ground campaign and contribute to Naval, Joint or Combined battlespace dominance in littoral operations. DDG 1000 will establish and maintain surface and sub-surface superiority, provide local air defense, and incorporate signature reduction to operate in all threat environments. DDG 1000 will have seamless Joint Interoperability to integrate all source information for battlespace awareness and weapons direction.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	45.642	140.500	120.412	-	120.412
Current President's Budget	45.187	140.500	161.264	-	161.264
Total Adjustments	-0.455	0.000	40.852	-	40.852
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.423	0.000			
• Program Adjustments	0.000	0.000	42.337	-	42.337
• Rate/Misc Adjustments	0.000	0.000	-1.485	-	-1.485
• Congressional General Reductions Adjustments	-0.032	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0204202N / *DDG-1000*

Change Summary Explanation

FY19 increase of 40.852M budget supports DDG 1000 class development and integration of surface strike capability.
The FY 2019 funding request was reduced by $2.0 million to account for the availability of prior year execution balances.

The FY 2019 funding request was reduced by $.486 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0204202N / *DDG-1000*	Project (Number/Name) 2464 / *DD(X) Sys Design, Dev & Integration*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2464: *DD(X) Sys Design, Dev & Integration*	1,384.275	45.187	140.500	161.264	-	161.264	132.337	133.781	88.573	16.617	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 197

A. Mission Description and Budget Item Justification

This project encompasses DDG 1000 development efforts required to deliver the Flight I DDG 1000 Class Ships. Major efforts include software requirements analysis, architectural and design code and unit testing, integration, qualification testing, and Independent Verification and Validation (IV&V) for Software Releases; execution of Integrated Power Systems (IPS) and ship control system testing and integration; Live Fire Test and Evaluation (LFT&E), Developmental Testing (DT), Integrated Testing (IT), and Operational Test (OT) in support of the Test and Evaluation Master Plan (TEMP) and development of Tactical Tomahawk Weapon Control System (TTWCS) software. Funding for previous years is included in PE 0604300N and under 0204202N Project Unit 4009, Advanced Gun System (AGS), on DD(X).

Surface Strike
After a comprehensive review of Zumwalt class requirements, Navy decided in November 2017 to refocus the primary mission of the Zumwalt Class Destroyers from Land Attack to Offensive Surface Strike. The funding requested in PB 19 will facilitate this change in mission and add lethal, offensive fires against targets afloat and ashore. These changes include integration of SM-6 capability, Maritime Strike Tomahawk Integration, and organic cryptologic collection equipment (SPECTRAL). In order to maintain the required radar signature, an upgrade in off-board platform communications to the Network Tactical Common Data Link (NTCDL) is also required, paired with the SPECTRAL system.

The Advanced Gun Systems will remain on the ships, but in an inactive status for future use, when a gun round that can affordably meet the desired capability is developed and fielded.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product / Software Development	12.935	72.180	73.854	0.000	73.854
Articles:	-	-	-	-	-
Description: Product Development/Software Development					
FY 2018 Plans: Continue development and corrections to Post Release 8 software, which will provide critical capabilities in command and control (GCCS-M), Helicopter integration (MH-60R) and Link 16 interoperability with other fleet assets. Continue with TTWCS Land Attack System Initiation Lab (LASIL) to add capability to test and certify					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0204202N / *DDG-1000*	**Project (Number/Name)** 2464 / *DD(X) Sys Design, Dev & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
the interface between TTWCS and the TSCE/DDG 1000 combat system. Continuation of Aircraft Handling and Securing System (AHSS) development and qualification. ***FY 2019 Base Plans:*** Enable the integration, lifecycle management and sustainment of the Total Ship Computing Environment (TSCE) Program of Record software as well as the capability to certify software at the Land Attack System Integration Lab (LASIL). Start development of the Surface Strike and Maritime Targeting Cell - Afloat (MTC-A). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** As the Software Development cost decreased, an addition of funding was required for Product Development to Surface Strike Implementation and Maritime Targeting Cell - Afloat (MTC-A) The FY 2019 funding request overall was reduced by $2.0 million to account for the availability of prior year execution balances.					
Title: Test and Evaluation ***Articles:*** ***Description:*** Test and Evaluation Master Plan (TEMP) Execution ***FY 2018 Plans:*** Tests for ship signature measurements (radar cross section and infrared signatures), structural test firings for both the Vertical Launching System and the Advanced Gun System, and Anti-air warfare live fire test events on the Self Defense Test Ship (SDTS). The relevant test events are DTB4-160B, DTB4-161, DTB4-120, ITB4-610, and ITB1-120. Planning for SDTS Anti-Air Warfare (AAW) completion, Probability of Raid Annihilation (PRA) Test Bed and Integrated Testing. Continue to provide travel. ***FY 2019 Base Plans:*** Execution of TEMP events for total ship survivability, equipment shock qualification, sonar and acoustics testing, torpedo evasion, calm and heavy weather trials, surface warfare and strike warfare. Start development of Maritime Targeting Cell - Afloat. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***	32.252 -	68.320 -	87.410 -	0.000 -	87.410 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0204202N / *DDG-1000*	**Project (Number/Name)** 2464 / *DD(X) Sys Design, Dev & Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase provides additional funds to cover the cost of Maritime Targeting Cell - Afloat The FY 2019 funding request overall was reduced by $2.0 million to account for the availability of prior year execution balances.					
Accomplishments/Planned Programs Subtotals	45.187	140.500	161.264	0.000	161.264

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OMN / 3B1K: *Specialized Skill Training*	706.694	856.077	879.557	51.138	930.695	994.956	1,031.101	1,050.322	1,069.026	0.000	6,638.871
• OPN / 0947: *DDG 1000 Class Support Equipment*	33.404	0.000	89.700	-	89.700	11.330	14.791	24.516	21.635	0.000	195.376
• OMN/15BUO: *Life Cycle Engineering (IWS))*	8.726	18.966	65.332	-	65.332	53.461	45.666	36.560	36.772	0.000	274.209
• OMN/15BR1: *DDG 1000 Life Cycle Engineering and Sustainment*	17.494	5.654	12.022	-	12.022	7.468	11.499	11.415	11.557	0.000	94.598
• RDTEN/0603795N_2020: *Advanced Gun System Projectile*	0.000	18.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	18.000

Remarks

D. Acquisition Strategy

In October 2010 a revised acquisition strategy had been determined that supports the DDG-1000/DDG-51 restart shipyard allocation workload Memorandum of Agreements (MOAs). Execution of the MOAs shifted primary construction of all three DDG-1000 class ships to Bath Iron Works (BIW). Award of the DDG 1001/1002 to BIW occurred in September 2011.

E. Performance Metrics

Successfully complete Operational Test Readiness Review. Successfully complete Developmental Test/Integrated Test/Live Fire/Operational Test. Successfully achieve Initial Operational Capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0204202N / *DDG-1000*	**Project (Number/Name)** 2464 / *DD(X) Sys Design, Dev & Integration*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ship Integration Development Software	SS/CPAF	Raytheon : Tewksbury MA	911.935	0.000		52.780	Dec 2017	30.387	Dec 2018	-		30.387	0.000	995.102	-
Ship Integration Development (Prod Dev), TTWCS /ASIST	SS/CPFF	Various : Various	65.346	12.935	Dec 2016	19.400	Dec 2017	13.467	Dec 2018	-		13.467	0.000	111.148	-
Surface Strike Implementation	TBD	TBD : TBD	0.000	0.000		0.000		8.300	Jan 2019	-		8.300	Continuing	Continuing	Continuing
Maritime Targeting Cell - Afloat	TBD	TBD : TBD	0.000	0.000		0.000		21.700	Jan 2019	-		21.700	Continuing	Continuing	Continuing
		Subtotal	977.281	12.935		72.180		73.854		-		73.854	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SDTS (ITB1-120) / PRA TB	SS/CPFF	Raytheon : Portsmouth, RI	113.322	7.477	Dec 2016	6.500	Dec 2017	11.300	Dec 2018	-		11.300	4.800	143.399	-
T&E Engineering	C/CPIF	CSC : Washington, DC	3.000	0.200	Jan 2017	0.200	Dec 2017	0.200	Dec 2018	-		0.200	0.200	3.800	-
SDTS/PRA/Integrated Test	Various	Various : Various	34.319	8.745	Nov 2016	6.078	Nov 2017	2.116	Nov 2018	-		2.116	5.411	56.669	-
Advanced Program	C/CPIF	NSMA : Arlington, VA	6.679	5.500	Nov 2016	4.400	Nov 2017	2.400	Nov 2018	-		2.400	2.400	21.379	-
Maritime Targeting Cell - Afloat	TBD	TBD : TBD	0.000	0.000		0.000		9.300	Jan 2019	-		9.300	0.000	9.300	-
Eng/M&S/Cert Agents	WR	NSWC : Dahlgren, VA	7.927	0.200	Nov 2016	0.200	Nov 2017	0.244	Nov 2018	-		0.244	0.200	8.771	-
Integrated Test	WR	NSWC : Bethesda, MD	14.237	1.096	Nov 2016	1.614	Nov 2017	2.450	Nov 2018	-		2.450	1.825	21.222	-
HM&E Systems	WR	NSWC : Philadelphia, PA	0.100	0.500	Nov 2016	0.250	Nov 2017	0.000		-		0.000	0.125	0.975	-
SDTS/PRA/Test Bed/ ESSM Engagement	Various	Various : Various	11.264	0.000		0.000		0.000		-		0.000	0.000	11.264	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0204202N / *DDG-1000*	Project (Number/Name) 2464 / *DD(X) Sys Design, Dev & Integration*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Threat Assesment/IR	C/CPIF	NRL : Washington, DC	0.000	0.000		1.400	Dec 2017	1.320	Dec 2018	-		1.320	1.800	4.520	-
SDTS	WR	SCSC : Wallops, Is, VA	5.903	0.000		0.000		0.000		-		0.000	0.000	5.903	-
LFT&E	C/CPIF	ROI : Mullica Hills, NJ	7.950	0.000		0.000		0.000		-		0.000	0.000	7.950	-
ITB3/ITB4/OPEVAL	Various	Various : Various	0.000	0.000		16.092	Nov 2017	12.983	Nov 2018	-		12.983	14.800	43.875	-
Integration and Testing	Various	Various : Various	8.230	3.700	Nov 2016	0.023	Dec 2017	0.599	Dec 2018	-		0.599	0.024	12.576	-
T&E Engineering	WR	COTF : Norfolk, VA.	8.831	1.100	Dec 2016	2.516	Dec 2017	2.110	Dec 2018	-		2.110	2.634	17.191	-
Int Test/Undersea Warfare	WR	Various : Various	0.747	0.000		0.000		0.000		-		0.000	0.000	0.747	-
TTWCS	C/CPIF	NAVAIR : Not Specified	0.000	0.000		2.100	Mar 2018	1.805	Mar 2019	-		1.805	3.600	7.505	-
Sonobouys	TBD	NAVAIR : Not Specified	0.000	0.000		0.000		0.300	Dec 2018	-		0.300	0.650	0.950	-
LRLAP Test Article Procurement ITB3/ITB4 (EMD)	C/CPIF	BAE : Minneapolis, MN	54.064	0.000		0.000		0.000		-		0.000	0.000	54.064	-
LFT&E Engineering	C/CPIF	ROI : Mullica Hills, NJ	33.652	0.000		1.600	Dec 2017	0.600	Dec 2018	-		0.600	0.600	36.452	-
ESSM/SM2 Procurement	C/CPIF	Raytheon : Tucson, AZ	39.538	0.000		0.000		0.000		-		0.000	0.000	39.538	-
MOE Test Bed	WR	NUWC : Various	1.760	0.000		1.469	Nov 2017	8.515	Nov 2018	-		8.515	1.657	13.401	-
Component Shock Qualification	WR	Various : Various	0.000	0.000		7.000	Nov 2017	21.000	Nov 2018	-		21.000	21.000	49.000	-
SDTS and Integrated Test	Various	PEO IWS : Washington, DC	47.986	3.234	Nov 2016	14.978	Nov 2017	8.668	Nov 2018	-		8.668	9.298	84.164	-
T&E Engineering	WR	NSWC : Panama City, FL	3.530	0.000		0.900	Nov 2017	0.500	Nov 2018	-		0.500	9.200	14.130	-
FSST	Various	Various : Various	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Travel	Various	NAVSEA : Washington, DC	3.955	0.500	Apr 2017	1.000	Oct 2017	1.000	Dec 2018	-		1.000	1.000	7.455	-
		Subtotal	406.994	32.252		68.320		87.410		-		87.410	81.224	676.200	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0204202N / *DDG-1000*	Project (Number/Name) 2464 / *DD(X) Sys Design, Dev & Integration*	

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,384.275	45.187		140.500		161.264		-		161.264	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0204202N / *DDG-1000*	**Project (Number/Name)** 2464 / *DD(X) Sys Design, Dev & Integration*

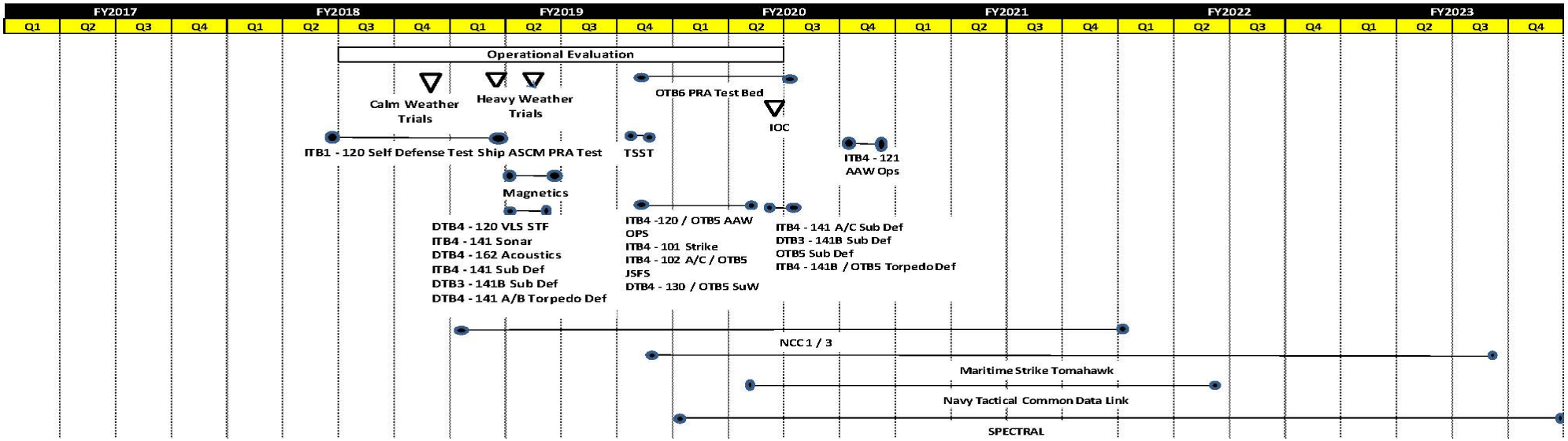


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0204202N / *DDG-1000*	**Project (Number/Name)** 2464 / *DD(X) Sys Design, Dev & Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2464				
Conduct ITB1 - SDTS	2	2018	1	2019
OPEVAL	3	2018	2	2020
IOC	2	2020	2	2020
OTB6 PRA Test Bed	3	2019	1	2020
Calm Weather Trials	4	2018	4	2018
Heavy Weather Trials	1	2019	1	2019
TSST	4	2019	4	2019
Magnetics	1	2019	2	2019
ITB4-121 AAW Ops	4	2020	4	2020
DTB4-120 VLS STF; DTB3-610 AGS STF	2	2019	2	2019
ITB4-120 / OTB5 AAW Ops; ITB4-101 Strike; ITB4-102A/C / OTB5 JSFS; DTB4-130 / OTB5 SuW	4	2019	2	2020
ITB4-141 Sonar; DTB4-162 Acoustics; ITB4-141 Sub Def	2	2019	2	2019
DTB3-141B Sub Def; DTB4-141 A/B Torpedo Def	2	2019	2	2019
ITB4-141 A/C Sub Def; DTB3-141B Sub Def; OTB5 Sub Def; ITB4-141B / OTB5 Torpedo Def	2	2020	3	2020
NCC 1/3	1	2019	4	2021
Maritime Stirke Tomahawk	4	2019	3	2023
Navy Tactical Common Data Link	2	2020	2	2022
SPECTRAL	1	2020	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0304231N *I Tactical Command System - MIP*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	7.511	0.676	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.187
2009: *OSIS Evolutionary Development (OED)*	7.511	0.676	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.187

A. Mission Description and Budget Item Justification

Radiant Mercury (RM) is a secure information platform that provides an automated means to sanitize, downgrade, guard, and transliterate formatted data at various classifications, compartments and releasabilities. It enables Combatant Commanders as well as operational commanders, afloat and ashore to disseminate and receive critical operational and intelligence information with coalition and allied forces.

FY19: Trusted Information System (TIS) Radiant Mercury (RM) cross domain solution (CDS) requirement will no longer be centrally funded via PE 0304231N. This does not remove the cross domain solution (CDS) requirement, instead it transfers costs associated with RM and compliance with the CDS process to Programs of Record.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.676	0.000	0.000	-	0.000
Current President's Budget	0.676	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Change Summary Explanation

Technical/Funding/Schedule:

- Trusted Information System (TIS) Radiant Mercury (RM) Cross Domain Solution (CDS) funding responsibility was transferred to the requiring programs of record.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0304231N / *Tactical Command System - MIP*	Project (Number/Name) 2009 / *OSIS Evolutionary Development (OED)*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2009: *OSIS Evolutionary Development (OED)*	7.511	0.676	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.187
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Trusted Information System (TIS) Radiant Mercury (RM) is a system that successfully provides accredited Cross Domain Solutions (CDS) to the Navy, the Department of Defense (DoD), and the Intelligence Community (IC). TIS RM is a critical component of network-centric warfare, supporting joint operations, allied, and coalition forces world-wide. The ability to pass sensitive and critical data across security domains and to our allied and coalition partners in a timely fashion can only be met by accredited CDS systems such as RM. RM enables the Navy to operate in a multi-national environment.

TIS RM provides automated, bi-directional sanitization, transliteration and guarding capability for formatted and unformatted data between security enclaves. RM helps ensure critical intelligence is provided quickly to operational decision-makers. TIS RM provides the capability to disseminate information for operating forces worldwide, including the operating forces of key allies in the Pacific, Central and European Command regions. This capability to move all-source intelligence-derived track information into the realm of the operational community significantly improves the situational awareness of tactical operators and planners. Unformatted data is handled by the Information Review Process (IRP). The system provides cross domain services to a wide variety of customers including Combatant Commanders, Air Force (Shared Early Warning program), Army (Blue Force Tracking Program), Missile Defense Agency (MDA), Navy Cyber Defense Operations Command (NCDOC), Naval Modular Automated Communication Systems (NAVMACS), Mobile User Objective Systems (MUOS), Navy (Global Command and Control System - Maritime/J (GCCS-M/J), Automatic Identification System (AIS), Maritime Operations Centers (MOC), Distributed Common Ground System-Navy (DCGS-N), Tactical Ranges (TR), and numerous other DoD and Intelligence agencies.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Radiant Mercury (RM)	0.676	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304231N / *Tactical Command System - MIP*	**Project (Number/Name)** 2009 / *OSIS Evolutionary Development (OED)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
No changes.					
Accomplishments/Planned Programs Subtotals	0.676	0.000	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Trusted Information Systems (TIS) Radiant Mercury (RM) provides automated, bi-directional sanitization, transliteration and guarding capability for formatted and unformatted data between security enclaves. RM helps ensure critical Indications and Warning intelligence is provided quickly to operational decision-makers. RM provides certified and accredited Cross Domain capabilities in the Pacific Command (PACOM), Europe Command (EUCOM) and Central Command (CENTCOM), Northern Command (NORTHCOM), Areas of Responsibility (AOR). As of FY18 RM is a 100% fee-for-service program. It generates funds through Life Cycle Surcharge (LCS) on all new task orders and Annual User Fees (AUF) on all operational RM systems currently fielded. These funds support development and infrastructure cost as well as program operating cost.

E. Performance Metrics

Radiant Mercury (RM) provides and develops certified, accredited Cross Domain Solutions (CDS) and transfer capabilities to the Department of Defense (DoD) and Intelligence Community (IC), and provides the capability to disseminate and receive operational and intelligence information for 100% of authorized sites.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0304231N / *Tactical Command System - MIP*	Project (Number/Name) 2009 / *OSIS Evolutionary Development (OED)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/CPFF	Lockheed Martin : Denver, CO	5.280	0.415	Dec 2016	0.000		0.000		-		0.000	0.000	5.695	-
Software Development	C/CPFF	Various : Various	0.414	0.081	Dec 2016	0.000		0.000		-		0.000	0.000	0.495	-
		Subtotal	5.694	0.496		0.000		0.000		-		0.000	0.000	6.190	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Requirements Analysis	C/CPFF	Various : Various	0.191	0.000		0.000		0.000		-		0.000	0.000	0.191	-
Requirements Analysis	C/CPFF	BAH : San Diego, CA	1.170	0.000		0.000		0.000		-		0.000	0.000	1.170	-
		Subtotal	1.361	0.000		0.000		0.000		-		0.000	0.000	1.361	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Certification Test	WR	SSC LANT : Charleston, SC	0.243	0.000		0.000		0.000		-		0.000	0.000	0.243	-
Certification Test	C/CPFF	Lockheed Martin : Denver, CO	0.213	0.180	Dec 2016	0.000		0.000		-		0.000	0.000	0.393	-
		Subtotal	0.456	0.180		0.000		0.000		-		0.000	0.000	0.636	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.511	0.676		0.000		0.000		-		0.000	0.000	8.187	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304231N / *Tactical Command System - MIP*	**Project (Number/Name)** 2009 / *OSIS Evolutionary Development (OED)*

Proj 2009	2017				2018				2019				2020				2021				2022				2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Test & Evaluation																												
Certification Test		CT&E - RM Version 6.x																										
RM Software Deliveries																												

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304231N / *Tactical Command System - MIP*	**Project (Number/Name)** 2009 / *OSIS Evolutionary Development (OED)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2009				
Test & Evaluation: Test & Evaluation Milestone - CT&E: RM Test & Evaluation Milestone - CT&E - RM Version 6.x	1	2017	2	2017

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	293.779	34.038	28.311	44.098	-	44.098	47.173	51.929	49.685	58.652	Continuing	Continuing
2134: *Shipboard IW Exploit*	293.779	34.038	28.311	44.098	-	44.098	47.173	51.929	49.685	58.652	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Shipboard Information Warfare (SIW) line includes the Ship's Signal Exploitation Equipment (SSEE) Family of Systems (FoS) which include Increment E, Increment F (and its variants), Spectral and Modifications, as well as the Integrated Communications Data System (ICADS) Increment I and Increment II. These programs are classified Information Warfare (IW) / Electronic Warfare (EW) tactical cryptologic systems supporting Command and Control, Battlespace Awareness, Electromagnetic Maneuver Warfare / Integrated Fires (EMW/IF) modes of global engagement. These systems enable power projection in any environment including communications challenged (referred to as Anti-Access, Area Denial (A2AD)) situations across the globe and provide offensive EW capabilities ensuring surface vessels ability to disrupt, deny, degrade and defeat adversary (state and non-state) use of the radio frequency spectrum while simultaneously providing advanced Information Related Capabilities (IRC) to maritime warfighters. SSEE systems detect adversary radio frequency emissions and use them to provide critical tactical and strategic intelligence, situational awareness, and hostile threat assessment depriving the adversary of enhanced signals exploitation capability and limiting their ability to counter strike.
The systems are incremental acquisition programs designed to pace adversary communications technology development by using Research, Development, Test & Evaluation (RDT&E) funding to rapidly develop and transition new technologies and provide new capabilities as Pre-Planned Product Improvement (P3I) upgrades into the system's hardware/software configuration via a net-centric Service Oriented Architecture (SOA). Funding will focus on developing and delivering expanded offensive IW / EW and future Cyberspace capabilities in accordance with Presidential direction and in support of multiple Operational Plans (OPLANS) and communications challenged scenarios. ICADS Increment II is a mission critical system providing advanced simulation capability for naval platforms as well as back-up communications capabilities. Additional details for these programs are held at a higher classification level.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	36.747	28.311	37.850	-	37.850
Current President's Budget	34.038	28.311	44.098	-	44.098
Total Adjustments	-2.709	0.000	6.248	-	6.248
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.009	0.000			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	5.637	-	5.637
• Rate/Misc Adjustments	0.000	0.000	0.611	-	0.611

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*		R-1 Program Element (Number/Name) PE 0304785N / *Tactical Cryptologic Systems*			
• Congressional Directed Reductions	-2.700	-	-	-	-
Adjustments					

Change Summary Explanation

The FY 2019 funding request was reduced by $5.50 million to account for the availability of prior year execution balances.
The increase in funding from FY18 to FY19 is provided to develop capabilities to enable advanced National / Tactical Integration with the United States (U.S.) Navy Surface Cryptologic Systems as well as develop, test and integrate advanced, targeted maritime Information Warfare (IW)capabilities and techniques in support of the Deputy Secretary of Defense Management Action Group (DMAG) Asia-Pacific Security Initiatives (APSI) into the SSEE Family of Systems (FoS). Deploying NSAnet aboard afloat large-deck platforms, while simultaneously adhering to national cybersecurity initiatives, it brings advanced inter-strike group network capabilities to operate in any environment. This brings special Signals Intelligence (SIGINT) processing capabilities, enterprise services, and a mission data repository allowing automated synchronization with national databases. It also supports development and engineering to integrate Cryptologic systems with shipboard combat systems for tightly coupled Electromagnetic Maneuver Warfare / Integrated Fires (EMW/IF) bringing high-side fusion and battle management aids within the Ship's Signal Exploitation Equipment (SSEE) Family of Systems (FoS). As a result of ongoing Pre-Acquisition activities in conjunction with requirements definition and adaptation of hybrid acquisition models to facilitate and adapt to rapid changes in adversary capabilities across the lifetime of the system, the following change has been made to the schedule: Integrated Communications Data System (ICADS) Increment II Milestone C shifted from Q2FY19 to Q1FY20. $4.6M was realigned from FY19 OPN to RDTE to account for shift in Milestone C.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0304785N / *Tactical Cryptologic Systems*				Project (Number/Name) 2134 / *Shipboard IW Exploit*			
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
2134: *Shipboard IW Exploit*	293.779	34.038	28.311	44.098	-	44.098	47.173	51.929	49.685	58.652	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $5.50 million to account for the availability of prior year execution balances. The Shipboard Information Warfare (SIW) line includes the Ship's Signal Exploitation Equipment (SSEE) Family of Systems (FoS) (which include SSEE Increment E, SSEE Increment F (and its variants), Spectral and SSEE Modifications), and Integrated Communications Data System (ICADS) (which includes ICADS Increment I and ICADS Increment II). These programs are classified Information Warfare (IW) / Electronic Warfare (EW) tactical cryptologic systems supporting all facets of Assured Command and Control, Battlespace Awareness, Electromagnetic Maneuver Warfare / Integrated Fires (EMW/IF) modes of global engagement. These systems, including their variants, provide battle group and combatant commanders with real-time indications and warnings by acquisition ("Find") and localization ("Fix") of Signals of Interest (SOI) as well as the Surface Fleet's only EW non-kinetic capabilities ("Finish"). The SSEE Increment F variants bring a new dimension of afloat Signals Intelligence (SIGINT) capabilities while providing advanced scalability and modularity for mission planners to execute. As an incremental acquisition program, Research, Development, Test & Evaluation (RDT&E) funding is required to rapidly develop and integrate new technologies and associated new operational capabilities to pace both known and future signal threats and transition as Pre-Planned Product Improvement (P3I) upgrades into the system's hardware / software configuration and deliver to fielded systems via annual build releases. This program's funding incorporates P3I, new Commercial-Off-the-Shelf (COTS) or Government-Off-the-Shelf (GOTS) based technologies and software into the existing systems to address Fleet needed priorities, capability gaps or combat known threats. Funding also focuses on developing and delivering expanded non-kinetic EW capabilities and net-centric Service Oriented Architecture (SOA), as well as meeting intended interoperability objectives through Fleet defined Common Core Architectures (CCA) to enable application hosting services; all in accordance with Presidential direction and strategic objectives while also in support of multiple Operational Plans (OPLANS), Concepts of Operations (CONOPS) and communications challenged (referred to as Anti-Access, Area Denial (A2AD)) scenarios (further details held at a higher classification level). SIW will continue development and integration of communications challenged solutions for the SSEE Increment F and Modifications systems as well as bring enhanced signals exploitation and expanded SOI processing capabilities to fielded systems. Funding supports development and integration efforts to fuse data produced and distributed by Shipboard IW/Information Operations (IO) systems with other intelligence data at multiple classification levels and provided to shipboard combat systems to support kinetic and non-kinetic fires. It can also be used to enable a more complete understanding and more agile and effective exploitation of the electromagnetic spectrum.

FY19 funding for SSEE Increment F (and its variants) will continue to develop, refine, and test new, unexplored and unexploited cyber capabilities. It will begin integration of solutions to incorporate other Navy development investments to enhance the Fleet's ability to dominate and defend cyberspace mediums, insert new technology enhancements via incremental software & hardware upgrades and deliver as annual build release. Specifically, Increment F will continue development and integrate designs in support of software and hardware development for VITA 49 / VPX Next-Generation Chassis modifications to provide enhanced data processing, and greater exposure of existing system services while meeting constricting Space, Weight, Power and Cooling (SWPaC) requirements on ships. It will deliver advanced capabilities in a dynamic environment while integrating hosting services to platforms, bringing an enhanced modular, mission-tailorable system infrastructure specifically required for National/Tactical integration. Funding will also continue development for solutions intended to meet Joint interface and compliance standards (4.X) while creating netted sensor framework strategies and delivering enhanced automation capabilities to expedite sensor tasking and control and ease operator

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

workflows. SSEE Increment F also continues to integrate (A2AD) capabilities into system configuration while developing capabilities to enable advanced National/ Tactical Integration with U.S. Navy Surface Cryptologic Systems by deploying NSAnet afloat aboard large-deck platforms to adhere to national cybersecurity initiatives by bringing advanced inter-strike group network capabilities able to operate in any environment as well as develop, test and integrate advanced, targeted maritime Information Warfare (IW) capabilities and techniques in support of the Deputy Secretary of Defense Management Action Group (DMAG) Asia-Pacific Security Initiatives (APSI). It will begin to integrate Cryptologic systems with shipboard combat systems for tightly coupled Electromagnetic Maneuver Warfare / Integrated Fires (EMW/IF) bringing high-side fusion and battle management aids within the Ship's Signal Exploitation Equipment (SSEE) Family of Systems.

FY19 funding for Spectral will continue acquisition activities, development and engineering of Engineering Design Models (EDMs), logistics, test planning and contracting activities required for Fleet Capability Release - 1 (FCR-1) and in alignment with Build Decision - 1 (BD-1).

FY19 funding for SSEE Modifications supports executing hardware and software development to bring advanced capabilities to the Fleet for simultaneous detection, collection, processing, electronic warfare and display of communication intelligence data from hostile, high threat and adversary platforms in select extended frequency ranges not prosecuted today. It will continue development to integrate designs to bring advanced signal processing to the Next Generation-GRAYWING capability while migrating to meet future industry backplane standards to align with Common Core Architecture (CCA) strategies.

FY19 funding for Integrated Communications and Data Systems Increment II (ICADS Inc. II) will support EDM - 2 development as well as make any necessary engineering changes to EDM - 1 in preparation for the second Integration and Development Test (Operational Assessment) and to support the Low-Rate Initial Production (LRIP) decision. ICADS Inc. II is a mission critical system providing advanced capabilities and back-up communications for naval platforms with additional details held at higher classification to support Commander, U.S. Pacific Fleet (COMPACFLT) requirements outlined in the Capability Production Document.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Ship's Signal Exploitation Equipment Inc F (SSEE Inc F)	16.116	6.487	9.848	0.000	9.848
Articles:	-	-	-	-	-
FY 2018 Plans: Continue Pre-Planned Product Improvement (P3I) to provide enhanced capabilities into the SSEE Increment F system and its variants. Commencing solutions to meet Joint interface development and compliance standards (4.X) while creating netted sensor framework strategies and delivering enhanced automation capabilities to expedite sensor tasking and control and ease operator workflows. Develop and deliver Electronic Warfare (EW) capabilities based upon the warfighter identified FY18 Signals of Interest (SOI) threats (annually-updated) for integration into the SSEE Increment F system and deliver into annual build release. Expand SOI Directional Finding (DF), processing, and exploitation capabilities to allow collection of the newest high priority modern technology threat signals across multiple frequency bands for tightly integrated IO / non-kinetic capabilities while opening the SSEE system architecture for enhanced collaborative development and future capability integration. Continuing development of Anti-Access, Area Denial (A2AD) capabilities. Continue on the Next-					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Generation chassis development and begin integration into the host system. Enhance SSEE Increment F remoting capabilities and usability by providing increased functionality and capabilities along with delivering streamlined user interfaces to remote and local users. Maintain cognizance of current warfighter-identified signal sets and make additions and improvements to the system as required by National and Fleet stakeholders. ***FY 2019 Base Plans:*** Continue to develop Joint interface compliance standards (4.X) while creating netted sensor framework strategies and delivering enhanced automation capabilities to expedite sensor tasking and control and ease operator workflows. Continue Pre-Planned Product Improvements (P3I) to develop and deliver Electronic Warfare (EW) capabilities based upon the warfighter identified FY19 Signals of Interest (SOI) threats (annually-updated) for integration into the Ship's Signal Exploitation Equipment (SSEE) Increment F system and deliver into annual build release. Develop, refine, and test new, unexplored and unexploited cyber capabilities as well as begin integration solutions to incorporate other Navy development investments to enhance the Fleet's ability to dominate and defend cyberspace mediums and insert new technology enhancements via incremental software and hardware upgrades. Continue software and hardware development for Next-Generation Chassis designs and integrate communications challenged Anti-Access, Area Denial (A2AD) capabilities into this new open architecture framework creating a modular, mission-tailorable capability specifically required for National / Tactical mission integration. Design system interfaces and data flow techniques to enable advanced National / Tactical Integration with U.S. Navy Surface Cryptologic Systems by deploying NSAnet afloat aboard large-deck platforms while adhering to national cybersecurity initiatives by bringing advanced inter-strike group network capabilities able to operate in any environment as well as develop, test and integrate advanced, targeted maritime Information Warfare (IW) capabilities and techniques in support of the Deputy Secretary of Defense Management Action Group (DMAG) Asia-Pacific Security Initiatives (APSI). Begin integration and interoperability of SSEE to the Distributed Data Transfer Service, Cross Domain Systems and Common Tactical Manager as part of the Electromagnetic Maneuver Warfare / Integrated Fires (EMW/IF) concept while developing data fusion capabilities and battle management aids to be hosted on SSEE to publish and subscribe data exchange between SSEE residing on SCI Networks and systems residing on the GENSER Combat Systems network. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY18 to FY19 increases the U.S. Navy's maritime position to support National Security Strategies specifically the DMAG APSI, while also securing network operations by delivering NSAnet afloat to large-deck					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
platforms, and initiating Fleet Combat Systems integration through EMW/IF development efforts. Additional details are held at a higher classification.					
Title: Spectral	6.818	9.326	18.731	0.000	18.731
Articles:	-	-	2	-	2
FY 2018 Plans: Achieve programmatic Milestone B decision to progress into the Engineering & Manufacturing Stage. Continue acquisition activities, systems engineering, logistics, test planning (including finalizing the Test & Evaluation Master Plan (TEMP)) and contracting activities in support of the Milestone B decision as well as continue development efforts to create Engineering Design Models (EDMs) and refine requirements, technical data packages and matrices for Requirements Development Plan (RDP) approval and Build Decision - 1 (BD-1). Refine Anti-Access, Area Denial (A2AD) capabilities to be incorporated into future Fleet Capability Release (FCR) baseline releases. Continue afloat combat systems integration and execute studies, analysis and engineering efforts for market research to support Advanced Radio Frequency (RF) aperture development and integration to satisfy Fleet needs for multi-mission antennas and control modules as part of the Spectral requirement while also expanding upon the Information Warfare (IW) / Electronic Warfare (EW) and tactical Cryptologic system capability of exploiting signals throughout the RF spectrum, in addition to focusing new technologies towards new and previously unexplored/unexploited cyber capabilities as we integrate into the Integrated Fires (IF) architecture and develop enhanced interfacing to interoperate with Ship's Combat and Intelligence systems.					
FY 2019 Base Plans: Supports Engineering Design Models EDM development and commence systems engineering, logistics, and training development activities and documentation in support of Limited Deployment Decision. Complete Fleet requirements and engineering reviews supporting Build Decision - 1 (BD - 1) and Build Technical Review - 1 (BTR-1) to solidify requirements and engineering plans associated with Fleet Capability Release -1 (FCR - 1). FCR - 1 establishes the initial software and hardware baseline configurations and common core capabilities associated with the next generation system including enhanced requirements to integrate the systems with Ship's Combat and Intelligence to support Integrated Fires while also integrating A2AD capabilities. Initiate system design to include an expanded mission module hosting environment, advanced Information Warfare (IW) / Electronic Warfare (EW) cyberspace capabilities capable of exploiting signals throughout the RF spectrum. Continue acquisition activities and execute engineering and support activities to develop two EDM systems while completing multiple engineering design reviews and iterative software development cycles					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
inherent to Fleet Capability Review - 1 (FCR - 1). Initiate test plans to support FCR - 1 Integration Test and Operations Assessments. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY18 to FY19 increase is to support Engineering Design Models (EDM) development for both shore and afloat based systems in alignment with established U.S. Navy cryptologic requirements definition through the established FCR-1 initial software and hardware baseline. Efforts include engineering and design of hardware components, software configuration management, user interfaces, and coordination and planning.					
Title: Integrated Communications and Data Systems Increment II (ICADS Inc II)	5.000	8.000	9.837	0.000	9.837
Articles:	-	1	1	-	1
FY 2018 Plans: Continue acquisition and systems engineering activities including documentation to support milestone decision and contract release. Complete Increment II design reviews including System Requirement Review (SRR), Preliminary Design Review (PDR) and Critical Design Review (CDR) and deliver EDM - 1 for testing cycles and initiate Integrated Testing (IT) B1 as part of the Engineering and Manufacturing Phase. ***FY 2019 Base Plans:*** Finalize delivery of Engineering Design Models EDM - 2 and make necessary engineering changes to EDM - 1 in preparation for the second Integration and Development Test (IT-B2 / Operational Assessment). Complete all necessary acquisition, systems engineering, logistics, training development activities and documentation in support of the Low-Rate Initial Production (LRIP) / Milestone C decision. Finalize all technical drawings and contractual documentation in preparation for Request for Proposal (RFP) contract release to support production of the ICADS LRIP and Full-Rate Production systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY18 to FY19 increase procures hardware and software components including enhanced antennas, positioners, and amplification equipment associated with the development of Engineering Design Models EDM - 2 and					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
corrects Software Problem Report (SPR) deficiencies identified in Integration Test (IT-B1) in preparation for the second Integration and Development Test (IT - B2 / Operational Assessment).					
Title: Ship's Signal Exploitation Equipment Modifications (SSEE Modifications)	6.104	4.498	5.682	0.000	5.682
Articles:	-	-	-	-	-
FY 2018 Plans: Achieve both Full Rate Production (FRP) milestone and Initial Operating Capability (IOC) as defined in the program acquisition strategies. SSEE Modifications will transition to annual Build releases post FRP. Execute hardware and software development to bring advanced capability to the Fleet for simultaneous detection, collection, processing, electronic warfare and display of communication intelligence data from hostile, high threat and adversary platforms in select extended frequency ranges not prosecuted today, as well as further engineering development to bring advanced signal processing to the Next Generation-GRAYWING capability while migrating to meet future industry backplane interconnectivity standards to align with Common Core Architecture (CCA) strategies. Continue development and integration of communications challenged Anti-Access, Area Denial (A2AD) solutions as well as bring enhanced Signals exploitation and expanded Signals of Interest (SOI) processing capabilities to fielded systems.					
FY 2019 Base Plans: Continue to execute hardware and software development via annual software release to bring further advanced capability to the Fleet within the expanded Radio Frequency (RF) ranges such as delivering advanced Directional Finding (DF) algorithms to increase geolocation accuracy and integrating new exploitation techniques to address emerging signal threats, while delivering advanced capability to the Fleet through simultaneous detection, collection, processing, electronic warfare, and geographical display of communication intelligence data from hostile, high threat and adversary platforms. Continue designs to bring advanced signal processing to the Next Generation-GRAYWING capability. Begin engineering development and system designs to meet future industry backplane interconnectivity standards to align with CCA strategies. Continue development and integration of communications challenged A2AD solutions as well as deliver enhanced Signals exploitation and expanded SOI processing capabilities and signal acquisition algorithms to fielded systems. Complete Joint Interoperability Test Center (JITC) certification testing.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase from FY18 to FY 19 intends to satisfy unique U.S. Navy needs outlined in their annual FY19 Integrated Priority Lists (IPL) and supports theater operations plans through engineering and development of specific Information Warfare (IW) capabilities able to provide Carrier Strike Group continued operations in communications challenged environments (A2AD). Increase also develops and delivers software builds to bring enhanced capabilities to the Fleet for simultaneous detection, collection, processing, electronic warfare and display of communication intelligence data from hostile, high threat and adversary platforms. Details held at higher classification.					
Accomplishments/Planned Programs Subtotals	34.038	28.311	44.098	0.000	44.098

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN / 2360: *Shipboard IW Exploit*	169.021	187.007	220.883	-	220.883	225.348	263.170	288.949	299.719	Continuing	Continuing

Remarks

D. Acquisition Strategy

Acquisition, management and contracting strategies support engineering, manufacturing development and production by providing funds to a Prime Contractor and Space & Naval Warfare Systems Command (SPAWAR) Systems Center (SSC) - Atlantic, SPAWAR Systems Center - Pacific and miscellaneous contractors, with management and contract oversight by SPAWAR HQ.

E. Performance Metrics

Ship's Signal Exploitation Equipment (SSEE) Increment F will incorporate pre-planned product improvements to provide enhanced or additional capabilities into the system to increase performance and capability while maximizing value to the Navy. SSEE Increment F improvements along with the addition of the SSEE Modifications and Medusa capabilities will expand signals of interest processing capability to allow collection of the newest high priority modern technology threat signals for tightly integrated IO / non-kinetic capabilities in support of time critical military strike operations and subsequent processing and analysis for timely and accurate situational awareness for force protection. Paragon is a classified Navy tactical signals intelligence frequency extension capability that will be integrated into Ship's Signal Exploitation Equipment Increment E and F programs. Spectral will expand upon the Information Warfare (IW) / Electronic Warfare (EW) and tactical cryptologic system capability of exploiting signals throughout the Radio Frequency (RF) spectrum, in addition to focusing new technologies towards new and previously unexplored and unexploited cyber capabilities as we integrate into the Electromagnetic Maneuver Warfare (EMW) Integrated Fires (IF) architecture.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0304785N / *Tactical Cryptologic Systems*	Project (Number/Name) 2134 / *Shipboard IW Exploit*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development Prior Years	Various	Various : Various	158.330	0.000		0.000		0.000		-		0.000	0.000	158.330	-
Systems Engineering	C/CPAF	Classified Contract : Classified Contract	8.818	3.500	Dec 2016	2.765	Dec 2017	4.307	Dec 2018	-		4.307	Continuing	Continuing	Continuing
Systems Engineering	WR	SSC PAC : San Diego, CA	4.278	1.125	Oct 2016	0.889	Oct 2017	1.385	Oct 2018	-		1.385	Continuing	Continuing	Continuing
Systems Engineering	WR	SSC LANT : Charleston, SC	5.567	1.300	Oct 2016	1.027	Oct 2017	1.600	Oct 2018	-		1.600	Continuing	Continuing	Continuing
Training Development	C/CPFF	Classified Contracts : Classified Contracts	0.000	0.000		0.265	Dec 2017	0.413	Dec 2018	-		0.413	Continuing	Continuing	Continuing
Configuration Management	WR	SSC LANT : Charleston, SC	0.000	0.000		0.790	Oct 2017	1.231	Oct 2018	-		1.231	Continuing	Continuing	Continuing
Training Development	WR	SSC LANT : Charleston, SC	0.000	0.000		0.224	Oct 2017	0.349	Oct 2018	-		0.349	Continuing	Continuing	Continuing
Integrated Logistic Support	WR	SSC LANT : Charleston, SC	0.000	0.000		0.632	Oct 2017	0.984	Oct 2018	-		0.984	Continuing	Continuing	Continuing
Requirements Analysis	WR	SSC LANT : Charleston, SC	0.000	0.000		0.395	Oct 2017	0.615	Oct 2018	-		0.615	Continuing	Continuing	Continuing
Studies & Design	WR	SSC PAC : Charleston, SC	0.000	0.000		0.790	Oct 2017	1.231	Oct 2018	-		1.231	Continuing	Continuing	Continuing
Requirements Analysis	C/CPFF	Classified Contracts : Classified Contracts	0.000	0.000		1.027	Dec 2017	1.600	Dec 2018	-		1.600	Continuing	Continuing	Continuing
Government Engineering Support	WR	SSC LANT : Charleston, SC	0.000	0.000		0.346	Oct 2017	0.539	Oct 2018	-		0.539	Continuing	Continuing	Continuing
Government Engineering Support	WR	SSC PAC : San Diego, CA	0.000	0.000		0.295	Oct 2017	0.460	Oct 2018	-		0.460	Continuing	Continuing	Continuing
Integration, Assembly & Test (PMP Dev)	WR	SSC PAC : San Diego, CA	3.343	1.300	Oct 2016	1.027	Oct 2017	1.600	Oct 2018	-		1.600	Continuing	Continuing	Continuing
Primary Hardware Development	C/CPFF	Classified Contracts : Classified Contracts	0.000	0.510	Dec 2016	1.026	Dec 2017	1.598	Dec 2018	-		1.598	Continuing	Continuing	Continuing
Hardware/Software Development	WR	NRL : Washington, DC	2.260	0.550	Oct 2016	0.435	Oct 2017	0.678	Oct 2018	-		0.678	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0304785N / *Tactical Cryptologic Systems*	Project (Number/Name) 2134 / *Shipboard IW Exploit*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	C/CPAF	Classified Contracts : Classified Contracts	35.419	10.165	Dec 2016	8.933	Dec 2017	13.911	Dec 2018	-		13.911	Continuing	Continuing	Continuing
Software Development	WR	SSC PAC : San Diego, CA	1.580	0.257	Oct 2016	0.203	Oct 2017	0.316	Oct 2018	-		0.316	Continuing	Continuing	Continuing
Integration, Assembly & Test	C/CPAF	Classified Contracts : Classified Contracts	2.871	0.363	Dec 2016	0.287	Dec 2017	0.447	Dec 2018	-		0.447	Continuing	Continuing	Continuing
Software Development	WR	SSC LANT : Charleston, SC	0.146	0.147	Oct 2016	0.116	Oct 2017	0.181	Oct 2018	-		0.181	Continuing	Continuing	Continuing
Integration, Assembly & Test (PMP Dev)	WR	SSC LANT : Charleston, SC	0.923	0.700	Oct 2016	0.553	Oct 2017	0.861	Oct 2018	-		0.861	Continuing	Continuing	Continuing
		Subtotal	223.535	19.917		22.025		34.306		-		34.306	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Prior Years	Various	Various : Various	4.572	0.000		0.000		0.000		-		0.000	0.000	4.572	-
Training Development	C/CPFF	Classified Contract : Classified Contract	1.383	0.335	Dec 2016	0.000		0.000		-		0.000	0.000	1.718	-
Integrated Logistics Support	C/CPFF	Classified Contract : Classified Contract	0.624	0.425	Dec 2016	0.593	Dec 2017	0.924	Dec 2018	-		0.924	Continuing	Continuing	Continuing
Configuration Management	WR	SSC LANT : Charleston, SC	1.960	0.302	Oct 2016	0.000		0.000		-		0.000	0.000	2.262	-
Configuration Management	WR	SSC PAC : San Diego, CA	0.840	0.345	Oct 2016	0.672	Oct 2017	1.047	Oct 2018	-		1.047	Continuing	Continuing	Continuing
Technical Data	WR	SSC PAC : San Diego, CA	2.007	0.500	Oct 2016	0.000		0.000		-		0.000	0.000	2.507	-
Training Development	WR	SSC LANT : Charleston, SC	0.388	0.283	Oct 2016	0.000		0.000		-		0.000	0.000	0.671	-
Integrated Logistic Support	WR	SSC LANT : Charleston, SC	0.704	0.510	Oct 2016	0.000		0.000		-		0.000	0.000	1.214	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	C/CPFF	Classified Contract : Classified Contract	0.000	0.000		1.822	Dec 2017	2.838	Dec 2018	-		2.838	Continuing	Continuing	Continuing
Requirements Analysis	WR	SSC LANT : Charleston, SC	0.254	0.300	Oct 2016	0.000		0.000		-		0.000	0.000	0.554	-
Studies & Design	WR	SSC PAC : San Diego, CA	0.679	1.000	Oct 2016	0.000		0.000		-		0.000	0.000	1.679	-
Studies & Design	C/CPFF	Classified Contract : Classified Contract	0.726	0.600	Dec 2016	0.474	Dec 2017	0.738	Dec 2018	-		0.738	Continuing	Continuing	Continuing
Requirements Analysis	C/CPFF	Classified Contract : Classified Contract	1.421	1.300	Dec 2016	0.000		0.000		-		0.000	0.000	2.721	-
		Subtotal	15.558	5.900		3.561		5.547		-		5.547	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation Prior Years	Various	Various : Various	15.024	0.000		0.000		0.000		-		0.000	0.000	15.024	-
Developmental Test & Evaluation	WR	SSC PAC : San Diego, CA	3.229	1.100	Oct 2016	0.550	Oct 2017	0.857	Oct 2018	-		0.857	Continuing	Continuing	Continuing
Developmental Test & Evaluation	WR	SSC LANT : Charleston, SC	1.739	0.421	Oct 2016	0.211	Oct 2017	0.329	Oct 2018	-		0.329	Continuing	Continuing	Continuing
Developmental Test & Evaluation	C/CPFF	Classified Contracts : Classified Contracts	2.021	1.000	Dec 2016	0.500	Dec 2017	0.779	Dec 2018	-		0.779	Continuing	Continuing	Continuing
		Subtotal	22.013	2.521		1.261		1.965		-		1.965	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

Management Services ($ in Millions)

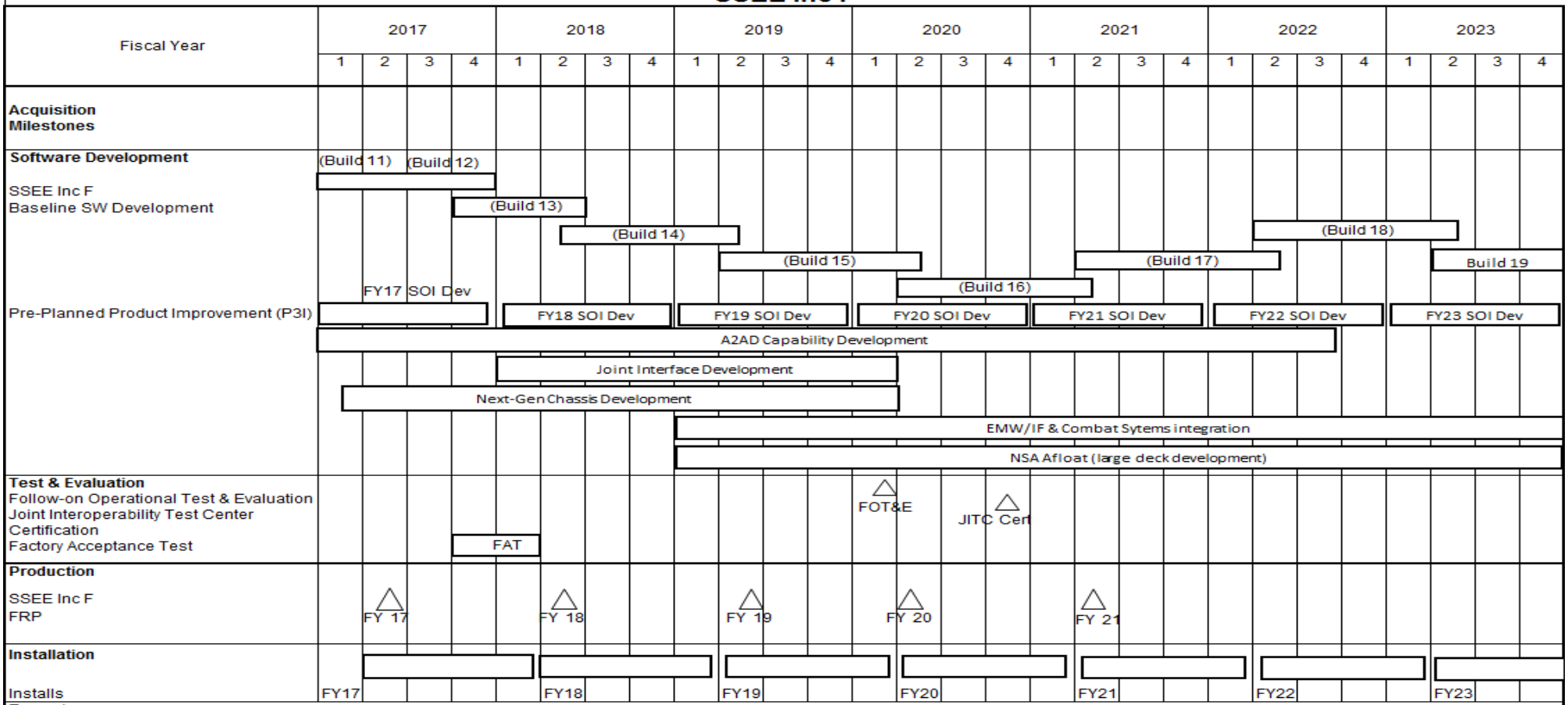
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Services Prior Years	Various	Various : Various	18.496	0.000		0.000		0.000		-		0.000	0.000	18.496	-
Contractor Engineering Support	C/CPFF	Classified Contract : Classified Contract	4.367	2.306	Dec 2016	0.000		0.000		-		0.000	0.000	6.673	-
Government Engineering Support	WR	SSC LANT : Charleston, SC	1.733	0.438	Oct 2016	0.000		0.000		-		0.000	0.000	2.171	-
Government Engineering Support	WR	SSC PAC : San Diego, CA	2.055	0.374	Oct 2016	0.000		0.000		-		0.000	0.000	2.429	-
Program Management Support	C/CPFF	Classified Contract : Classified Contract	2.227	0.900	Dec 2016	0.711	Dec 2017	1.107	Dec 2018	-		1.107	Continuing	Continuing	Continuing
Program Management Support	WR	SSC LANT : Charleston, SC	0.895	0.497	Oct 2016	0.397	Oct 2017	0.618	Oct 2018	-		0.618	Continuing	Continuing	Continuing
Travel	WR	SPAWAR : San Diego, CA	2.301	0.450	Oct 2016	0.356	Oct 2017	0.555	Oct 2018	-		0.555	Continuing	Continuing	Continuing
Studies & Design	FFRDC	Classified Contracts : Classified Contract	0.599	0.735	Dec 2016	0.000		0.000		-		0.000	0.000	1.334	-
		Subtotal	32.673	5.700		1.464		2.280		-		2.280	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	293.779	34.038		28.311		44.098		-		44.098	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

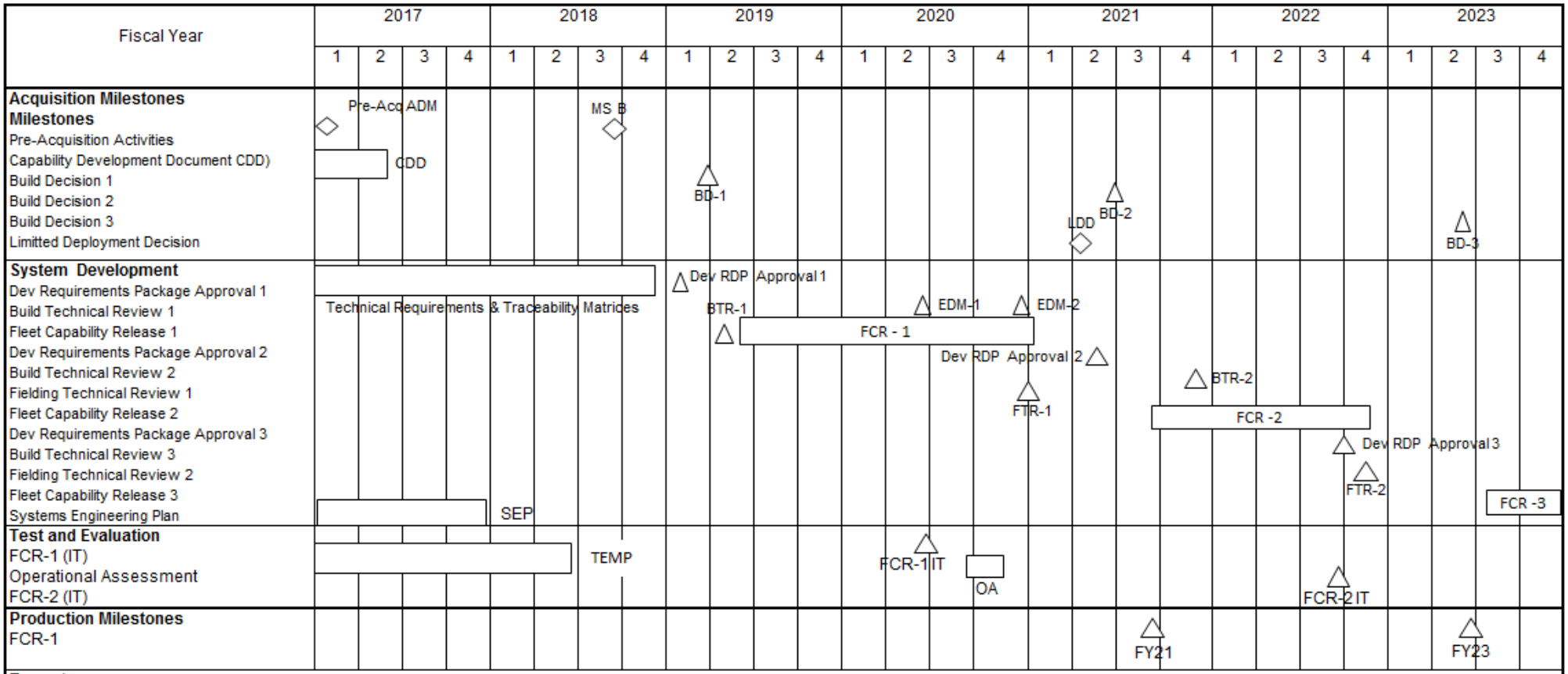
SSEE Inc F



Remarks:
1) Shipboard Information Warfare (IW) Exploit / 2134 (SSEE Inc F)
2) Production Milestones reflect contract award dates.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

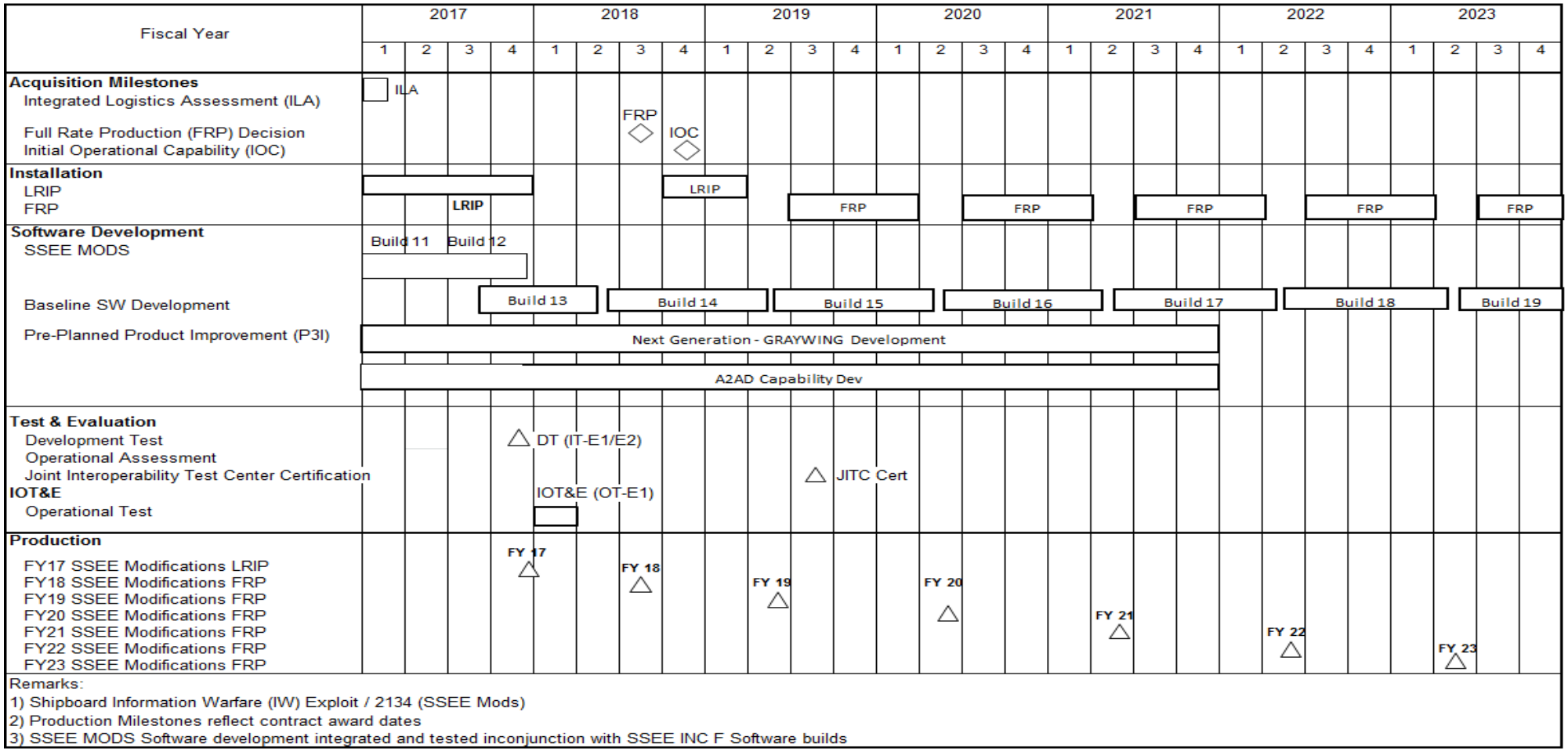
Spectral



Remarks:
Shipboard Information Warfare (IW) Exploit / 2134 (Spectral)
EDM milestones reflect delivery
Production Milestones reflect contract award dates

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

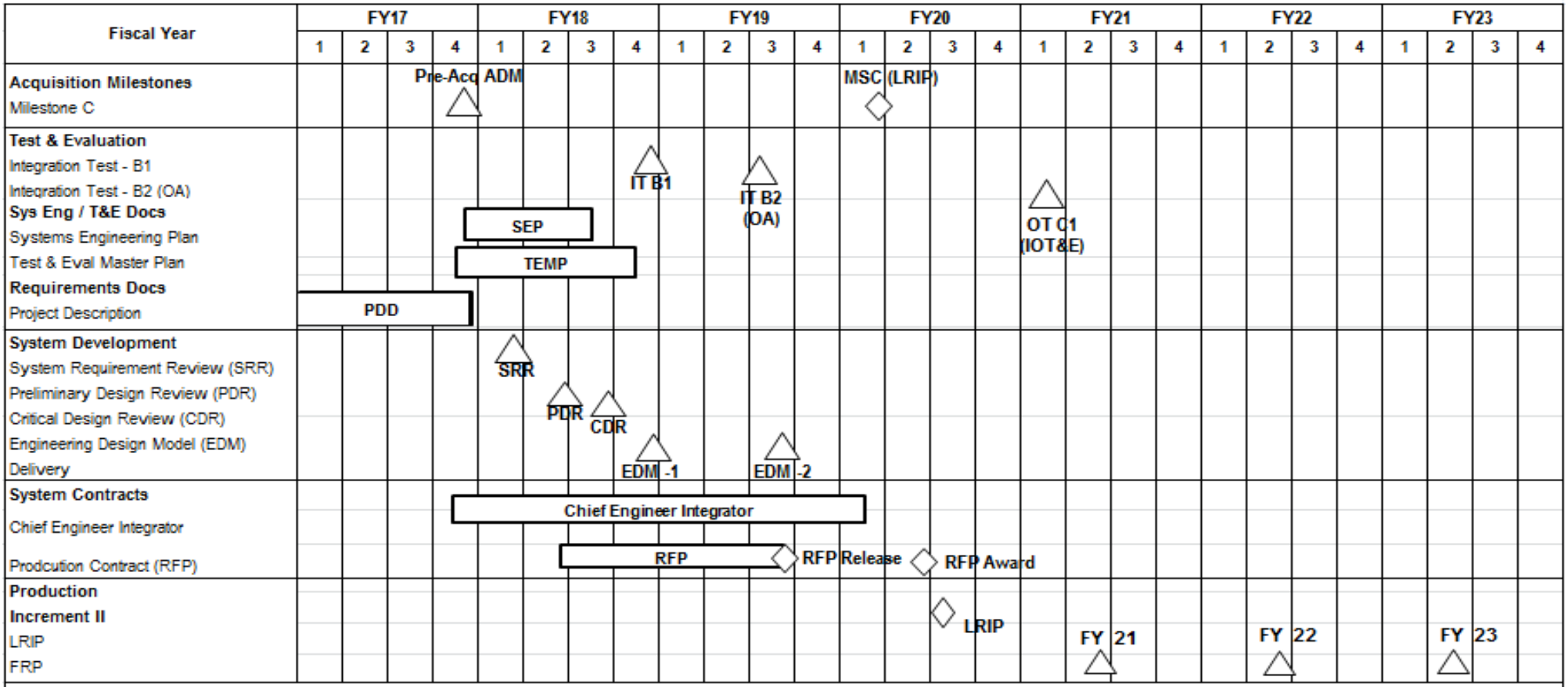
SSEE Mods



Remarks:
1) Shipboard Information Warfare (IW) Exploit / 2134 (SSEE Mods)
2) Production Milestones reflect contract award dates
3) SSEE MODS Software development integrated and tested inconjunction with SSEE INC F Software builds

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

ICADS INC II



Remarks:

1) Shipboard Information Warfare (IW) Exploit / 2134 (ICADS Inc II)

2) Production Milestones reflect contract award dates

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSEE Inc F				
Inc F - Joint Integration Test Command (JITC) Certification (FY20)	4	2020	4	2020
Inc F - Factory Acceptance Test (Inc F Variant)	4	2017	1	2018
Inc F - Follow On Test and Evaluation (FOT&E)	1	2020	1	2020
Inc F - FY17 FRP Production Milestone	2	2017	2	2017
Inc F - FY18 FRP Production Milestone	2	2018	2	2018
Inc F - FY19 FRP Production Milestone	2	2019	2	2019
Inc F - FY20 FRP Production Milestone	2	2020	2	2020
Inc F - FY21 FRP Production Milestone	2	2021	2	2021
Inc F - Software Development (FRP Build 11/12)	1	2017	4	2017
Inc F - Software Development (FRP Build 13)	3	2017	2	2018
Inc F - Software Development (FRP Build 14)	2	2018	2	2019
Inc F - Software Development (FRP Build 15)	2	2019	2	2020
Inc F - Software Development (FRP Build 16)	2	2020	2	2021
Inc F - Software Development (FRP Build 17)	2	2021	2	2022
Inc F - Software Development (FRP Build 18)	2	2022	2	2023
Inc F - Software Development (FRP Build 19)	2	2023	4	2023
Inc F - FY17 SOI Development	1	2017	4	2017
Inc F - FY18 SOI Development	1	2018	4	2018
Inc F - FY19 SOI Development	1	2019	4	2019
Inc F - FY20 SOI Development	1	2020	4	2020
Inc F - FY21 SOI Development	1	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Inc F - FY22 SOI Development	1	2022	4	2022
Inc F - FY23 SOI Development	1	2023	4	2023
Inc F - A2AD Capability Development	1	2017	3	2022
Inc F - Joint Interface Development	1	2018	1	2020
Inc F - Next-Gen Chassis Development	1	2017	1	2020
Inc F - EMW/IF & Combat Systems Integration	1	2019	4	2023
Inc F - NSA Afloat (Large Deck Development)	1	2019	4	2023
Inc F - FRP Installation FY17	1	2017	1	2018
Inc F - FRP Installation FY18	2	2018	1	2019
Inc F - FRP Installation FY19	2	2019	1	2020
Inc F - FRP Installation FY20	2	2020	1	2021
Inc F - FRP Installation FY21	2	2021	1	2022
Inc F - FRP Installation FY22	2	2022	1	2023
Inc F - FRP Installation FY23	2	2023	4	2023
Spectral (Increment G)				
Spectral - Milestone B	3	2018	3	2018
Spectral - Pre - Acquisition ADM	1	2017	1	2017
Spectral - Capability Development Document	1	2017	2	2017
Spectral - Build Decision 1	1	2019	1	2019
Spectral - Build Decision 2	2	2021	2	2021
Spectral - Build Decision 3	2	2023	2	2023
Spectral - Limitted Deployment Decision (LDD)	2	2021	2	2021
Spectral - Technical Requirements & Traceability Matrices	1	2017	4	2018
Spectral - Development Requirements Package Approval 1	1	2019	1	2019
Spectral - Development Requirements Package Approval 2	2	2021	2	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Spectral - Development Requirements Package Approval 3	3	2022	3	2022
Spectral - Build Technical Review 1	2	2019	2	2019
Spectral - Build Technical Review 2	4	2021	4	2021
Spectral - EDM - 1	2	2020	2	2020
Spectral - EDM - 2	4	2020	4	2020
Spectral - Fleet Capability Release 1	2	2019	1	2021
Spectral - Fleet Capability Release 2	3	2021	4	2022
Spectral - Fleet Capability Release 3	3	2023	4	2023
Spectral - Fielding Technical Review 1	4	2020	4	2020
Spectral - Fielding Technical Review 2	4	2022	4	2022
Spectral - Systems Engineering Plan	1	2017	4	2017
Spectral - FCR-1 (IT)	2	2020	2	2020
Spectral - FCR-2 (IT)	3	2022	3	2022
Spectral - Operational Assessment (OA)	3	2020	4	2020
Spectral - Test Evaluation Master Plan	1	2017	2	2018
Spectral - FCR-1 Production Milestone (FY21)	3	2021	3	2021
Spectral - FCR-1 Production Milestone (FY23)	2	2023	2	2023
SSEE Modifications				
SSEE Modifications - ILA	1	2017	1	2017
SSEE Modifications - Fielding Decision (FRP)	3	2018	3	2018
SSEE Modifications - Initial Operating Capability (IOC)	4	2018	4	2018
SSEE Modifications - LRIP Installation FY17	1	2017	4	2017
SSEE Modifications - LRIP Installation FY18	4	2018	1	2019
SSEE Modifications - LRIP/FRP Installation FY19	3	2019	1	2020
SSEE Modifications - FRP Installation FY20	3	2020	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSEE Modifications - FRP Installation FY21	3	2021	1	2022
SSEE Modifications - FRP Installation FY22	3	2022	1	2023
SSEE Modifications - FRP Installation FY23	3	2023	4	2023
SSEE Modifications - Software Development (FRP Build 11/12)	1	2017	4	2017
SSEE Modifications - Software Development (FRP Build 13)	3	2017	2	2018
SSEE Modifications - Software Development (FRP Build 14)	2	2018	2	2019
SSEE Modifications - Software Development (FRP Build 15)	2	2019	2	2020
SSEE Modifications - Software Development (FRP Build 16)	2	2020	2	2021
SSEE Modifications - Software Development (FRP Build 17)	2	2021	2	2022
SSEE Modifications - Software Development (FRP Build 18)	2	2022	2	2023
SSEE Modifications - Software Development (FRP Build 19)	2	2023	4	2023
SSEE Modifications - Next Generation GRAYWING Development	1	2017	4	2021
SSEE Modifications - Development Testing (IT-E1/E2)	4	2017	4	2017
SSEE Modifications - A2AD Capability Development	1	2017	4	2021
SSEE Modifications - Operational Testing (OT-E1)	1	2018	1	2018
SSEE Modifications - Joint Integration Test Command (JITC) Certification FY19	3	2019	3	2019
SSEE Modifications - FY17 LRIP Production Milestone	4	2017	4	2017
SSEE Modifications - FY18 FRP Production Milestone	3	2018	3	2018
SSEE Modifications - FY19 FRP Production Milestone	2	2019	2	2019
SSEE Modifications - FY20 FRP Production Milestone	2	2020	2	2020
SSEE Modifications - FY21 FRP Production Milestone	2	2021	2	2021
SSEE Modifications - FY22 FRP Production Milestone	2	2022	2	2022
SSEE Modifications - FY23 FRP Production Milestone	2	2023	2	2023
ICADS Inc II				
ICADS Inc II - Pre-Acquisition ADM	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0304785N / *Tactical Cryptologic Systems*	**Project (Number/Name)** 2134 / *Shipboard IW Exploit*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ICADS Inc II - Milestone C (LRIP)	1	2020	1	2020
ICADS Inc II - Integration Test - B1	4	2018	4	2018
ICADS Inc II - Integration Test - B2	3	2019	3	2019
ICADS Inc II - Systems Engineering Plan (SEP)	4	2017	3	2018
ICADS Inc II - Test Evaluation Master Plan (TEMP)	4	2017	4	2018
ICADS Inc II - Project Description Document (PDD)	1	2017	4	2017
ICADS Inc II - System Requirements Review (SRR)	1	2018	1	2018
ICADS Inc II - OT C1	1	2021	1	2021
ICADS Inc II - Preliminary Design Review (PDR)	2	2018	2	2018
ICADS Inc II - Critical Design Review (CDR)	3	2018	3	2018
ICADS Inc II - Engineering Design Model (EDM) #1	4	2018	4	2018
ICADS Inc II - Engineering Design Model (EDM) #2	3	2019	3	2019
ICADS Inc II - Chief Engineer Integration	4	2017	1	2020
ICADS Inc II - Request for Proposal (RFP)	2	2018	3	2019
ICADS Inc II - RFP Release	3	2019	3	2019
ICADS Inc II - RFP Award	2	2020	2	2020
ICADS Inc II - Low Rate Initial Production (LRIP)	3	2020	3	2020
ICADS Inc II - FY21 FRP Production Milestone	2	2021	2	2021
ICADS Inc II - FY22 FRP Production Milestone	2	2022	2	2022
ICADS Inc II - FY23 FRP Production Milestone	2	2023	2	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0305124N *I (U)Special Applications Program*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	81.220	35.002	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	116.222
3103: *Intelligence Engineering*	81.220	15.802	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	97.022
3419: *Technical Algorithm Development*	0.000	19.200	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.200

A. Mission Description and Budget Item Justification

Additional details with respect to this line item are held at a higher classification. This line item is reported to Congress via separate channels.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	35.002	0.000	0.000	-	0.000
Current President's Budget	35.002	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	0.000	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

Change Summary Explanation

Technical: Details held at higher classification.
Schedule: Details held at higher classification.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0305124N / *(U)Special Applications Program*	Project (Number/Name) 3103 / *Intelligence Engineering*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3103: *Intelligence Engineering*	81.220	15.802	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	97.022
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Additional details with respect to this line item are held at a higher classification. This line item is reported to Congress via separate channels.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0305124N / *(U)Special Applications Program*	Project (Number/Name) 3419 / *Technical Algorithm Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
3419: *Technical Algorithm Development*	0.000	19.200	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	19.200
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Additional details with respect to this line item are held at a higher classification. This line item is reported to Congress via separate channels.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0306250M *I (U)Cyber Operations Technology Development*

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	0.000	2.349	4.502	6.808	-	6.808	6.910	7.020	7.229	7.379	Continuing	Continuing
2958: *Cyberspace Activities*	0.000	2.349	4.502	6.808	-	6.808	6.910	7.020	7.229	7.379	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element supports cost associated with research, development, and modification of cyber technologies supporting Marine Corps Cyber Mission Forces (CMF) and missions assigned by USCYBERCOM.

The Strategic Cyber Security Operations Development is an initiative to conduct engineering and manufacturing development tasks aimed at the attainment and maintenance of the security properties of the Marine Corps and its assets against relevant security risks within the cyber environment. This project includes cyber security tools system development, integration, enhancement and demonstrations designed at protecting and defending the Marine Corps Enterprise Network (MCEN); defending national interests against cyberattacks of significant consequence; and providing integrated cyber capabilities to support military operations and contingency plans. The project incorporates development of strategic partnerships with defense intelligence agencies and commercial cyber security developers in order to leverage current and emerging cyber security technologies in defensive/offensive tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, and best practices that can be used to protect the Marine Corps' cyber domain; organization and user's assets. Marine Corps' organization and user's assets include connected computing devices, infrastructure, applications, services, telecommunications systems, and the totality of transmitted and/or stored information in the cyber environment.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.942	4.502	6.886	-	6.886
Current President's Budget	2.349	4.502	6.808	-	6.808
Total Adjustments	-2.593	0.000	-0.078	-	-0.078
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.093	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.078	-	-0.078
• Congressional Directed Reductions Adjustments	-2.500	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0306250M *I (U)Cyber Operations Technology Development*

Change Summary Explanation

The increase of $2.306 from FY18 to FY19 is to provide the full requirement of 13 tool developers and infrastructure development capability.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0306250M / *(U)Cyber Operations Technology Development*	Project (Number/Name) 2958 / *Cyberspace Activities*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
2958: *Cyberspace Activities*	0.000	2.349	4.502	6.808	-	6.808	6.910	7.020	7.229	7.379	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program element supports cost associated with research, development, and modification of cyber technologies supporting Marine Corps Cyber Mission Forces (CMF) and missions assigned by USCYBERCOM.

The Strategic Cyber Security Operations Development is an initiative to conduct engineering and manufacturing development tasks aimed at the attainment and maintenance of the security properties of the Marine Corps and its assets against relevant security risks within the cyber environment. This project includes cyber security tools system development, integration, enhancement and demonstrations designed at protecting and defending the Marine Corps Enterprise Network (MCEN); defending national interests against cyber attacks of significant consequence; and providing integrated cyber capabilities to support military operations and contingency plans. The project incorporates development of strategic partnerships with defense intelligence agencies and commercial cyber security developers in order to leverage current and emerging cyber security technologies in defensive/offensive tools, policies, security concepts, security safeguards, guidelines, risk management approaches, actions, training, and best practices that can be used to protect the Marine Corps' cyber domain; organization and user's assets. Marine Corps' organization and user's assets include connected computing devices, infrastructure, applications, services, telecommunications systems, and the totality of transmitted and/or stored information in the cyber environment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Cyber Tool Development	2.349	4.502	6.808	0.000	6.808
Articles:	-	-	-	-	-
FY 2018 Plans: Continue the cyber tool development process for MARFORCYBERCOM. The task requires complex and experienced skill sets in order to write code and perform: technology research, software and engineering development, integration of systems concepts, prevention of adversary presence, product development.					
FY 2019 Base Plans: Continue the cyber tool development process for MARFORCYBERCOM. The task requires complex and experienced skill sets in order to write code and perform: technology research, software and engineering development, integration of systems concepts, prevention of adversary presence, product development.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0306250M / *(U)Cyber Operations Technology Development*	**Project (Number/Name)** 2958 / *Cyberspace Activities*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The increase of $2.384M from FY18 to FY19 is to provide the full requirement of 13 tool developers and infrastructure development capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase of $2.306M from FY18 to FY19 is to provide the full requirement of 13 tool developers and infrastructure development capability.					
Accomplishments/Planned Programs Subtotals	2.349	4.502	6.808	0.000	6.808

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The funding will be used for contracted tool developers located at Fort Meade, Maryland and through the establishment of a contract with SPAWAR PACIFIC for the preponderance of the work. However,other vendors or government activities that are yet to be determined will be used in further infrastructure development for the cyber environment.

E. Performance Metrics

TBD during Program/Technical reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0306250M / *(U)Cyber Operations Technology Development*	**Project (Number/Name)** 2958 / *Cyberspace Activities*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tool Development	Various	NSA : Fort Meade	0.000	2.349	Jan 2017	4.502	Jan 2018	6.808	Jan 2019	-		6.808	Continuing	Continuing	Continuing
		Subtotal	0.000	2.349		4.502		6.808		-		6.808	Continuing	Continuing	N/A

Remarks

MARFORCYBER will continue previous efforts of providing tool developers and to support other development environment efforts, in order to support full spectrum cyberspace operations (offensive and defensive) mission requirements by developing software capabilities to protect the Marine Corps cyber domain and infrastructure development of the cyber environment. The increase of $2.306M from FY18 to FY19 is to provide the full requirement of 13 tool developers and infrastructure development capability.

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	2.349		4.502		6.808		-		6.808	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0306250M / *(U)Cyber Operations Technology Development*	**Project (Number/Name)** 2958 / *Cyberspace Activities*

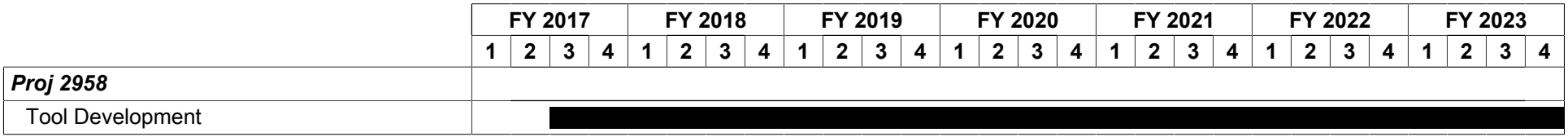

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0306250M / *(U)Cyber Operations Technology Development*	**Project (Number/Name)** 2958 / *Cyberspace Activities*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2958				
Tool Development	3	2017	4	2023

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