Department of Defense
Fiscal Year (FY) 2019 Budget Estimates

February 2018

Navy

Justification Book Volume 5 of 5

Research, Development, Test & Evaluation, Navy

Budget Activity 7

The estimated cost for this report for the Department of the Navy (DON) is $100,681.

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

THIS PAGE INTENTIONALLY LEFT BLANK

Volume 5 Table of Contents

Introduction and Explanation of Contents.....Volume 5 - v

Comptroller Exhibit R-1..... Volume 5 - vii

Master Program Element Table of Contents (by Budget Activity then Line Item Number).....Volume 5 - lxxvii

Master Program Element Table of Contents (Alphabetically by Program Element Title)..... Volume 5 - xcv

Program Element Table of Contents (by Budget Activity then Line Item Number).....Volume 5 - cix

Program Element Table of Contents (Alphabetically by Program Element Title).....Volume 5 - cxiii

Exhibit R-2's..... Volume 5 - 1

THIS PAGE INTENTIONALLY LEFT BLANK

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.

THIS PAGE INTENTIONALLY LEFT BLANK

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
(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 the Navy
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 the Navy
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 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
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
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
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
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

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
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**	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							

THIS PAGE INTENTIONALLY LEFT BLANK

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

THIS PAGE INTENTIONALLY LEFT BLANK

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
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

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

Program Element Title	Program Element Number	Line #	BA	Page
(U)Amphibious Assault Vehicle	0206629M	241	07	Volume 5 - 1015
(U)Common Aviation Command and Control Sys (CAC2S)	0206335M	237	07	Volume 5 - 757
(U)Cooperative Engagement Capability	0607658N	213	07	Volume 5 - 37
(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)Ground/Air Task Oriented Radar (G/ATOR)	0204460M	226	07	Volume 5 - 317
(U)MQ-4C Triton	0305220N	257	07	Volume 5 - 1179
(U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT	0305241N	262	07	Volume 5 - 1239
(U)RQ-21A	0305239M	261	07	Volume 5 - 1225
(U)RQ-4 Modernization	0305421N	264	07	Volume 5 - 1273
(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)	0305234N	260	07	Volume 5 - 1215
(U)Satellite Communications (SPACE)	1203109N	268	07	Volume 5 - 1337
(U)UAS Integration and Interoperability	0305205N	254	07	Volume 5 - 1135
(U)Unmanned Aerial Systems (UAS) Payloads	0305242M	263	07	Volume 5 - 1243
AMRAAM	0207163N	243	07	Volume 5 - 1039
Amphibious Tactical Supt Units	0204413N	225	07	Volume 5 - 303
Aviation Improvements	0205633N	234	07	Volume 5 - 527

Program Element Title	Program Element Number	Line #	BA	Page
Consolidated Afloat Network Ent Services(CANES)	0303138N	249	07	Volume 5 - 1079
Consolidated Trng Sys Dev	0204571N	227	07	Volume 5 - 333
Cryptologic Direct Support	0204574N	228	07	Volume 5 - 393
Depot Maintenance (NON-IF)	0702207N	266	07	Volume 5 - 1303
Distributed Common Ground Sys	0305208N	256	07	Volume 5 - 1159
Elect Warfare Readiness Supt	0204575N	229	07	Volume 5 - 403
F-35B C2D2	0604840M	211	07	Volume 5 - 9
F-35C C2D2	0604840N	212	07	Volume 5 - 23
F/A-18 Squadrons	0204136N	219	07	Volume 5 - 145
Fleet Tactical Development	0204163N	220	07	Volume 5 - 189
Global Combat Support Systems - Marine Corps	0219902M	244	07	Volume 5 - 1049
Harm Improvement	0205601N	230	07	Volume 5 - 429
Harpoon Modifications	0604227N	210	07	Volume 5 - 1
Information Sys Security Program	0303140N	250	07	Volume 5 - 1089
Integrated Surveillance System	0204311N	223	07	Volume 5 - 279
JT Military Intel Programs	0305192N	252	07	Volume 5 - 1121
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

Program Element Title	Program Element Number	Line #	BA	Page
Marine Corps Cmbt Services Supt	0206624M	239	07	Volume 5 - 909
Marine Corps Comms Systems	0206313M	236	07	Volume 5 - 589
Maritime Tech (MARITECH)	0708730N	267	07	Volume 5 - 1325
Modeling & Simulation Support	0308601N	265	07	Volume 5 - 1287
Navy Strategic Comms	0101402N	218	07	Volume 5 - 117
Operational Nuclear Power Sys	0205675N	235	07	Volume 5 - 587
RQ-11 UAV	0305232M	259	07	Volume 5 - 1205
SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS	0204313N	224	07	Volume 5 - 295
SSBN Security Tech Program	0101224N	216	07	Volume 5 - 103
Satellite Communications (Space)	0303109N	248	07	Volume 5 - 1055
Strategic Sub & Wpns Sys Supt	0101221N	215	07	Volume 5 - 71
Submarine Acoustic War Dev	0101226N	217	07	Volume 5 - 105
Surface ASW Cmbt Sys Integr	0205620N	232	07	Volume 5 - 497
Surface Support	0204228N	221	07	Volume 5 - 209
Tactical Aim Missiles	0207161N	242	07	Volume 5 - 1027
Tactical Data Links	0205604N	231	07	Volume 5 - 457
Tactical Unmanned Aer Vehicles	0305204N	253	07	Volume 5 - 1125
Tomahawk Mssn Planning Ctr	0204229N	222	07	Volume 5 - 223
USMC Intelligence/Electronics Warfare Sys	0206625M	240	07	Volume 5 - 971

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0604227N *I Harpoon Modifications*							
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	5.426	-	5.426	4.557	2.710	0.000	0.000	0.000	12.693
1843: *Harpoon Block II+*	0.000	0.000	0.000	5.426	-	5.426	4.557	2.710	0.000	0.000	0.000	12.693

Note

This is a new start in FY 2019

A. Mission Description and Budget Item Justification

The Harpoon Block II+ missile provides the Department of Navy (DON) with an expanded capability. Harpoon Block II+ missile kits are a Net Enabled, Air-Launched, Anti-ship Cruise weapon with the ability to receive in-flight updates that improve the targeting and engagement of moving maritime targets. This system utilizes global positioning to provide in-flight updates coupled with an active radar seeker to provide accurate targeting.

The Harpoon seeker upgrade effort will modernize current seeker configurations to increase the precision of targeting. Currently, Harpoon missiles contain 3700-3. The 3700-series seekers operate by sequentially searching a pre-defined Area of Uncertainty (AOU). The seeker was designed to detect, acquire and track any surface target that happens to be in that zone. A newer seeker provides value to the warfighter through significant improvements in the sequential search radar seekers' probability of acquiring the intended target. Improvements in 3700-4+ Electronic Protection capability significantly increases the probability of engaging a valid surface target in a complex environment.

The Harpoon seeker upgrade will develop a new seeker to convert old analog 3700-3 seekers to new digital seekers. The new seekers, "3700-4+" will implement the -4 functionality using newer, smaller and more reliable parts. The 3700-4+ seekers will replace the legacy Mode Control Board (MCB) with a Mode Control Expanded Interface (MCEI) board. The five circuit boards from the 3700-3 seeker will be replaced with four new boards. In order to allow better seeker functionality and enhanced target selection algorithms, and the Guidance Control Unit (GCU).

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0604227N *I Harpoon Modifications*	

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	5.426	-	5.426
Total Adjustments	0.000	0.000	5.426	-	5.426
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	5.501	-	5.501
• Rate/Misc Adjustments	0.000	0.000	-0.075	-	-0.075

Change Summary Explanation

This program is a new start in FY 2019 and provide funding for manufacturing, prototype and testing. FY 2019 funding supports the development of a new manufacturing process to upgrade legacy 3700-3 seekers. This effort includes factory acceptance tests, design verification tests, environmental tests and operational flight testing.

The FY 2019 funding request was reduced by $0.031 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: Not applicable.
Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0604227N / *Harpoon Modifications*	Project (Number/Name) 1843 / *Harpoon Block 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
1843: *Harpoon Block II+*	0.000	0.000	0.000	5.426	-	5.426	4.557	2.710	0.000	0.000	0.000	12.693
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Harpoon Block II+ missile provides the Department of Navy (DON) with an expanded capability. Harpoon Block II+ missile kits are a Net Enabled, Air-Launched, Anti-ship Cruise weapon with the ability to receive in-flight updates that improve the targeting and engagement of moving maritime targets. This system utilizes global positioning to provide in-flight updates coupled with an active radar seeker to provide accurate targeting.

The Harpoon seeker upgrade effort will modernize current seeker configurations to increase the precision of targeting. Currently, Harpoon missiles contain 3700-3. The 3700-series seekers operate by sequentially searching a pre-defined Area of Uncertainty (AOU). The seeker was designed to detect, acquire and track any surface target that happens to be in that zone. A newer seeker provides value to the warfighter through significant improvements in the sequential search radar seekers' probability of acquiring the intended target. Improvements in 3700-4+ Electronic Protection capability significantly increases the probability of engaging a valid surface target in a complex environment.

The Harpoon seeker upgrade will develop a new seeker manufacturing process to convert old analog 3700-3 seekers to new digital seekers. The new seekers, "3700-4+" will implement the -4 functionality using newer, smaller and more reliable parts. The 3700-4+ seekers will replace the legacy Mode Control Board (MCB) with a Mode Control Expanded Interface (MCEI) board. The five circuit boards from the 3700-3 seeker will be replaced with four new boards. In order to allow better seeker functionality and enhanced target selection algorithms, and the Guidance Control Unit (GCU).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Operational System Development	0.000	0.000	5.426	0.000	5.426
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: New Start will begin in FY 2019 and provide funding for manufacturing, prototype and testing. FY 2019 plan is to develop a new manufacturing process to upgrade legacy 3700-3 seekers. This effort includes factory acceptance tests, design verification tests, environmental tests and operational flight testing. The endstate is a production-ready seeker design.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604227N / *Harpoon Modifications*	**Project (Number/Name)** 1843 / *Harpoon Block II+*

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:*** As this is a New Start program, there is an increase of 5$.426 million from FY 2018 to FY 2019. FY 2019 provides funding for a new manufacturing process to upgrade legacy 3700-3 seekers.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.426	0.000	5.426

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
• 1507N/2326: *Harpoon Mods*	0.000	17.300	14.840	-	14.840	10.006	9.959	3.941	3.943	0.000	59.989

Remarks

D. Acquisition Strategy

The new seekers' improved digital technology, including more functionality in a reduced footprint and inclusion of a new seeker interface, will permit seamless addition and integration of future capability improvements in the Harpoon Block II+.

U.S. Navy will upgrade legacy Harpoon 3700-3 seekers using a unique process developed by L-3/Mustang to a Harpoon 3700-4+ seeker. The current Harpoon 3700-3 seekers are designed with antiquated analog technology, are out of production, incorporate obsolete sub-components, involve reliability concerns and represent significantly less seeker capability. The proposed solution will use the knowledge and technology demonstrated via SBIR N102-131 (Phases I and II) to develop a new seeker manufacturing process to convert old analog 3700-3 seekers to new digital seekers.
The Program Office plans on acquiring the developmental engineering and production assets as a sole source cost-plus incentive fee (CPIF) contract. Non-recurring engineering and production options will be priced separately.

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 / 7	R-1 Program Element (Number/Name) PE 0604227N / *Harpoon Modifications*	Project (Number/Name) 1843 / *Harpoon Block 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 Hardware Development	SS/CPIF	Mustang/L3 : Plano, TX	0.000	0.000		0.000		4.968	Feb 2019	-		4.968	6.610	11.578	11.578
		Subtotal	0.000	0.000		0.000		4.968		-		4.968	6.610	11.578	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 Support	WR	NAWC AD : Patuxent River, MD	0.000	0.000		0.000		0.229	Nov 2018	-		0.229	0.328	0.557	-
		Subtotal	0.000	0.000		0.000		0.229		-		0.229	0.328	0.557	N/A

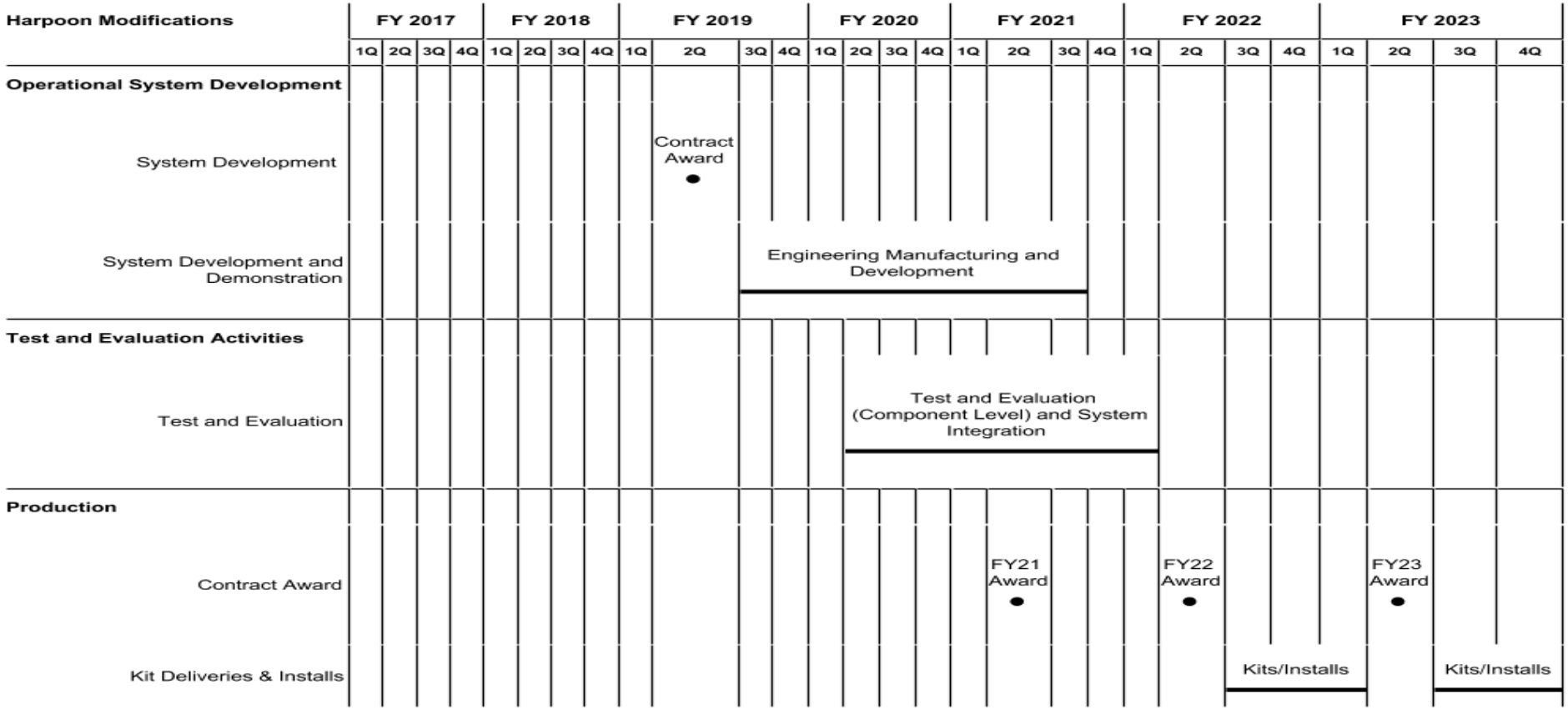
Test and Evaluation ($ in Millions)

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 Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.229	Nov 2018	-		0.229	0.329	0.558	-
		Subtotal	0.000	0.000		0.000		0.229		-		0.229	0.329	0.558	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		5.426		-		5.426	7.267	12.693	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604227N / *Harpoon Modifications*	**Project (Number/Name)** 1843 / *Harpoon Block II+*



2019PB - 0604227N - 1843

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604227N / *Harpoon Modifications*	**Project (Number/Name)** 1843 / *Harpoon Block II+*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Harpoon Modifications				
Operational System Development: System Development: Contract Award	2	2019	2	2019
Operational System Development: System Development and Demonstration: Engineering Manufacturing and Development	3	2019	3	2021
Test and Evaluation Activities: Test and Evaluation: Test and Evaluation (Component Level) and System Integration	2	2020	1	2022
Production: Contract Award: FY21 Award	2	2021	2	2021
Production: Contract Award: FY22 Award	2	2022	2	2022
Production: Contract Award: FY23 Award	2	2023	2	2023
Production: Kit Deliveries & Installs: Kits/Installs 1	3	2022	1	2023
Production: Kit Deliveries & Installs: Kits/Installs 2	3	2023	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0604840M *I F-35B 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
Total Program Element	0.000	0.000	0.000	259.122	-	259.122	228.719	189.038	122.592	125.044	Continuing	Continuing
3410: *F-35B C2D2*	0.000	0.000	0.000	259.122	-	259.122	228.719	189.038	122.592	125.044	Continuing	Continuing

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 Block 4 continues as Initial Operational Capability (IOC) is met for each variant during System Development and Demonstration (SDD).

The JSF Continuous Capability Development & Delivery(C2D2) efforts provide incremental warfighting capability improvements to maintain joint air dominance against evolving threats. Block 4 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 Block 4 (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 required to deliver full air system Block 4 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 0604840M/N replacing PE 0604810M/N beginning in FY19 due to budget being moved 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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0604840M *I F-35B C2D2*	

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	259.122	-	259.122
Total Adjustments	0.000	0.000	259.122	-	259.122
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	259.122	-	259.122

Change Summary Explanation

PE 0604840M/N replacing PE 0604810M/N beginning in FY19 due to budget being moved from BA05 to BA07.

Technical: Not applicable.
Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0604840M / *F-35B C2D2*	Project (Number/Name) 3410 / *F-35B 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
3410: *F-35B C2D2*	0.000	0.000	0.000	259.122	-	259.122	228.719	189.038	122.592	125.044	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 198

Note

Total cost, including International partner contributions, USN, USMC, and USAF funding: FY2019; $1,141.901M.

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	0.000	0.000	420.931	0.000	420.931
Articles:	-	-	-	-	-
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					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840M / *F-35B C2D2*	**Project (Number/Name)** 3410 / *F-35B C2D2*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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:*** N/A ***FY 2019 Base Plans:*** Continued from PE 0604810M/N. Continue Block 4 Phase II contract development. Conduct Block 4.1 PDR and Block 4.2 SRR, as well as continuing Post-PDR risk reduction and planning. ***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. Increase due continued Block 4 Phase 2.2 Development to include conducting Block 4.1 PDR and Block 4.2 SRR, as well as continuing Post-PDR risk reduction and planning. Prime Propulsion contract begins in FY19.					
Title: Product Development - Technology Refresh 3 (TR-3) ***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	0.000 -	0.000 -	175.696 -	0.000 -	175.696 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840M / *F-35B C2D2*	**Project (Number/Name)** 3410 / *F-35B 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:*** N/A ***FY 2019 Base Plans:*** Continued from PE 0604810M/N. 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 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. Increase due to continued ramping up of TR-3 effort to include initial lab stand up beginning in FY19.					
Title: Infrastructure and Support Costs	0.000	0.000	244.520	0.000	244.520
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:*** N/A ***FY 2019 Base Plans:*** Continued from PE 0604810M/N.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840M / *F-35B C2D2*	**Project (Number/Name)** 3410 / *F-35B C2D2*

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 support for defining, managing and acquiring the F-35 capability enhancements identified in approved requirements documents. Transfer of integrated test force requirement to Continuous Capability Development and Delivery (C2D2) F-35 SDD draws to closure. ***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. Increase due to awarding of Prime Infrastructure contract beginning in FY19.					
Title: Test and Evaluation	0.000	0.000	300.754	0.000	300.754
Articles:	-	-	-	-	-
Description: Developmental Test activities in support of Block 4. 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 more production representative and sustainable 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). ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Continued from PE 0604810M/N. Funding will support flight test execution to ensure Block 4 capabilities are delivered as designed. Funding also supports investment planning and prioritization required to maintain future development capabilities. This includes instrumenting new DT aircraft, ordering the replacement of pre-LRIP aircraft engines, continuing the FY18 NRE work, and delivery and install of upgraded hardware as a part of the DT aircraft viability effort. Additionally, this funding supports laboratory upgrades required to support development and verification of capabilities in a relevant environment. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0604840M / *F-35B C2D2*	**Project (Number/Name)** 3410 / *F-35B 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. Increase due to continued Test and Evaluation effort to include supporting laboratory upgrades required to support development and verification of capabilities and the delivery and install of upgraded hardware as a part of the DT aircraft viability effort.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	1,141.901	0.000	1,141.901
0207142F JSF Continuous Capability Development and Delivery	-	-	472.067	-	472.067
0604840M JSF Continuous Capability Development and Delivery	-	-	252.360	-	252.360
International Continuous Capability Development and Delivery	-	-	158.352	-	158.352
Navy Subtotals	0.000	0.000	259.122	0.000	259.122

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/0604840N/2936: *F-35C Follow On Modernization - Marine Corps*	0.000	0.000	252.360	-	252.360	223.901	184.210	117.189	119.602	Continuing	Continuing
• USAF/FOM/0207142F: *USAF Continuous Capability Development and Delivery*	0.000	0.000	472.067	-	472.067	507.159	415.855	278.532	281.315	Continuing	Continuing
• International: *International Continuous Capability Development and Delivery*	0.000	0.000	158.352	-	158.352	160.705	166.023	158.811	158.110	0.000	802.001

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.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840M / *F-35B C2D2*	**Project (Number/Name)** 3410 / *F-35B C2D2*

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 / 7	R-1 Program Element (Number/Name) PE 0604840M / *F-35B C2D2*	Project (Number/Name) 3410 / *F-35B 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	0.000		0.000		278.448	Dec 2018	-		278.448	1,031.289	1,309.737	1,309.737
Prime LM 14-G-0020 (TR3)	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		175.696	Dec 2018	-		175.696	510.000	685.696	685.696
Prime LM BOA 0020 (Nimble Lightning + Pilot Training)	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		4.760	Mar 2019	-		4.760	17.500	22.260	22.260
Flight Test Asset	Various	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		85.346	Jan 2019	-		85.346	406.000	491.346	491.346
Prime LM IDIQ TBD (ECASE)	C/BA	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		69.850	Jan 2019	-		69.850	168.000	237.850	237.850
Prime LM TBD DT AC Viability	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		100.100	Jan 2019	-		100.100	415.000	515.100	515.100
Systems Engineering	Various	Various : Various	0.000	0.000		0.000		18.423	Jan 2019	-		18.423	88.000	106.423	106.423
Prime PW Propulsion	SS/CPFF	Pratt Whitney : TBD	0.000	0.000		0.000		49.450	Feb 2019	-		49.450	220.000	269.450	269.450
Prime LM Infrastructure	C/BA	ockheed Martin : FT. Worth, TX	0.000	0.000		0.000		100.550	Nov 2018	-		100.550	345.000	445.550	445.550
		Subtotal	0.000	0.000		0.000		882.623		-		882.623	3,200.789	4,083.412	N/A

Remarks

FY19 Product Development continued from PE 0604810M/N.
Block 4 Modernization on R-2A includes Phase II, Nimble Lightning, ECASE, Systems Engineering & Propulsion.

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	0.000	0.000		0.000		16.839	Dec 2018	-		16.839	Continuing	Continuing	Continuing
Development Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		9.574	Dec 2018	-		9.574	43.083	52.657	-
Development Support	Various	Edwards AFB : Edwards AFB, CA	0.000	0.000		0.000		4.050	Dec 2018	-		4.050	14.175	18.225	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0604840M / *F-35B C2D2*	Project (Number/Name) 3410 / *F-35B 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	Eglin : Various	0.000	0.000		0.000		3.393	Dec 2018	-		3.393	15.268	18.661	-
Development Support	Various	Various : Various	0.000	0.000		0.000		9.861	Dec 2018	-		9.861	34.513	44.374	-
Development Support	MIPR	AFLCMC : Wright Patterson AFB	0.000	0.000		0.000		3.978	Dec 2018	-		3.978	13.923	17.901	-
		Subtotal	0.000	0.000		0.000		47.695		-		47.695	Continuing	Continuing	N/A

Remarks

FY19 Support continued from PE 0604810M/N.

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		0.000		43.744	Dec 2018	-		43.744	174.872	218.616	-
Developmental Test & Evaluation	WR	NAWCWD : China Lake , CA	0.000	0.000		0.000		11.563	Dec 2018	-		11.563	40.470	52.033	-
Developmental Test & Evaluation Edwards/AFB	Various	Edwards AFB : Edwards AFB, CA	0.000	0.000		0.000		31.563	Dec 2018	-		31.563	110.470	142.033	-
Developmental Test & Evaluation	Various	Various : Various	0.000	0.000		0.000		12.813	Dec 2018	-		12.813	57.087	69.900	-
Operational Test & Evaluation	WR	Kirtland AFB, NM : Kirtland AFB, NM	0.000	0.000		0.000		15.625	Dec 2018	-		15.625	72.500	88.125	-
		Subtotal	0.000	0.000		0.000		115.308		-		115.308	455.399	570.707	N/A

Remarks

FY19 Test and Evaluation continued from PE 0604810M/N.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840M / *F-35B C2D2*	**Project (Number/Name)** 3410 / *F-35B 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	0.000		0.000		46.265	Dec 2018	-		46.265	231.610	277.875	-
Financial Mgmt Database Support IDS	Various	Various : Various	0.000	0.000		0.000		0.850	Dec 2018	-		0.850	4.301	5.151	-
Earned Value/Finance/ Cost ACT-I	Various	Various : Various	0.000	0.000		0.000		5.100	Dec 2018	-		5.100	23.518	28.618	-
CIO BOS	Various	Various : Various	0.000	0.000		0.000		22.500	Dec 2018	-		22.500	95.066	117.566	-
Systems System High BOS	Various	Various : Various	0.000	0.000		0.000		9.500	Dec 2018	-		9.500	45.342	54.842	-
Other CIO Services	Various	Various : Various	0.000	0.000		0.000		8.622	Dec 2018	-		8.622	22.579	31.201	-
Travel	Various	Various : Various	0.000	0.000		0.000		3.438	Dec 2018	-		3.438	8.569	12.007	-
		Subtotal	0.000	0.000		0.000		96.275		-		96.275	430.985	527.260	N/A

Remarks

FY19 Management Services continued from PE 0604810M/N.

	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	0.000	0.000		0.000		1,141.901		-		1,141.901	Continuing	Continuing	N/A
0207142F JSF Continuous Capability Development and Delivery	-	-		-		472.067		-		472.067			-
0604840M JSF Continuous Capability Development and Delivery	-	-		-		252.360		-		252.360			-
International Continuous Capability Development and Delivery	-	-		-		158.352		-		158.352			-
Project Cost Totals	0.000	0.000		0.000		259.122		-		259.122	0.000	0.000	-

Remarks

Subtotals and totals may not add due to rounding.

Prior Year reflects $0M due to PE 0604810M/N ending in FY18 and being replaced by PE 0604840M/N in FY19 as budget moves from BA05 to BA07.

FY 2019 reflects $472.067M USAF/$252.360M USN/$259.122M USMC/$158.352M International/Total $1,141.901M

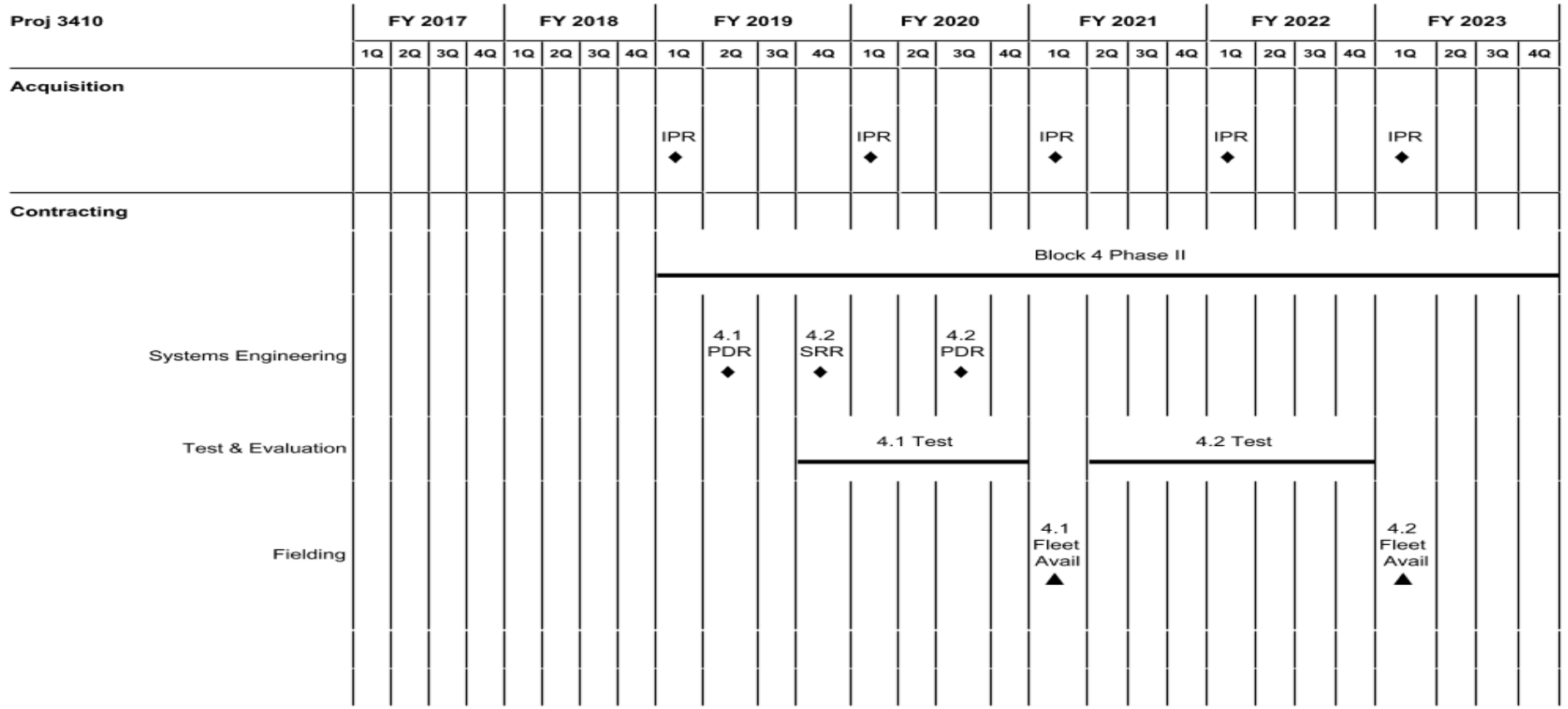
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0604840M / *F-35B C2D2*	Project (Number/Name) 3410 / *F-35B C2D2*	

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract

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 - ends FY18
USMC PE 0604810M Project Unit 2935 - ends FY18
USN PE 0604840N Project Unit 2936 - begins FY19
USMC PE 0604840M Project Unit 2935 - begins FY19
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 / 7	**R-1 Program Element (Number/Name)** PE 0604840M / *F-35B C2D2*	**Project (Number/Name)** 3410 / *F-35B C2D2*



2019PB - 0604840M - 3410

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840M / *F-35B C2D2*	**Project (Number/Name)** 3410 / *F-35B C2D2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3410				
Acquisition: Interim Program Review (IPR) FY19	1	2019	1	2019
Acquisition: Interim Program Review (IPR) FY20	1	2020	1	2020
Acquisition: Interim Program Review (IPR) FY21	1	2021	1	2021
Acquisition: Interim Program Review (IPR) FY22	1	2022	1	2022
Acquisition: Interim Program Review (IPR) FY23	1	2023	1	2023
Contracting: Block 4 Phase II	1	2019	4	2023
Contracting: Systems Engineering: 4.1 Preliminary Design Review (PDR)	2	2019	2	2019
Contracting: Systems Engineering: 4.2 Preliminary Design Review (PDR)	3	2020	3	2020
Contracting: Systems Engineering: 4.2 System Requirements Review (SRR)	4	2019	4	2019
Contracting: Test & Evaluation: Test & Evaluation: 4.1 Test	4	2019	4	2020
Contracting: Test & Evaluation: Test & Evaluation: 4.2 Test	2	2021	4	2022
Contracting: Fielding: Block 4.1 Fleet Availability	1	2021	1	2021
Contracting: Fielding: Block 4.2 Fleet Availability	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0604840N *I 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**
Total Program Element	0.000	0.000	0.000	252.360	-	252.360	223.901	184.210	117.189	119.602	Continuing	Continuing
2936: *F-35C C2D2*	0.000	0.000	0.000	252.360	-	252.360	223.901	184.210	117.189	119.602	Continuing	Continuing

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 Block 4 continues as Initial Operational Capability (IOC) is met for each variant during System Development and Demonstration (SDD).

The JSF Continuous Capability Development & Delivery(C2D2) efforts provide incremental warfighting capability improvements to maintain joint air dominance against evolving threats. Block 4 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 Block 4 (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 required to deliver full air system Block 4 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 0604840M/N replacing PE 0604810M/N beginning in FY19 due to budget being moved 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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0604840N *I F-35C C2D2*	

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	252.360	-	252.360
Total Adjustments	0.000	0.000	252.360	-	252.360
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	252.360	-	252.360

Change Summary Explanation

PE 0604840M/N replacing PE 0604810M/N beginning in FY19 due to budget being moved from BA05 to BA07.

Technical: Not applicable.
Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0604840N / *F-35C C2D2*	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*	0.000	0.000	0.000	252.360	-	252.360	223.901	184.210	117.189	119.602	Continuing	Continuing
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.

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	0.000	0.000	420.931	0.000	420.931
Articles:	-	-	-	-	-
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					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**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
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:*** N/A ***FY 2019 Base Plans:*** Continued from PE 0604810M/N. Continue Block 4 Phase II contract development. Conduct Block 4.1 PDR and Block 4.2 SRR, as well as continuing Post-PDR risk reduction and planning. ***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. Increase due continued Block 4 Phase 2.2 Development to include conducting Block 4.1 PDR and Block 4.2 SRR, as well as continuing Post-PDR risk reduction and planning. Prime Propulsion contract begins in FY19.					
Title: Product Development - Technology Refresh 3 (TR-3) ***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	0.000 -	0.000 -	190.250 -	0.000 -	190.250 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**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:*** N/A ***FY 2019 Base Plans:*** Continued from PE 0604810M/N. 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 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. Increase due to continued ramping up of TR-3 effort to include initial lab stand up beginning in FY19.					
Title: Infrastructure and Support Costs	0.000	0.000	244.520	0.000	244.520
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:*** N/A ***FY 2019 Base Plans:*** Continued from PE 0604810M/N.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**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
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 Continuous Capability Development and Delivery (C2D2) F-35 SDD draws to closure. ***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. Increase due to awarding of Prime Infrastructure contract beginning in FY19.					
Title: Test and Evaluation	0.000	0.000	300.754	0.000	300.754
Articles:	-	-	-	-	-
Description: Developmental Test activities in support of Block 4. 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 more production representative and sustainable 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). ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Continued from PE 0604810M/N. Funding will support flight test execution to ensure Block 4 capabilities are delivered as designed. Funding also supports investment planning and prioritization required to maintain future development capabilities. This includes instrumenting new DT aircraft, ordering the replacement of pre-LRIP aircraft engines, continuing the FY18 NRE work, and delivery and install of upgraded hardware as a part of the DT aircraft viability effort. Additionally, this funding supports laboratory upgrades required to support development and verification of capabilities in a relevant environment. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**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. Increase due to continued Test and Evaluation effort to include supporting laboratory upgrades required to support development and verification of capabilities and the delivery and install of upgraded hardware as a part of the DT aircraft viability effort.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	1,156.455	0.000	1,156.455
0207142F JSF Continuous Capability Development and Delivery	-	-	475.621	-	475.621
0604840M JSF Continuous Capability Development and Delivery	-	-	270.122	-	270.122
International Continuous Capability Development and Delivery	-	-	158.352	-	158.352
Navy Subtotals	0.000	0.000	252.360	0.000	252.360

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/0604840M/2935: *F-35C Follow On Modernization - Marine Corps*	0.000	0.000	270.122	-	270.122	228.719	189.038	122.592	125.044	Continuing	Continuing
• USAF/FOM/0207142F: *USAF Continuous Capability Development and Delivery*	0.000	0.000	472.067	-	472.067	507.151	415.855	278.532	281.315	Continuing	Continuing
• International: *International Continuous Capability Development and Delivery*	0.000	0.000	158.352	-	158.352	160.705	166.023	158.811	158.110	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 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.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**Project (Number/Name)** 2936 / *F-35C C2D2*

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 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**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	0.000		0.000		278.448	Dec 2018	-		278.448	1,031.289	1,309.737	-
Prime LM 14-G-0020(TR3)	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		190.250	Dec 2018	-		190.250	510.000	700.250	-
Prime LM BOA 0020 (Nimble Lightning + Pilot Training)	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		4.760	Mar 2019	-		4.760	17.500	22.260	-
Flight Test Asset	Various	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		85.346	Jan 2019	-		85.346	406.000	491.346	-
Prime LM IDIQ TBD (ECASE)	C/BA	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		69.850	Jan 2019	-		69.850	168.000	237.850	-
Prime LM TBD DT AC Viability	C/CPFF	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		100.100	Jan 2019	-		100.100	415.000	515.100	-
Systems Engineering	Various	Various : Various	0.000	0.000		0.000		18.423	Jan 2019	-		18.423	88.000	106.423	-
Prime PW Propulsion	SS/CPFF	Pratt whitney : TBD	0.000	0.000		0.000		49.450	Feb 2019	-		49.450	220.000	269.450	-
Prime LM Infrastructure	C/BA	Lockheed Martin : FT. Worth, TX	0.000	0.000		0.000		100.550	Nov 2018	-		100.550	345.000	445.550	-
		Subtotal	0.000	0.000		0.000		897.177		-		897.177	3,200.789	4,097.966	N/A

Remarks

FY19 Product Development continued from PE 0604810M/N.
Block 4 Modernization on R-2A includes Phase II, Nimble Lightning, ECASE, Systems Engineering & Propulsion.

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	0.000	0.000		0.000		16.839	Dec 2018	-		16.839	Continuing	Continuing	Continuing
Development Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		9.574	Dec 2018	-		9.574	43.083	52.657	-
Development Support	Various	Edwards AFB : Edwards AFB, CA	0.000	0.000		0.000		4.050	Dec 2018	-		4.050	14.175	18.225	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**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	Eglin : Various	0.000	0.000		0.000		3.393	Dec 2018	-		3.393	15.268	18.661	-
Development Support	Various	Various : Various	0.000	0.000		0.000		9.861	Dec 2018	-		9.861	34.513	44.374	-
Development Support	MIPR	AFLCMC : Wright Patterson AFB	0.000	0.000		0.000		3.978	Dec 2018	-		3.978	13.923	17.901	-
		Subtotal	0.000	0.000		0.000		47.695		-		47.695	Continuing	Continuing	N/A

Remarks

FY19 Support continued from PE 0604810M/N.

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		0.000		43.744	Dec 2018	-		43.744	174.872	218.616	-
Developmental Test & Evaluation	WR	NAWCWD : China Lake , CA	0.000	0.000		0.000		11.563	Dec 2018	-		11.563	40.470	52.033	-
Developmental Test & Evaluation Edwards/AFB	Various	Edwards AFB : Edwards AFB, CA	0.000	0.000		0.000		31.563	Dec 2018	-		31.563	110.470	142.033	-
Developmental Test & Evaluation	Various	Various : Various	0.000	0.000		0.000		12.813	Dec 2018	-		12.813	57.087	69.900	-
Operational Test & Evaluation	WR	Kirtland AFB, NM : Kirtland AFB, NM	0.000	0.000		0.000		15.625	Dec 2018	-		15.625	72.500	88.125	-
		Subtotal	0.000	0.000		0.000		115.308		-		115.308	455.399	570.707	N/A

Remarks

FY19 Test and Evaluation continued from PE 0604810M/N.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**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	C/BA	AFLCMC CIVPAY : Wright Patterson, AFB	0.000	0.000		0.000		46.265	Dec 2018	-		46.265	231.610	277.875	-
Financial Mgmt Database Support IDS	C/BA	Various : Various	0.000	0.000		0.000		0.850	Dec 2018	-		0.850	4.301	5.151	-
Earned Value/Finance/ Cost ACT-I	C/BA	Various : Various	0.000	0.000		0.000		5.100	Dec 2018	-		5.100	23.518	28.618	-
CIO BOS	C/BA	Various : Various	0.000	0.000		0.000		22.500	Dec 2018	-		22.500	95.066	117.566	-
Systems System High BOS	C/BA	Various : Various	0.000	0.000		0.000		9.500	Dec 2018	-		9.500	45.342	54.842	-
Other CIO Services	C/BA	Various : Various	0.000	0.000		0.000		8.622	Dec 2018	-		8.622	22.579	31.201	-
Travel	Various	Various : Various	0.000	0.000		0.000		3.438	Oct 2018	-		3.438	8.569	12.007	-
		Subtotal	0.000	0.000		0.000		96.275		-		96.275	430.985	527.260	N/A

Remarks

FY19 Management Services continued from PE 0604810M/N.

	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	0.000	0.000		0.000		1,156.455		-		1,156.455	Continuing	Continuing	N/A
0207142F JSF Continuous Capability Development and Delivery	-	-		-		475.621		-		475.621			-
0604840M JSF Continuous Capability Development and Delivery	-	-		-		270.122		-		270.122			-
International Continuous Capability Development and Delivery	-	-		-		158.352		-		158.352			-
Project Cost Totals	0.000	0.000		0.000		252.360		-		252.360	0.000	0.000	-

Remarks

Subtotals and totals may not add due to rounding.

Prior Year reflects $0M due to PE 0604810M/N ending in FY18 and being replaced by PE 0604840M/N in FY19 as budget moves from BA05 to BA07.

FY 2019 reflects $475.621M USAF/$252.360M USN/$270.122M USMC/$158.352M International/Total $1,156.455M

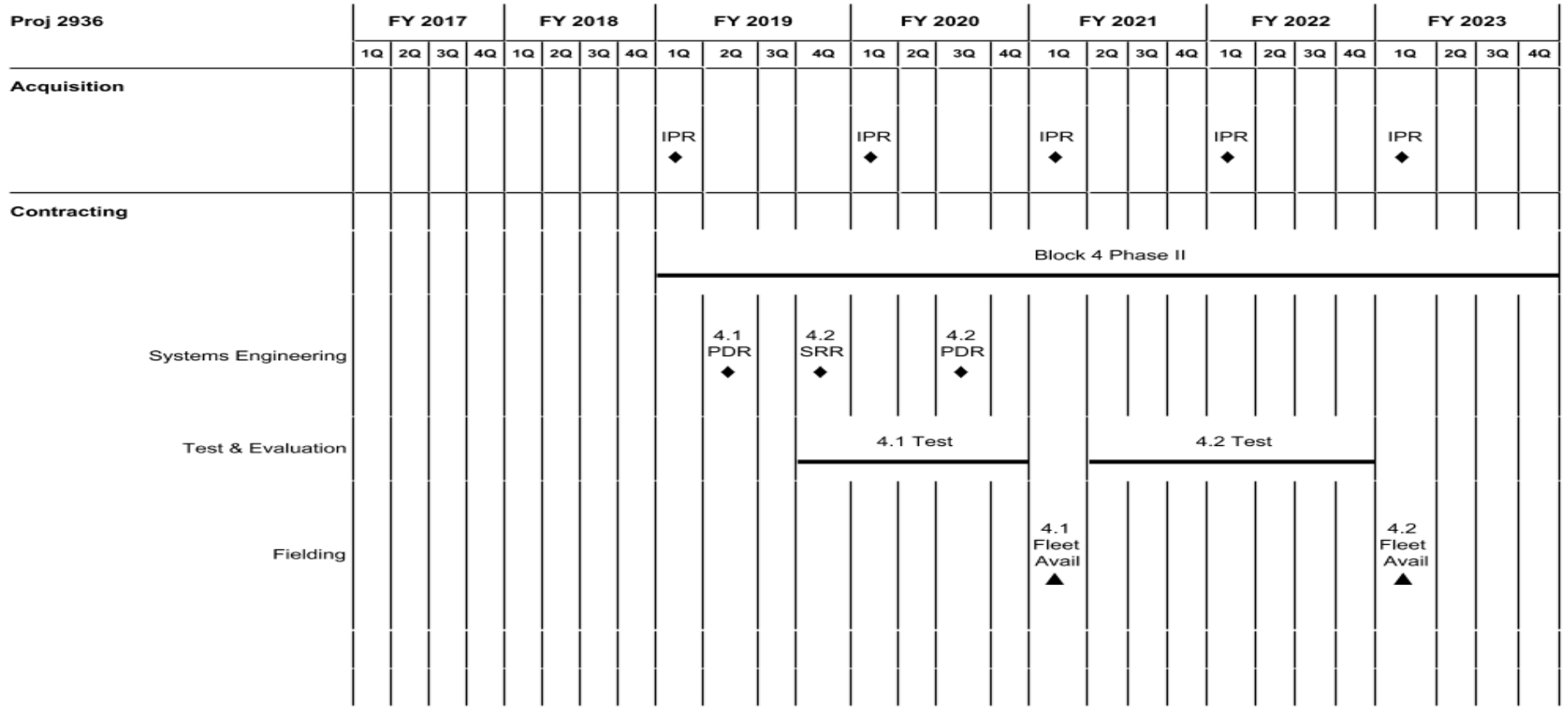
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0604840N / *F-35C C2D2*	Project (Number/Name) 2936 / *F-35C C2D2*	

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract

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 - ends FY18
USMC PE 0604810M Project Unit 2935 - ends FY18
USN PE 0604840N Project Unit 2936 - begins FY19
USMC PE 0604840M Project Unit 2935 - begins FY19
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 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**Project (Number/Name)** 2936 / *F-35C C2D2*



2019PB - 0604840N - 2936

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0604840N / *F-35C C2D2*	**Project (Number/Name)** 2936 / *F-35C C2D2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2936				
Acquisition: Interim Program Review (IPR) FY19	1	2019	1	2019
Acquisition: Interim Program Review (IPR) FY20	1	2020	1	2020
Acquisition: Interim Program Review (IPR) FY21	1	2021	1	2021
Acquisition: Interim Program Review (IPR) FY22	1	2022	1	2022
Acquisition: Interim Program Review (IPR) FY23	1	2023	1	2023
Contracting: Block 4 Phase II	1	2019	4	2023
Contracting: Systems Engineering: 4.1 Preliminary Design Review (PDR)	2	2019	2	2019
Contracting: Systems Engineering: 4.2 Preliminary Design Review (PDR)	3	2020	3	2020
Contracting: Systems Engineering: 4.2 System Requirements Review (SRR)	4	2019	4	2019
Contracting: Test & Evaluation: Test & Evaluation: 4.1 Test	4	2019	4	2020
Contracting: Test & Evaluation: Test & Evaluation: 4.2 Test	2	2021	4	2022
Contracting: Fielding: Block 4.1 Fleet Availability	1	2021	1	2021
Contracting: Fielding: Block 4.2 Fleet Availability	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607658N *I (U)Cooperative Engagement Capability*							
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	601.250	75.099	92.571	130.515	-	130.515	141.373	147.710	125.458	121.220	Continuing	Continuing
2039: *COOP Engagement*	601.250	75.099	92.571	130.515	-	130.515	141.373	147.710	125.458	121.220	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 582												

A. Mission Description and Budget Item Justification

Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture to support integrated fire control.

CEC distributes sensor data from each USMC Command Control Unit, US Navy Ship, and US Navy Aircraft, or Cooperating Unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data-rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system.

CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

The CEC Program Office oversees CEC development for all services with funding provided for their respective combat systems. CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and interface with Combat Systems and sensors. The DDS encodes and distributes own-ship sensor and engagement data and is a high capacity, jam resistant, directional system providing high data throughput as well common time and common positional frame of reference. The CEP is a high capacity distributed processor that processes data from all integrated radars. The data is passed to the ship's combat system as a high quality, common, continuous, engageable track.

The Navy implemented a Signal Data Processor (SDP) approach to modify the current equipment to meet reduced size, weight, cost, power and cooling objectives. This SDP approach also supports continuity for interoperability improvements and program protection, as well as supporting open architecture initiatives, and comms independence. The SDP hardware complies with Category 3 Open Architecture Computing Environment (OACE) standards. The SDP-S is being fielded fleet-wide to all US Navy, USMC, US Army, and FMS CEC units.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607658N *I (U)Cooperative Engagement Capability*

A family of antennas approach will be used to satisfy CEC requirements for obsolete components with lower life cycle costs (procurement, installation, and maintenance). These antennas enable future capability as well as providing a solution extensible to additional platforms. This effort for development and production of Common Array Block (CAB) antennas was competitively awarded in late FY2013.

Network Enabled Electronic Defense System (NEEDS) modifies CEC software to add significant Electronic Warfare capability.

CEC operates in increasingly contentious cyber-space. Measures are being taken to robustly mitigate, and where possible completely remediate cyber vulnerabilities.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	84.501	92.571	103.279	-	103.279
Current President's Budget	75.099	92.571	130.515	-	130.515
Total Adjustments	-9.402	0.000	27.236	-	27.236
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.902	0.000			
• Program Adjustments	0.000	0.000	28.887	-	28.887
• Rate/Misc Adjustments	0.000	0.000	-1.651	-	-1.651
• Congressional Directed Reductions Adjustments	-7.500	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / *(U)Cooperative Engagement Capability*	Project (Number/Name) 2039 / *COOP Engagement*	

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
2039: *COOP Engagement*	601.250	75.099	92.571	130.515	-	130.515	141.373	147.710	125.458	121.220	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 582

A. Mission Description and Budget Item Justification

Cooperative Engagement Capability (CEC) significantly improves Battle Force Anti-Air Warfare (AAW) capability by coordinating all Battle Force AAW sensors into a single, real-time, composite track picture to support integrated fire control.

CEC distributes sensor data from each USMC Command Control Unit, US Navy Ship, and US Navy Aircraft, or Cooperating Unit (CU), to all other CUs in the battle force through a real-time, line of sight, high data-rate sensor and engagement data distribution network. CEC is highly resistant to jamming and provides accurate gridlocking between CUs. Each CU independently employs high capacity, parallel processing and advanced algorithms to combine all distributed sensor data into a fire control quality track picture which is the same for all CUs. CEC data is presented as a superset of the best AAW sensor capabilities from each CU, all of which are integrated into a single input to each CU's combat weapons system.

CEC significantly improves our Battle Force defense in depth, including both local area and ship defense capabilities against current and future AAW threats. Moreover, CEC provides critical connectivity and integration of over-land air defense systems capable of countering emerging air threats, including land attack cruise missiles, in a complex littoral environment.

The CEC Program Office oversees CEC development for all services with funding provided for their respective combat systems. CEC consists of the Data Distribution System (DDS), the Cooperative Engagement Processor (CEP), and interface with Combat Systems and sensors. The DDS encodes and distributes own-ship sensor and engagement data and is a high capacity, jam resistant, directional system providing high data throughput as well common time and common positional frame of reference. The CEP is a high capacity distributed processor that processes data from all integrated radars. The data is passed to the ship's combat system as a high quality, common, continuous, engageable track.

The Navy implemented a Signal Data Processor (SDP) approach to modify the current equipment to meet reduced size, weight, cost, power and cooling objectives. This SDP approach also supports continuity for interoperability improvements and program protection, as well as supporting open architecture initiatives, and comms independence. The SDP hardware complies with Category 3 Open Architecture Computing Environment (OACE) standards. The SDP-S is being fielded fleet-wide to all US Navy, USMC, US Army, and FMS CEC units.

A family of antennas approach will be used to satisfy CEC requirements for obsolete components with lower life cycle costs (procurement, installation, and maintenance). These antennas enable future capability as well as providing a solution extensible to additional platforms. This effort for development and production of Common Array Block (CAB) antennas was competitively awarded in late FY2013.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

Network Enabled Electronic Defense System (NEEDS) modifies CEC software to add significant Electronic Warfare capability.

CEC operates in increasingly contentious cyber-space. Measures are being taken to robustly mitigate, and where possible completely remediate cyber vulnerabilities.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: E-2D	2.822	3.900	4.017	0.000	4.017
Articles:	-	-	-	-	-
FY 2018 Plans: Continue E-2D CEC Delta System Software Configuration version 3 (DSSC 3) systems engineering and development. DSSC 3 capability improvements include Accelerated Midterm Interoperability Improvement Project (AMIIP), Mode 5, Identification Friend or Foe (IFF) Modernization, Dynamic CEC Engagement Processor (CEP) Identification (ID), Naval Integrated Fire Control Counter Air (NIFC-CA) Increment 2, and Integrated Fire Control Improvement initiatives. Support related laboratory testing conducted in conjunction with the broader E-2D platform DSSC 3 software development. Analyze lab and flight test data and develop and implement fixes to high priority discrepancy reports. Complete E-2D DSSC 3 CEC Formal Qualification Testing. Begin E-2D DSSC 4/5 CEC requirements development and program execution planning.					
FY 2019 Base Plans: Complete E-2D DSSC 3 CEC Independent Verification and Validation Testing and the Product Certification Panel. Continue lab test data analysis and development and implementation of fixes to high priority discrepancy reports. Conduct software fleet release preparations. Begin E-2D DSSC 4 CEC development and integration to incorporate Dynamic CEP ID with Platform Registration and support interface and software changes related to select DSSC 4 capabilities driven by E-2D program requirements. Support E-2D DSSC 5 CEC development and integration efforts.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase is due to integration of DSSC-3 and follow-on initial development and integration for DSSC-4 and DSSC 5.					
Title: B/L 2.1 INTEGRATION AND FOT&E TESTING	8.100	11.000	11.330	0.000	11.330
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue CEC Developmental Test (DT-D2) of AN/USG-2B onboard USS GERALD R FORD (CVN 78). Conduct six underway test events onboard CVN 78 plus three live fire test events on Self Defense Test Ship (SDTS). Conduct three test events in preparation for Navy Integrated Fire Control - Counter Air (NIFC-CA) Live Fire Test #7 (the first NIFC-CA Increment 2 Live Fire Test). One test event planned at Wallops Island Land Based Test Site (LBTS) and two events planned at White Sands Missile Range (WSMR) Desert Ship. Conduct Combat System Shipboard Qualification Trials (CSSQT) onboard USS LEYTE GULF (CG 55) and USS SAN JACINTO (CG 56). Commence CEC Developmental Test (DT-D4) of CEC with ACB 16 (six tracking events at multiple LBTS of CEC with Aegis ACB 16). Continue support of NIFC-CA testing, including execution of At Sea test #4. Commence CEC Developmental Test (DT-D3) of AN/USG-2B with DDG 1000 combat system onboard SDTS (7 Live Fire and 9 Tracking) and onboard DDG 1000 (3 underway test events). Commence testing of Common Array Block (CAB) antenna systems for the USN and USMC antenna designs at the Raytheon Development Facility in preparation for testing at the Wallops Island Land Based test sites in 2019. Continue testing of Network Enabled Electronic Defense System (NEEDS) at LBTS in preparation for at-sea testing in FY2019. Commence testing of CEC Enhanced Training (CET) and CEC Tactical Training (CTT) at the Wallops Island Land Based Test Sites.					
FY 2019 Base Plans: Continue Developmental Testing (DT-D2) of AN/USG-2B with CVN 78. Complete remaining Live Fire and Trackex events on SDTS and six additional underway tests aboard CVN 78. Support E-2D Delta System Software Configuration Version 3 (DSSC-3) Developmental Testting (DT) completion. Support E-2D DSSC-3 Operational Testing (OT) preparation and execution. Conduct NIFC-CA Live Fire Test #7 at WSMR and two at-sea test events. Continue CEC Developmental Test (DT-D3) of AN/USG-2B with DDG 1000 combat system. Complete remaining live fire and tracking events onboard SDTS. Conduct first ever live fire test onboard DDG 1000. Continue CEC Developmental Test (DT-D4) of AN/USG-2B with Aegis ACB 16 at the Wallops Island Land Based Test Sites and at sea onboard USN Ships. Conduct CSSQT aboard USS OSCAR AUSTIN (DDG 79), USS HOWARD (DDG 83), USS COWPENS (CG 63), and USS GETTYSBURG (CG 64).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct testing of Common Array Block (CAB) antenna systems for the USN and USMC antenna designs at the Wallops Island Land Based Test Sites. Continue testing of NEEDS at LBTS and conduct testing onboard USN Ships. Continue testing of CET and CTT and commence CET and CTT testing onboard USN Ships. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to increase in scope of testing at LBTS and onboard ships/aircraft.					
Title: SYSTEM IMPROVEMENTS	13.899	25.971	18.786	0.000	18.786
Articles:	-	-	-	-	-
FY 2018 Plans: Develop integration and software updates to support AEGIS ACB 16 and conduct Product Release Panel (PRP) to support DDG and CG ACB 16 Modernization AEGIS Light Offs (ALO). Develop software to support AN/SPY-6(V)1 and AEGIS ACB 20 integration. Install CEC Adaptive Layer test equipment and conduct integration with AN/SPY-6(V)1 and AEGIS ACB 20 at the Aegis Combat System Engineering Development Site (CSEDS). Conduct Delta System Requirements Review (SRR) to address cyber requirements and System Functional Review (SFR) for AEGIS ACB 20. Develop and test SW Build Release #1 for AEGIS ACB 20. Develop and test SW Build Release #4 for further CEC system integration with Common Array Block (CAB) Family of Antenna (FoA). Continue development of software to support Dual Band Radar (DBR) and SSDS MK2 Mod 6C combat system integration for CVN 78 and conduct Product Certification Panel (PCP) for software delivery. Complete Software Development work for NIFC CA Increment 2 and complete Final Qualification Test (FQT) and transition to follow-on integration and testing phase in close coordination with other NIFC CA Platforms and Sensor, Weapons, and Combat Systems Program of Record (PoR). Complete Product Release Panel (PRP) of software to support testing at Land Based Test Sites, support Aegis light-off and participate in initial at-sea testing of NIFC CA Increment 2. The CEC Program will commence a cryptographic modernization effort for the Signal Data Processor (SDP) that is being developed to support the significant- increase-in cryptographic processor capability that is required to protect the CEC network. This modernization effort is required to support continued CEC system production as the current cryptographic equipment is no longer available for procurement due to obsolescence. This effort will					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
support cryptographic requirements definition, chip selection, purchase, and preliminary integration of the latest generation, NSA-certified cryptographic chip for use in the CEC system. ***FY 2019 Base Plans:*** Continue integration and software updates to support AEGIS ACB 16. Conduct PRP to support DDG and CG ACB 16 Modernization Combat System Ship Qualification and Trials (CSSQT) and PCP for software delivery to support ACB 16 Combat System Certification Panel (CSCP) in FY20. Continue software development for AN/SPY-6(V)1 and AEGIS ACB 20 integration. Develop and test SW Build Releases #2, #3, and #4 and conduct two SBRs for AEGIS ACB 20. Develop and test SW Build Release #5 for final CEC system integration with CAB FoA. Develop critical Product Trouble Report (PTR) fixes that are discovered from CVN 78 at-sea testing to support CEC integration with DBR and SSDS MK2 Mod 6C combat system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to the increase in complexity and software development and integration.					
Title: NETWORK ENABLED ELECTRONIC DEFENSE SYSTEM (NEEDS)	6.600	4.500	4.610	0.000	4.610
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct Test/Analyze/Fix cycles in support of NEEDS software integration. Commence certification testing of NEEDS software product at Land Based Test Sites (LBTS) and complete Product Release Panel (PRP) for initial fielding of NEEDS software in support of DDG and CG ACB 16 Modernization Aegis Light Off (ALO). ***FY 2019 Base Plans:*** Conduct Integration Verification and Validation at Raytheon Development Facility. Conduct government Independent Verification and Validation (IV&V) and Final Qualification Testing (FQT). Develop critical Product Trouble Report (PTR) fixes that are discovered during testing conducted at LBTS, onboard USN Ships, or during IV&V and FQT testing. Conduct Product Certification Panel (PCP) for software delivery to support ACB 16 Combat System Certification. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Increase is due to final qualification and certification.					
Title: FIELD ACTIVITIES	8.500	8.600	9.373	0.000	9.373
Articles:	-	-	-	-	-
FY 2018 Plans: Continue field activity support of CEC development and fielding efforts (including Software Engineering / Integration Agent (SE/IA), Technical Direction Agent, In-Service Engineering Agent, Integrated Logistics Support planning) and program management support. Facilitate fielding or systems improvements and maintenance efforts.					
FY 2019 Base Plans: Continue field activity support of CEC development and fielding efforts (including Software Engineering / Integration Agent (SE/IA), Technical Direction Agent, In-Service Engineering Agent, Integrated Logistics Support planning) and program management support. Facilitate fielding or systems improvements and maintenance efforts.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase is due to expected increase in level of field activity support.					
Title: COMMON ARRAY BLOCK (CAB) ANTENNA	10.200	16.300	9.649	0.000	9.649
Articles:	-	-	-	-	-
FY 2018 Plans: Continue CAB Family of Antenna (FoA) Engineering Development Model (EDM) fabrication and deliver EDM hardware. Perform EDM component level Design Verification Testing (DVT), Integration and Test (I&T) for the CAB-S Array Functional Verification Testing (FVT). Perform EDM system level DVT, I&T, and FVT. Prepare for and conduct Pre-Production Readiness Review (PPRR), and commence material procurement and perform fabrication of CAB-S and CAB-E Pre-Production Units (PPU). Develop, code, and unit test CAB software Build 4. Complete below-deck Antenna Power Supply Unit (APSU) build and test. Complete CAB-S and CAB-E Installation Design Packages, and address platform customer CAB installation design issues/questions.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Build and test CAB FoA Pre-production Units (PPU). Develop, code, and unit test CAB software Build 5. Perform qualification testing on PPUs. Develop and deliver CAB Interactive Electronic Technical Manuals, Corrective Maintenance Exercises, and Product Structure Engineering Change Proposals. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease is due to CAB development and integration finalizing in FY19.					
Title: AIR AND MISSILE DEFENSE RADAR (AMDR) ***Articles:*** ***FY 2018 Plans:*** Note: AMDR moved to the System Improvements line ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A	5.296 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: NAVAL INTEGRATED FIRE CONTROL-COUNTER AIR (NIFC-CA) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Complete Software Integration of NIFC-CA Increment 2. Conduct Product Certification Panel (PCP) in support of final delivery of NIFC-CA Increment 2. Support Land Based Test Site and At Sea Developmental Testing (DT) of NIFC-CA Increment 2. Conduct analysis of Land Based Test Site and at-sea test data in support of future NIFC capabilities. Continue requirements development for NIFC-CA Increment 3. ***FY 2019 OCO Plans:***	5.700 -	0.000 -	6.871 -	0.000 -	6.871 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

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:*** Note: The work for NIFC-CA in FY 2018 was under system improvements and now in FY 2019 on it's own line.					
Title: FIRE CONTROL LOOP IMPROVEMENT INITIATIVE (FCLIP) PHASE 2	9.400	8.400	8.700	0.000	8.700
Articles:	-	-	-	-	-
FY 2018 Plans: Continue Agile software design, coding, and integration with the Ship Self Defense System (SSDS) Combat System, Close In Weapon System (CIWS) sensor (single and dual mounts), and Mk-9 Multi-Target Tracking (MTT) sensors. Develop and provide software releases supporting field testing at land based test sites (LBTS) and ship's combat system activation. Conduct tracking test events with live aircraft and accompanying CEC units to validate sensor integration, composite tracking and interoperability. ***FY 2019 Base Plans:*** Develop Software Build Release (SBR) and complete CIWS FY18 dual mount, MK-9 MTT testing and data analysis. Conduct Engineering Verification Tests (EVT) and Product Release Panels (PRP) to support Combat System Lite Off (CSLO) and testing on SSDS ships. Conduct CEC Final Qualification Test (FQT) prior to software delivery to the government. Conduct government Independent Verification and Validation testing and Product Certification Panel (PCP) for software delivery to support Combat System Certification Panel. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to final software integration, qualification and product certification.					
Title: PROGRAM PROTECTION	4.345	8.400	8.527	0.000	8.527
Articles:	-	-	-	-	-
FY 2018 Plans: Provide CEC Program Protection support to manage risks from foreign intelligence collection threats to CEC hardware, software, or supply chain exploitation. The CEC DoD unique or critical technologies are required to be protected using threat resist ant anti-tamper technologies. The effort will further the use of the threat resistant					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
anti-tamper technologies within the program. CEC will work closely with the Cyber Assessment Agency and Defense Assessment Management Office to access impacts to the program from exploitation. ***FY 2019 Base Plans:*** Provide CEC Program Protection support to manage risks from foreign intelligence collection threats to CEC hardware, software, or supply chain exploitation. The CEC DoD unique or critical technologies are required to be protected using threat resistant anti-tamper technologies. The effort will further the use of the threat resistant anti-tamper technologies within the program. CEC will work closely with the Cyber Assessment Agency and Defense Assessment Management Office to access impacts to the program from exploitation. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease is due to reduction in funding availability.					
Title: CEC INCREMENT 2	0.237	2.100	3.300	0.000	3.300
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct surface sensor integration to support Fire Control Loop Improvement Project (FCLIP) Ph. 2 software development. Begin development of advanced CEC kernel functions to provide surface tracking specific environmental filters. Conduct an at-sea demonstration of Automated Battle Management Aid (ABMA) prototype tactical software with the ONR and NRL teams. ***FY 2019 Base Plans:*** Continue development of advanced CEC kernel functions to provide surface tracking specific environmental filters. Continue development of prototype tactical software for a 2020 demonstration of ABMA (electronic warfare coordination, and sensors and weapons coordination).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

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 evolve the system of systems architecture concepts while partnering with ONR and NRL and testing software in a land-based test site environment. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to increase in complexity of software development and integration.					
Title: ENTERPRISE AIR SURVEILLANCE RADAR (EASR)	0.000	3.400	6.900	0.000	6.900
Articles:	-	-	-	-	-
FY 2018 Plans: Develop EASR Interface Requirements Specification (IRS), Interface Description Document (IDD) and Interface Description Language (IDL) with IWS 2 and 10. Support EASR program System Engineering Technical Review (SETR) Software Build Reviews (SBR) and Agile Sprint reviews. Begin initial development for CEC adaptive layers for the Rotator and Fixed Array variants of EASR for CVN and L-Class ships. Commence integration test with the EASR Simulator. Conduct requirements identification for the integration of the Enterprise Radar Suite (ERS), including Next Generation Surface Search Radar (NGSSR) Systems Requirements Review (SRR), System Functional Review (SFR) and Initial Design Review (IDR) and Ship Self Defense System (SSDS) ACB-20 SRR and SFR. ***FY 2019 Base Plans:*** Continue technical documentation analysis of EASR, NGSSR and SSDS ACB-20 combat system in support of SETR milestones and Agile software development Sprint reviews. Continue CEC requirements capture, architecture design and software development for the CEC adaptive layers for Rotator and Fixed variants of EASR, NGSSR and SSDS ACB-20 combat system for CVN and L-Class ships. Continue integration testing with the EASR Simulator and commence integration testing with the EASR Emulator. Conduct two CEC-EASR-SSDS Software Build Reviews (SBRs).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Commence Combat System Integration testing with the SSDS ACB-20 baseline and EASR variant 1 at the Wallops Island Land Based Test Site (LBTS). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is due to the increase in complexity and software development.					
Title: CEC FAR-TERM INTEROPERABILITY IMPROVEMENT PROJECT (FTIIP) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Commence development of CEC integration with Identification Friend of Foe (IFF) Mode S and Automatic Dependent Surveillance - Broadcast (ADS-B) systems. Coordinate system and subsystem requirements and integration with Aegis, Ship Self Defense System (SSDS), and E-2D Advanced Hawkeye Programs. Conduct System Requirements Review (SRR) and System Functional Review (SFR). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Commence development and integration for FTIIP.	0.000 -	0.000 -	6.500 -	0.000 -	6.500 -
Title: DIGITAL WARFARE TACTICAL NETWORKING INITIATIVE IMPLEMENTATION ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Lead a cross functional team (CFT) with participation from key naval tactical network organizations and fleet representation to conduct initial systems engineering and experimentation for improving tactical data dissemination to support further development of Integrated Fire Control concepts. This includes investigation of Communications-As-A-Service (CAAS) implementation across multiple radios, waveforms, and network	0.000 -	0.000 -	17.900 -	0.000 -	17.900 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
architectures; and early Software-in-the-Loop (SIL) and Land Base Test Site (LBTS) experimentation to formulate the solution toward the development of Fleet Tactical Grid and Distributed Maritime Operations. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Commence early software development and integration.					
Title: CEC CYBER RESILIENCY ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Design and implement mitigation and remediation of known HIGH risk vulnerabilities. Incorporate specific CEC system hardware and software changes identified via the cyber accreditation process as well as required Information Assurance Vulnerability Management (IAVM) updates into incremental CEC system software builds. Address and retire interface issues between CEC and the host Combat System for AEGIS ACB16, AEGIS ACB 20, and Ship Self Defense System (SSDS) ACB 20 surface ships as well as Land Based and Airborne platforms. Conduct Final Qualification and Verification and Validation testing events of the CEC system baselines with hardware and software changes addressing cyber High-risk issues. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Commence design and implementation to enhance CEC cyber security posture.	0.000 -	0.000 -	9.500 -	0.000 -	9.500 -
Title: CRYPTO MODERNIZATION ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** The CEC Program will continue a cryptographic modernization effort for the SDP that is being developed to support the significant- increase-in cryptographic processor capability that is required to protect the CEC	0.000 -	0.000 -	4.552 -	0.000 -	4.552 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
network. This effort will continue cryptographic requirements definition, complete integration, performance and environmental testing, security verification testing, and NSA certification of the latest generation, NSA-certified cryptographic chip for use in the CEC system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Note: Crypto Mod. was under system improvements in FY 2018 and in FY 2019 it moved to it's own line.					
Accomplishments/Planned Programs Subtotals	75.099	92.571	130.515	0.000	130.515

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: *Navy, SCN*	25.500	19.200	28.400	-	28.400	12.500	12.700	12.800	12.800	38.400	510.431
• APN/0204152N: *Navy, APN*	19.886	16.897	13.788	-	13.788	14.064	14.345	14.632	14.925	15.223	373.992
• OPN/2606: *CEC*	17.965	23.892	44.173	-	44.173	32.132	31.827	32.419	33.127	31.641	1,062.952
• RDT&E/0206313M: *USMC*	141.171	123.825	174.779	16.130	190.909	148.367	104.147	99.277	110.231	Continuing	Continuing
• O&M,N/0206626M: *USMC*	2.291	3.157	3.062	-	3.062	2.970	2.881	2.881	0.000	0.000	28.022
• PMC/0206313M: *USMC*	1.164	8.390	8.070	-	8.070	3.550	0.000	0.000	0.000	0.000	24.558
• 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

CEC Acquisition Strategy (AS) approved by OSD (AT&L) on 19 January 2010. CEC Acquisition Plan (AP) approved September 2013. Full Rate Production for CEC AN/USG-3B variant approved April 2014.

Contracts:
Common Array Block (CAB) antenna - contract competitively awarded 4Qtr FY2013.
CEC Design Agent/Engineering Services (DA/ES) follow-on sole source contract awarded 4Qtr FY2013.
CEC Production - Contract competitively awarded in 2Qtr FY2015.
CEC DA/ES contract will be competitively awarded 1Qtr FY2019. For DA, The contractor will maintain the CEC hardware and software development environment and testing infrastructure including; Systems and Software Laboratories, the external RF Range, the Compact Antenna Range, and the CEC Classified Development LAN.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

For ES, the contractor will provide analysis, design, implementation, integration, testing and evaluation, reliability and maintainability, quality assurance, safety, security, Integrated Logistics Support (ILS), and Configuration Management (CM).

E. Performance Metrics

- Complete the adaptive layer development for the E-2D aircraft. Provide technical support for installation and integration in the Northrop Grumman Systems Integration Laboratory, on board the test aircraft and support the Developmental testing. Continue E-2D Advanced Hawkeye aircraft CEC integration efforts.
- Continue AEGIS Advance Capability Builds CEC integration and demonstration efforts.
- Continue Naval Integrated Fire Control - Counter Air (NIFC-CA) CEC integration and demonstration efforts.
- Continue Crypto Modernization Tech Refresh efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / *(U)Cooperative Engagement Capability*	Project (Number/Name) 2039 / *COOP Engagement*	

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/USG-2/3 Design Agent/Engineering Services	C/CPFF	Raytheon : St. Petersburg, FL	127.395	9.066	Jan 2017	13.328	Oct 2017	10.579	Oct 2018	-		10.579	Continuing	Continuing	Continuing
TDA	C/CPFF	JHU/APL : Laurel, MD	78.150	8.735	Feb 2017	13.176	Oct 2017	10.157	Oct 2018	-		10.157	Continuing	Continuing	Continuing
SI/DA	C/CPAF	General Dynamics : Fairfax, VA	23.979	0.000		0.000		0.000		-		0.000	0.000	23.979	-
SI/DA	C/CPAF	Award Fees : Not Specified	2.903	0.000		0.000		0.000		-		0.000	0.000	2.903	-
DDG 1000	C/CPAF	Raytheon : Massachusetts	10.983	0.000		0.000		0.000		-		0.000	0.000	10.983	-
DDG 1000	C/CPAF	Award Fees : Not Specified	0.447	0.000		0.000		0.000		-		0.000	0.000	0.447	-
NIFC-CA Integration	Various	Various : Various	41.799	5.700	Jan 2017	0.000	Oct 2017	6.871	Oct 2018	-		6.871	Continuing	Continuing	Continuing
In-Service Engineering Activity	WR	NSWC : Port Hueneme, CA	6.463	1.625	Dec 2016	3.305	Oct 2017	2.922	Oct 2018	-		2.922	Continuing	Continuing	Continuing
Software Support Activity/ SEIA	WR	NSWC : Dahlgren, VA	19.718	1.715	Dec 2016	3.367	Oct 2017	2.978	Oct 2018	-		2.978	Continuing	Continuing	Continuing
Production Engineering Activity	WR	NSWC : Crane, IN	5.694	0.258	Dec 2016	0.395	Oct 2017	0.523	Oct 2018	-		0.523	0.000	6.870	-
JTRS	Various	Various : Various	8.500	0.000		0.000		0.000		-		0.000	0.000	8.500	-
Various	WR	Various : Various	31.873	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
NAVSSI	WR	SPAWAR : San Diego, CA	0.368	0.000		0.000		0.000		-		0.000	0.000	0.368	-
Certification	MIPR	NSA : Fort Meade, MD	1.200	0.000		0.000		0.000		-		0.000	0.000	1.200	-
Certification	WR	SPAWAR : Charleston, SC	0.930	0.000		0.000		0.000		-		0.000	0.000	0.930	-
Joint Exercises	WR	Various : Various	3.744	0.000		0.000		0.000		-		0.000	0.000	3.744	-
LBTS Testing	WR	CDSA Dam Neck : Virginia Beach, VA	7.495	0.500	Dec 2016	0.500	Oct 2017	0.500	Oct 2018	-		0.500	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / *(U)Cooperative Engagement Capability*	Project (Number/Name) 2039 / *COOP Engagement*	

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
LBTS Testing	WR	SCSC : Wallops Island, VA	7.083	0.500	Jan 2017	0.500	Oct 2017	0.500	Oct 2018	-		0.500	Continuing	Continuing	Continuing
E-2D Integration	Various	Various : Various	47.758	2.822	Feb 2017	3.900	Oct 2017	4.017	Oct 2018	-		4.017	Continuing	Continuing	Continuing
MSI/NCCT	MIPR	Wright Patterson AFB : Dayton, OH	1.228	0.000		0.000		0.000		-		0.000	0.000	1.228	-
Common Array Block Development	C/CPFF	Raytheon : St. Petersburg, FL	40.561	10.200	Jan 2017	16.300	Oct 2017	9.649	Oct 2018	-		9.649	Continuing	Continuing	Continuing
NEEDS	Various	Various : Various	31.930	6.600	Feb 2017	4.500	Oct 2017	4.610	Oct 2018	-		4.610	Continuing	Continuing	Continuing
AMDR	Various	Various : Various	12.012	5.296	Feb 2017	0.000	Oct 2017	0.000	Oct 2018	-		0.000	Continuing	Continuing	Continuing
JTMC	C/CPFF	Raytheon : St. Petersburg, FL	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	-
FCLIP	Various	Various : Various	7.100	9.400	Feb 2017	8.400	Oct 2017	8.700	Oct 2018	-		8.700	Continuing	Continuing	Continuing
CEC Increment 2	Various	Various : Various	0.000	0.237	Feb 2017	2.100	Oct 2017	3.300	Oct 2018	-		3.300	Continuing	Continuing	Continuing
Program Protection	C/BA	NSMA : Washington, DC	0.000	4.345	Feb 2017	8.400	Oct 2017	8.527	Oct 2018	-		8.527	Continuing	Continuing	Continuing
EASR	Various	Various : Various	0.000	0.000		3.400	Oct 2017	6.900	Oct 2018	-		6.900	0.000	10.300	-
Crypto Modernization	Various	Various : Various	0.000	0.000		0.000	Oct 2017	4.552	Oct 2018	-		4.552	0.000	4.552	-
Digital Warfare Office (DWO)	Various	Various : Various	0.000	0.000		0.000		17.900	Oct 2018	-		17.900	0.000	17.900	-
FTIIP	Various	Various : Various	0.000	0.000		0.000		6.500	Oct 2018	-		6.500	0.000	6.500	-
Cyber Resiliency	Various	Various : Various	0.000	0.000		0.000		9.500	Oct 2018	-		9.500	0.000	9.500	-
		Subtotal	520.313	66.999		81.571		119.185		-		119.185	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/ACB Support	C/CPFF	Raytheon : St. Petersburg, FL	5.114	1.013	Feb 2017	1.308	Oct 2017	1.379	Oct 2018	-		1.379	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

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/ACB Support	C/CPFF	JHU/APL : Laurel, MD	2.676	1.058	Feb 2017	1.816	Oct 2017	1.835	Oct 2018	-		1.835	Continuing	Continuing	Continuing
Test Support	WR	NRL : Washington, DC	0.313	0.000		0.000		0.000		-		0.000	0.000	0.313	-
Test/ACB Support	WR	NSWC : Port Hueneme, CA	24.386	1.395	Feb 2017	2.147	Oct 2017	2.163	Oct 2018	-		2.163	Continuing	Continuing	Continuing
Air Operations Test Support	WR	NAVAIR (PMA207) : Patuxent River, MD	10.187	1.047	Feb 2017	1.231	Oct 2017	1.247	Oct 2018	-		1.247	Continuing	Continuing	Continuing
Test Data Reduction Analysis	WR	NSWC : Corona, CA	17.934	1.234	Feb 2017	1.541	Oct 2017	1.641	Oct 2018	-		1.641	Continuing	Continuing	Continuing
Test Support	WR	COMOPTEVFOR : Norfolk, VA	12.607	1.075	Feb 2017	1.369	Oct 2017	1.452	Oct 2018	-		1.452	Continuing	Continuing	Continuing
Test/ACB Support	WR	NSWC : Dahlgren, VA	2.290	1.278	Feb 2017	1.588	Oct 2017	1.613	Oct 2018	-		1.613	Continuing	Continuing	Continuing
		Subtotal	75.507	8.100		11.000		11.330		-		11.330	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/FFP	Booz Allen & Hamilton : Washington, DC	5.070	0.000		0.000		0.000		-		0.000	0.000	5.070	-
Program Management Support	C/FFP	Tech Marine : Washington, DC	0.360	0.000		0.000		0.000		-		0.000	0.000	0.360	-
		Subtotal	5.430	0.000		0.000		0.000		-		0.000	0.000	5.430	N/A

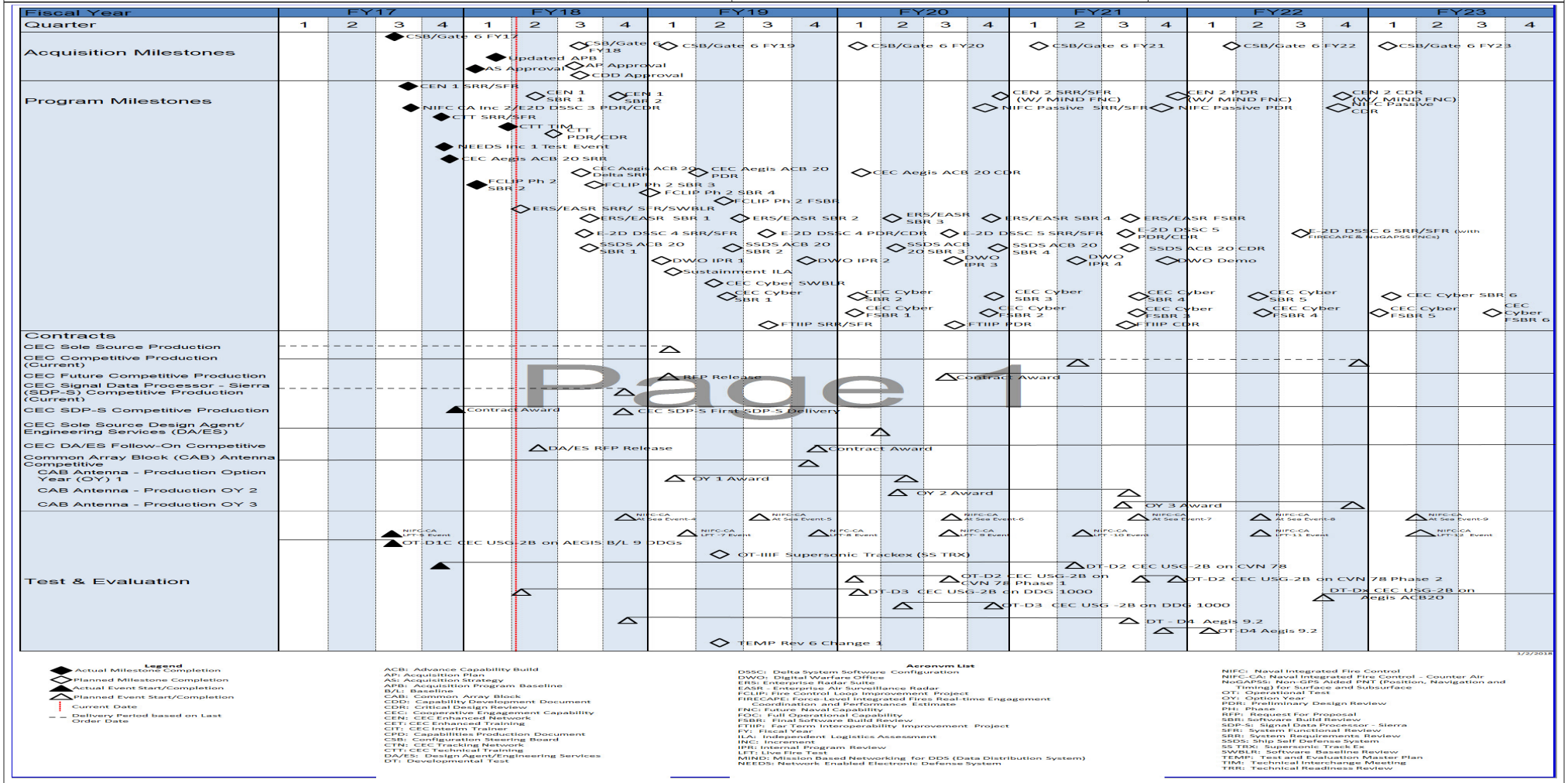
	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	601.250	75.099		92.571		130.515		-		130.515	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607658N / *(U)Cooperative Engagement Capability*	Project (Number/Name) 2039 / *COOP Engagement*	

	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 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*



Page 1

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2039				
CSB/Gate 6 FY17	3	2017	3	2017
CSB/Gate 6 FY18	1	2018	1	2018
CSB/Gate 6 FY19	1	2019	1	2019
CSB/Gate 6 FY20	1	2020	1	2020
CSB/Gate 6 FY21	1	2021	1	2021
CSB/Gate 6 FY22	1	2022	1	2022
CSB/Gate 6 FY23	1	2023	1	2023
Updated APB	4	2017	4	2017
CEN 1 SRR/SFR	3	2017	3	2017
CEN 1 SBR 1	1	2018	1	2018
CEN 1 SBR 2	4	2018	4	2018
CEN 2 SRR/SFR (w/MIND FNC)	4	2020	4	2020
CEN 2 PDR (w/MIND FNC)	4	2021	1	2022
CEN 2 CDR (w/MIND FNC)	4	2022	4	2022
NIFC-CA INC 2/E2D DSSC 3 PDR/CDR	3	2017	3	2017
NIFC Passive SRR/SFR	4	2020	4	2020
NIFC Passive PDR	4	2021	4	2021
NIFC Passive CDR	4	2022	4	2022
NEEDS Inc 1 Test Event	4	2017	4	2017
CEC Aegis ACB 20 SRR	4	2017	4	2017
CEC Aegis ACB 20 SFR/Delta SRR	3	2018	3	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CEC Aegis ACB 20 PDR	2	2019	2	2019
CEC Aegis ACB 20 CDR	1	2020	1	2020
ERS/EASR SRR/SFR/SWBLR	2	2018	2	2018
ERS/EASR SBR 1	3	2018	3	2018
ERS/EASR SBR 2	2	2019	2	2019
ERS/EASR SBR 3	2	2020	2	2020
ERS/EASR SBR 4	4	2020	4	2020
ERS/EASR FSBR	3	2021	3	2021
FCLIP PH2 SBR 2	1	2018	1	2018
FCLIP PH2 SBR 3	3	2018	3	2018
FCLIP PH2 SBR 4	4	2018	4	2018
FLIP PH2 FSBR	2	2019	2	2019
CTT SRR/SFR	4	2017	4	2017
E-2D DSSC 4 SRR/SFR	3	2018	3	2018
E-2D DSSC 4 PDR/CDR	3	2019	3	2019
E-2D DSSC 5 SRR/SFR	3	2020	3	2020
E-2D DSSC 5 PDR/CDR	3	2021	3	2021
E-2D DSSC 6 SRR/SFR (w/FIRECAPE & NoGAPSS FNCs)	3	2022	3	2022
SSDS ACB 20 SBR 1	3	2018	3	2018
SSDS ACB 20 SBR 2	2	2019	2	2019
SSDS ACB 20 SBR 3	2	2020	2	2020
SSDS ACB 20 SBR 4	4	2020	4	2020
SSDS ACB 20 CDR	3	2021	3	2021
SUSTAINMENT ILA	1	2019	1	2019
CEC CYBER SWBLR	2	2019	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CEC CYBER SBR 1	2	2019	2	2019
CEC CYBER SBR 2	1	2020	1	2020
CEC CYBER SBR 3	4	2020	4	2020
CEC CYBER SBR 4	3	2021	3	2021
CEC CYBER SBR 5	2	2022	2	2022
CEC CYBER SBR 6	1	2023	1	2023
CEC CYBER FSBR 1	1	2020	1	2020
CEC CYBER FSBR 2	4	2020	4	2020
CEC CYBER FSBR 3	3	2021	3	2021
CEC CYBER FSBR 4	2	2022	2	2022
CEC CYBER FSBR 5	1	2023	1	2023
CEC CYBER FSBR 6	3	2023	3	2023
FTIIP SRR/SFR	3	2019	3	2019
FTIIP PDR	3	2020	3	2020
FTIIP CDR	3	2021	3	2021
CEC SOLE SOURCE PRODUCTION	1	2017	1	2019
CEC COMPETITIVE PRODUCTION (CURRENT)	1	2017	4	2022
RFP RELEASE CEC FUTURE COMPETITIVE PRODUCTION	1	2019	1	2019
CEC FUTURE COMPETITIVE PRODUCTION	3	2020	4	2023
CEC SDP-S COMPETITIVE PRODUCTION (CURRENT)	1	2017	4	2018
CEC SDP-S COMPETITIVE PRODUCTION	4	2017	1	2023
CEC SDP-S FIRST SDP-S DELIVERY	4	2018	4	2018
CEC SOLE SOURCE DA/ES	1	2017	1	2020
DA/ES RFP RELEASE	1	2018	1	2018
CEC DA/ES FOLLOW-ON COMPETITIVE	4	2019	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CAB ANTENNA COMPETITIVE	1	2017	4	2022
NIFC-CA AT SEA EVENT 4	4	2018	4	2018
NIFC-CA AT SEA EVENT 5	3	2019	3	2019
NIFC-CA AT SEA EVENT 6	3	2020	3	2020
NIFC-CA AT SEA EVENT 7	3	2021	3	2021
NIFC-CA AT SEA EVENT 8	2	2022	2	2022
NIFC-CA AT SEA EVENT 9	1	2023	1	2023
NIFC-CA LFT 5 EVENT	3	2017	3	2017
NIFC-CA LFT 7 EVENT	1	2019	1	2019
NIFC-CA LFT 8 EVENT	4	2019	4	2019
NIFC-CA LFT 9 EVENT	3	2020	3	2020
NIFC-CA LFT 10 EVENT	2	2021	2	2021
NIFC-CA LFT 11 EVENT	2	2022	2	2022
NIFC-CA LFT 12 EVENT	2	2023	2	2023
OT-D1C CEC USG-2B ON AEGIS B/L 9 DDGs	1	2017	3	2017
OT-IIIF SUPERSONIC TRACKEX (SS TRX)	2	2019	2	2019
DT-D2 CEC USG-2B ON CVN 78	4	2017	2	2021
OT-D2 CEC USG-2B ON CVN 78 PHASE 1	1	2020	3	2020
OT-D2 CEC USG-2B ON CVN 78 PHASE 2	3	2021	4	2021
TEMP REV 6 CHG 1	2	2019	2	2019
DT-D3 CEC USG-2B ON DDG 1000	2	2018	1	2020
OT-D3 USG-2B ON DDG 1000	2	2020	4	2020
DT-D4 AEGIS 9.2	4	2018	3	2021
OT-D4 AEGIS 9.2	4	2021	1	2022
AS Approved	1	2018	1	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607658N / *(U)Cooperative Engagement Capability*	**Project (Number/Name)** 2039 / *COOP Engagement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AP Approved	3	2018	3	2018
CDD Approval	3	2018	3	2018
CTT TIM	1	2018	1	2018
CTT PDR/CDR	2	2018	2	2018
DWO IPR 1	1	2019	1	2019
DWO IPR 2	4	2019	4	2019
DWO IPR 3	3	2020	3	2020
DWO IPR 4	2	2021	2	2021
DWO Demo	4	2021	4	2021
DT-Dx CEC USG-2B on Aegis ACB 20	4	2022	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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607700N *I (U)Deployable Joint Command and 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	0.000	2.935	3.137	3.127	-	3.127	3.161	3.229	3.296	3.371	Continuing	Continuing
3050: *Deployable JT Command and Control*	0.000	2.935	3.137	3.127	-	3.127	3.161	3.229	3.296	3.371	Continuing	Continuing

A. Mission Description and Budget Item Justification

Deployable Joint Command and Control (DJC2) provides a self-contained, standardized, rapidly deployable, modular, scalable, and reconfigurable joint command and control (C2) capability to designated Geographic Combatant Commands (GCCs). DJC2 is the materiel solution to Defense Planning Guidance that called for the development of standing Joint Task Forces (JTFs) with a deployable C2 capability. DJC2 will ensure that Joint Force Commanders (JFC) are equipped, as well as trained and organized, to carry out their C2 responsibilities. DJC2 provides GCCs and JFCs a mission critical, integrated family of systems with which to plan, control, coordinate, execute, and assess operations. It is designed to deploy rapidly, set up within hours, and quickly provide necessary C2 mission and collaboration functionality across the full spectrum of JTF operations. The DJC2 has also been deployed in support of Humanitarian Assistance and Disaster Relief (HA/DR) efforts. The capability is intended for all levels of conflict and will be reconfigurable to meet specific GCC and JTF mission requirements. This capability is interoperable with higher and adjacent echelons of command (to include coalition allies) as well as with supporting elements to include joint forces.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	2.970	3.137	3.221	-	3.221
Current President's Budget	2.935	3.137	3.127	-	3.127
Total Adjustments	-0.035	0.000	-0.094	-	-0.094
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.035	0.000			
• Program Adjustments	0.000	0.000	-0.018	-	-0.018
• Rate/Misc Adjustments	0.000	0.000	-0.076	-	-0.076

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607700N / *(U)Deployable Joint Command and Control*	Project (Number/Name) 3050 / *Deployable JT Command and 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
3050: *Deployable JT Command and Control*	0.000	2.935	3.137	3.127	-	3.127	3.161	3.229	3.296	3.371	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Deployable Joint Command and Control (DJC2) provides a self-contained, standardized, rapidly deployable, modular, scalable, and reconfigurable joint command and control (C2) capability to designated Geographic Combatant Commands (GCCs). DJC2 is the materiel solution to Defense Planning Guidance that called for the development of standing Joint Task Forces (JTFs) with a deployable C2 capability. DJC2 will ensure that Joint Force Commanders (JFC) are equipped, as well as trained and organized, to carry out their C2 responsibilities. DJC2 provides GCCs and JFCs a mission critical, integrated family of systems with which to plan, control, coordinate, execute, and assess operations. It is designed to deploy rapidly, set up within hours, and quickly provide necessary C2 mission and collaboration functionality across the full spectrum of JTF operations. The DJC2 has also been deployed in support of Humanitarian Assistance and Disaster Relief (HA/DR) efforts. The capability is intended for all levels of conflict and will be reconfigurable to meet specific GCC and JTF mission requirements. This capability is interoperable with higher and adjacent echelons of command (to include coalition allies) as well as with supporting elements to include joint forces. Note that DJC2 is not a follow-on or replacement system for the Joint Global Command and Control Systems (GCCS-J); rather, DJC2 employs a GCCS in its suite of applications, ensuring interoperability with the worldwide-installed base of GCCS-J.

FY19 funding supports development of efforts for systems engineering, integration, and DJC2 Test Bed. Focus areas include development efforts of emerging cyber security 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: Systems Engineering & Integration	1.242	1.330	1.398	0.000	1.398
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to develop system enhancements in support of Defense Information Systems Agency's Joint Information Environment (JIE) Tactical Processing Node(TPN) and Common Expeditionary and Shore Baseline (CESB) Enhancement as well as continue migration to a common infrastructure and C2ISR application baseline.					
FY 2019 Base Plans: Continue to develop system enhancements in support of Information Assurance, Assured Command & Control, Common Expeditionary and Shore Baseline (CESB) Enhancement / migration to a common infrastructure					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607700N / *(U)Deployable Joint Command and Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
and C2ISR application baseline. Align common system architecture with Joint Information Environment (JIE) and Tactical Packet Network (TPN) supporting leverage of common capabilities. Initiate enclave consolidation leveraging data tagging and tagged authorization and authentication for enclave access. Enhance satellite communication Unified Net centric System Modernizing Teleport Step Sites and disconnected, intermittent and latent available cloud capabilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 increase reflects procurement efficiency and inflation rate adjustments.					
Title: DJC2 RDT&E Test Bed	1.693	1.807	1.729	0.000	1.729
Articles:	-	-	-	-	-
FY 2018 Plans: Test and demonstrate interoperability / Mission Partner Environment (MPE), system virtualization, episodic enclave, and enhanced Information Assurance capabilities. Continue to use DJC2 test bed for software testing and development of new capabilities. ***FY 2019 Base Plans:*** Continue testing in support of enhanced Information Assurance to include Automated Cyber Security testing, automated system vulnerability patching download, and system microsegmentation. Demonstrate Cloud Service Automated Patching/Cloud services and Commercial Solution for Classified Multi-Tenant Environment Replacing Type 1 Encryption. Refine and test Disconnected, Interrupted, and Low-bandwidth (DIL) tolerant access to support automated system patching, as-needed remote system access, automated system download from in-garrison cloud, and re-synch with cloud after deployment. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease reflects economic assumptions - purchase and other inflation rate adjustments.					
Accomplishments/Planned Programs Subtotals	2.935	3.137	3.127	0.000	3.127

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607700N / *(U)Deployable Joint Command and Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

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: *DJC2*	1.414	2.973	2.256	-	2.256	1.986	2.408	2.161	2.204	Continuing	Continuing

Remarks

D. Acquisition Strategy

This RDT&E line supports an evolutionary acquisition strategy. The intent of this strategy is to: develop a system based upon a current understanding of joint requirements; rapidly field systems based upon those requirements; analyze operational utilization of the systems; and roll the results of the analysis into periodic upgrades of the systems to maintain currency and maximize operational effectiveness. The baseline configuration is based upon existing Command, Control, Communications, Computers, & Intelligence (C4I) systems, scaled to the Combatant Command level. The follow-on configurations will include newly developed capabilities based on emergent, joint requirements and operational feedback based upon utilization of earlier delivered systems.

E. Performance Metrics

The Deployable Joint Command and Control (DJC2) program continues to identify, evaluate and test a minimum of 3 - 5 new technologies per year based on emergent / joint requirements for potential insertion into the DJC2 system upgrade plan.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607700N / *(U)Deployable Joint Command and Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*	

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 : PCD	0.000	0.707	Dec 2016	0.727	Dec 2017	0.734	Dec 2018	-		0.734	Continuing	Continuing	Continuing
		Subtotal	0.000	0.707		0.727		0.734		-		0.734	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 Integration	WR	NSWC : PCD	0.000	0.347	Dec 2016	0.404	Dec 2017	0.404	Dec 2018	-		0.404	Continuing	Continuing	Continuing
		Subtotal	0.000	0.347		0.404		0.404		-		0.404	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 : PCD	0.000	0.813	Dec 2016	0.898	Dec 2017	0.885	Dec 2018	-		0.885	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	NSWC : PCD	0.000	0.880	Dec 2016	0.920	Dec 2017	0.934	Dec 2018	-		0.934	Continuing	Continuing	Continuing
		Subtotal	0.000	1.693		1.818		1.819		-		1.819	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	NSWC : PCD	0.000	0.188	Dec 2016	0.188	Dec 2017	0.170	Dec 2018	-		0.170	Continuing	Continuing	Continuing
		Subtotal	0.000	0.188		0.188		0.170		-		0.170	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0607700N / *(U)Deployable Joint Command and Control*	Project (Number/Name) 3050 / *Deployable JT Command and Control*	

	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	2.935		3.137		3.127		-		3.127	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607700N / *(U)Deployable Joint Command and Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

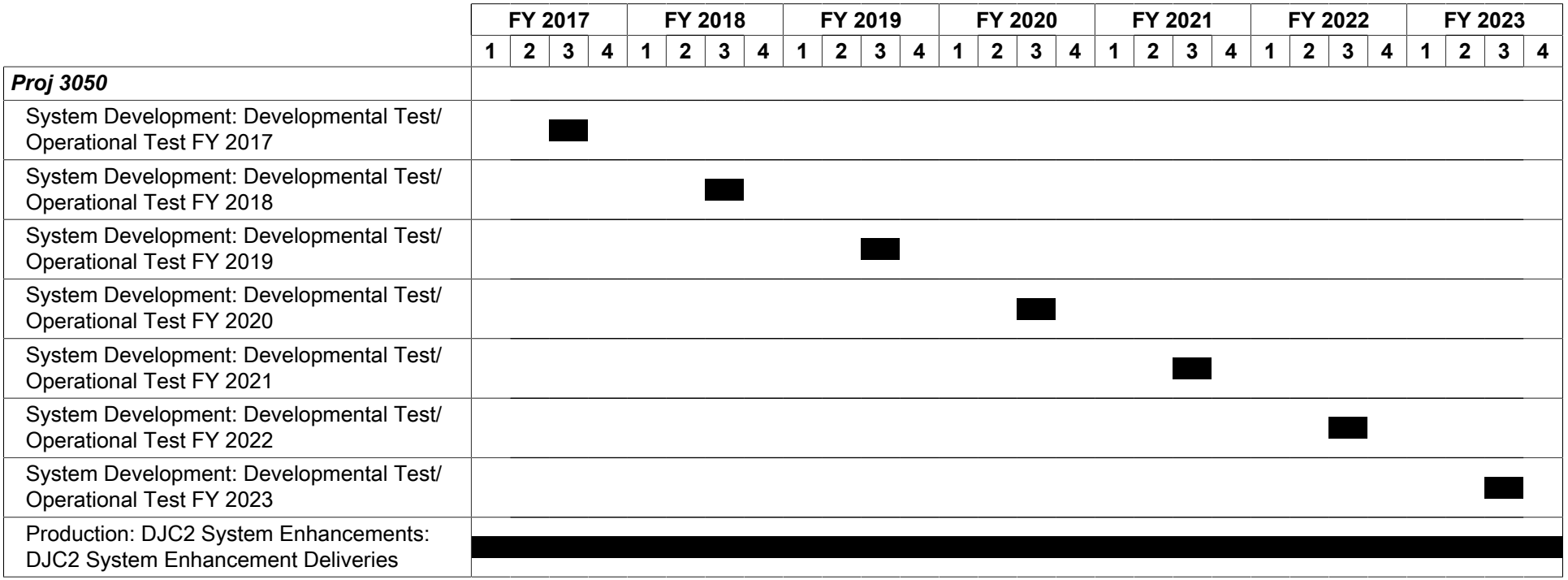


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0607700N / *(U)Deployable Joint Command and Control*	**Project (Number/Name)** 3050 / *Deployable JT Command and Control*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3050				
System Development: Developmental Test/Operational Test FY 2017	3	2017	3	2017
System Development: Developmental Test/Operational Test FY 2018	3	2018	3	2018
System Development: Developmental Test/Operational Test FY 2019	3	2019	3	2019
System Development: Developmental Test/Operational Test FY 2020	3	2020	3	2020
System Development: Developmental Test/Operational Test FY 2021	3	2021	3	2021
System Development: Developmental Test/Operational Test FY 2022	3	2022	3	2022
System Development: Developmental Test/Operational Test FY 2023	3	2023	3	2023
Production: DJC2 System Enhancements: DJC2 System Enhancement Deliveries	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0101221N *I Strategic Sub & Wpns Sys 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**
Total Program Element	1,062.304	130.364	135.219	157.679	-	157.679	141.154	147.506	135.781	164.087	Continuing	Continuing
0951: *Joint Warhead Fuze Sustainment Program*	392.257	111.857	109.730	62.203	-	62.203	28.820	21.777	0.000	0.000	0.000	726.644
2021: *Mk4A Shape Stable Nose Tip*	0.000	0.000	6.000	30.169	-	30.169	26.653	11.844	5.987	5.987	Continuing	Continuing
2228: *Technical Applications Programs*	643.469	15.989	16.695	14.509	-	14.509	82.821	110.958	126.806	155.049	Continuing	Continuing
3097: *W78/88-1 Life Extension Program*	0.000	0.000	0.000	48.000	-	48.000	0.000	0.000	0.000	0.000	0.000	48.000
3158: *Integrated Nuclear Weapons Security Sys Dev*	26.578	2.518	2.794	2.798	-	2.798	2.860	2.927	2.988	3.051	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 178												

A. Mission Description and Budget Item Justification

The Joint Warhead Fuze Sustainment Program (0951) is an effort to develop advanced components to improve the reliability, safety, and security of Arming, Fuzing and Firing (AF&F) systems for nuclear reentry systems. The current effort is focused on supporting the alteration of the AF&F system for the MK5/W88 system which will be five years beyond its design life at the scheduled deployment of the AF&F alteration. This effort also supports future utilization of the developed components by the US Air Force and United Kingdom.

The Mk4A Shape Stable Nose Tip (SSNT) (2021) effort will convert reentry body (RB) forward shell assemblies (FSA's) from legacy carbon composite nose tips to SSNT's. This will require ground and flight testing of SSNT RBA's, updates and modifications to RB documentation (Weapon Specifications, Interface Control Drawings, product drawings etc), updated Fire Control software for fleet implementation, conversion of war reserve RB's to FSA's with SSNT, procurement/conversion of surveillance and flight test units, Strategic Weapons Facility (SWF) logistics implementation planning and execution, review and update Mk4A surveillance planning and the DoD share of National Nuclear Security Administration (NNSA) Office of Secure Transportation (OST) for shipping.

The Technology Applications Program (2228) supports the TRIDENT II (D5) Submarine Launched Ballistic Missile (SLBM) that provides the U.S. a weapon system with greater accuracy and payload capability as compared to the TRIDENT I (C4) system. TRIDENT II enhances U.S. strategic deterrence providing a survivable, sea-based system capable of engaging the full spectrum of potential targets with fewer submarines. The Multi Star Enhanced Prelaunch (MEP) project leverages the capability of the D5 Life Extension Guidance (Mk6 Mod1) to sight two stars vice one combined with the interface updates to the Fire Control and Navigation subsystem, allowing for in-flight correction, the potential to operate in environments where GPS is denied, and may provide future relief to the strict tolerance requirements of the strategic

navigator on the current OHIO class submarines and the COLUMBIA program. The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, Strategic Weapon System (SWS) Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across the SWS and system performance characterization equivalent to flight testing. This capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications. Starting in FY 2020 this project will begin development for D5 life extension 2.

The Interoperable Warhead (IW) (3097) is the first of a series of interoperable ballistic missile warheads defined in the DASD(NM) FY16 Requirements and Planning Document (RPD) under the Nuclear Weapons Council's 3+2 stockpile plan. The IW-1 will contain an interoperable nuclear explosive package for use in both the Mk21A Intercontinental Ballistic Missile (ICBM) and the Mk5 Submarine Launched Ballistic Missile (SLBM) aeroshells with adaptable non-nuclear components.

The Integrated Nuclear Weapons Security System (INWSS) (3158) efforts support the Nuclear Weapons Security program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay, or Naval Submarine Base, Bangor where missiles are first assembled as well as repaired. The Chief of Naval Operations (CNO) has assigned the Strategic Systems Programs (SSP), the FBM program manager, with mission responsibility for the safeguard of FBM nuclear technologies. This budget supports efforts directed at improving the current technological baseline through a series of studies. These efforts will improve countermeasure technologies to address detection, delay and denial.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	136.556	135.219	88.170	-	88.170
Current President's Budget	130.364	135.219	157.679	-	157.679
Total Adjustments	-6.192	0.000	69.509	-	69.509
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.026	0.000			
• SBIR/STTR Transfer	-0.666	0.000			
• Program Adjustments	0.000	0.000	72.169	-	72.169
• Rate/Misc Adjustments	0.000	0.000	-2.660	-	-2.660
• Congressional Directed Reductions Adjustments	-5.500	-	-	-	-

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0101221N *I Strategic Sub & Wpns Sys Supt*

Change Summary Explanation

The FY 2019 funding request was reduced by $0.777 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 2019 funding request was reduced by $1.771 million to account for the availability of prior year execution balances.

FY 2019 decrease of $0.889 million due to rate and inflation adjustments.

Funding decreased in FY 2017 for $6.192 million for Technical Applications contract delays, SBIR taxes and reprogramming.

Funding increased in FY 2019 for $48 million for Interoperable Warhead 6.2/6.2A study as well as the Shape Stable Nose Tip program for $24.169 million.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 0951 / *Joint Warhead Fuze Sustainment 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
0951: *Joint Warhead Fuze Sustainment Program*	392.257	111.857	109.730	62.203	-	62.203	28.820	21.777	0.000	0.000	0.000	726.644
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 178

A. Mission Description and Budget Item Justification

The Joint Warhead Fuze Sustainment Program is an effort to develop advanced components to improve the reliability, safety, and security of AF&F systems for nuclear reentry systems. The current effort is focused on supporting the alteration of the AF&F system for the MK5/W88 system which will be five years beyond its design life at the scheduled deployment of the AF&F alteration. This effort also supports future utilization of the developed components by the US Air Force and United Kingdom.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: TRIDENT II	111.857	109.730	62.203	0.000	62.203
Articles:	-	-	-	-	-
Description: Identify, prioritize, develop, proof, and demonstrate advanced technologies that will be leveraged and incorporated into future AF&Fs.					
FY 2018 Plans:					
Continue development, proofing, demonstration of identified advanced technologies for future AF&Fs					
Support engineer working groups and program reviews.					
Continue AF&F sub-assembly design demonstrations					
Continue development of advanced safety and surety architecture solutions.					
Continue detailed design					
Continue to develop and implement software changes due to AF&F					
Conduct performance assessment of tested designs					
Conduct production engineering					
Continue missile integration of the Mk5A Alt 370 fuze development, and perform pre-flight test and analysis					
Continue design, develop and qualify production tools and processes, testers, gauges, AF&F simulators and trainers					
Flight test and integration					
Continue Production Proof In (PPI) builds					
Conduct system vulnerability analysis					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 0951 / *Joint Warhead Fuze Sustainment Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Engineering support for Electromagnetic Environment testing and data analysis Conduct concept and design reviews Conduct telemetry analysis Conduct Thermal Battery Evaluations and Certifications Procurement of developmental hardware Qualification of developmental hardware					
FY 2019 Base Plans: Continue development, proofing, demonstration of identified advanced technologies for future AF&Fs Continue Support engineer working groups and program reviews. Continue AF&F sub-assembly design demonstrations Continue development of advanced safety and surety architecture solutions. Continue to develop and implement software changes due to AF&F Conduct performance assessment of tested designs Conduct production engineering Continue missile integration of the Mk5A Alt 370 fuze development, and perform pre-flight test and analysis Continue design, develop and qualify production tools and processes, testers, gauges, AF&F simulators and trainers Continue flight test and integration Continue Production Proof In (PPI) builds Conduct system vulnerability analysis Continue engineering support for Electromagnetic Environment testing and data analysis Continue thermal Battery Evaluations and Certifications Continue procurement of developmental hardware Continue qualification of developmental hardware					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The FY19 funding request was reduced by 1.771 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 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 0951 / *Joint Warhead Fuze Sustainment Program*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Decrease is attributed to rate adjustments & inflation as well as the program is transitioning from development to production (45.756M)					
Accomplishments/Planned Programs Subtotals	111.857	109.730	62.203	0.000	62.203

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/3219: *SBSD Nuclear Technology Development*	390.326	265.462	190.100	-	190.100	114.006	80.085	60.142	56.841	Continuing	Continuing
• RDTEN/3220: *Advanced Submarine System Development*	681.164	776.158	514.846	-	514.846	433.296	313.445	196.082	173.611	Continuing	Continuing
• OPN/5358: *SWS Modernization Funds*	215.138	246.221	271.817	-	271.817	274.440	241.396	254.053	259.020	Continuing	Continuing
• WPN/1250: *TRIDENT II Mods*	1,099.086	1,143.595	1,078.750	-	1,078.750	1,178.210	1,217.078	1,205.587	1,308.930	3,215.106	24,862.561
• SCN/1045: *OHIO Replacement Submarine*	0.000	842.853	3,005.330	-	3,005.330	1,453.159	4,214.573	4,198.025	3,875.888	90,686.558	108,276.386
• OMN/1D2D: *Fleet Ballistic Missile*	1,054.157	1,068.691	1,140.210	-	1,140.210	1,163.723	1,176.612	1,206.640	1,230.743	0.000	8,040.776

Remarks

D. Acquisition Strategy

Contracts will continue to be awarded to those sources who were engaged in the Mk4LE Reentry Body development program and are currently engaged in the production and/or operational support of the deployed Mk4LE Reentry Body on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

E. Performance Metrics

Not applicable

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 0951 / *Joint Warhead Fuze Sustainment Program*

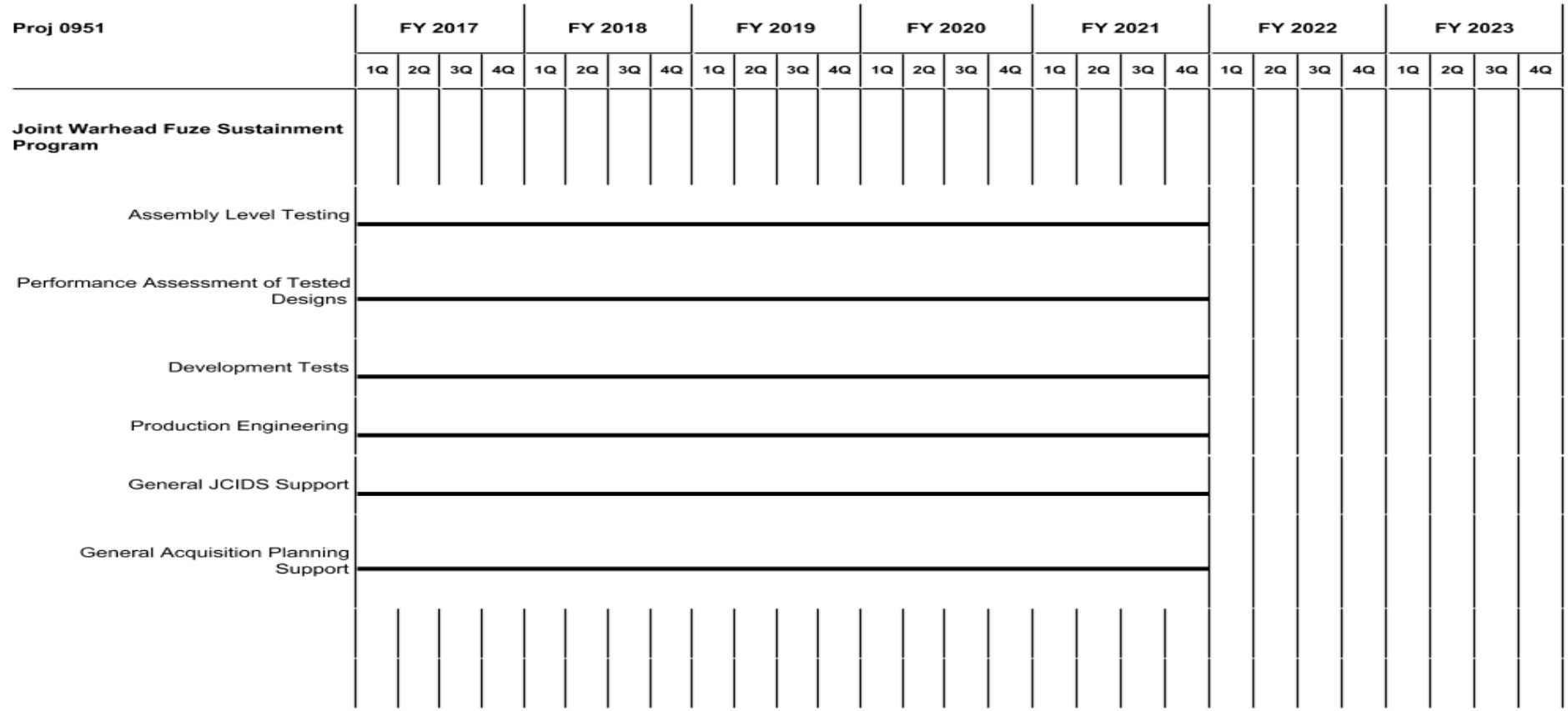
Product Development ($ in Millions)

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
Joint Warhead Fuze Sustainment DOE	MIPR	DOE : NM	324.328	91.257	Dec 2016	92.466	Feb 2018	48.855	Nov 2018	-		48.855	0.000	556.906	-
Joint Warhead Fuze Sustainment ITT	SS/CPFF	ITT : VA	14.907	4.000	Nov 2016	4.265	Feb 2018	3.851	Dec 2018	-		3.851	0.000	27.023	-
Joint Warhead Fuze Sustainment LMMS	SS/CPFF	LMMS : CA	34.887	11.930	Nov 2016	11.793	Feb 2018	7.931	Oct 2018	-		7.931	0.000	66.541	-
Joint Warhead Fuze Sustainment	WR	NSWC Dahlgren : VA	16.141	2.465	Dec 2016	0.318	Feb 2018	0.551	Nov 2018	-		0.551	0.000	19.475	-
Joint Warhead Fuze Sustainment	SS/CPFF	BAE : MD	0.729	0.505	Dec 2016	0.505	Mar 2018	0.150	Nov 2018	-		0.150	0.000	1.889	-
Joint Warhead Fuze Sustainment	SS/CPIF	APL : MD	0.785	0.000		0.144	Mar 2018	0.073	Dec 2018	-		0.073	0.000	1.002	-
Joint Warhead Fuze Sustainment	C/BA	GDAIS : MA	0.180	1.500	Dec 2016	0.000		0.000		-		0.000	0.000	1.680	-
Joint Warhead Fuze Sustainment	WR	CNSW : ID	0.200	0.200	Oct 2016	0.239	Feb 2018	0.000		-		0.000	0.000	0.639	-
Joint Warhead Fuze Sustainment	WR	NCCC : Not Specified	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	-
Joint Warhead Fuze Sustainment	C/BA	Various : Not Specified	0.000	0.000		0.000		0.792	Nov 2018	-		0.792	0.000	0.792	-
		Subtotal	392.257	111.857		109.730		62.203		-		62.203	0.000	676.047	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	392.257	111.857		109.730		62.203		-		62.203	0.000	676.047	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 0951 / *Joint Warhead Fuze Sustainment Program*



2019DON - 0101221N - 0951

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 0951 / *Joint Warhead Fuze Sustainment Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0951				
Joint Warhead Fuze Sustainment Program: Assembly Level Testing:	1	2017	4	2021
Joint Warhead Fuze Sustainment Program: Performance Assessment of Tested Designs:	1	2017	4	2021
Joint Warhead Fuze Sustainment Program: Development Tests:	1	2017	4	2021
Joint Warhead Fuze Sustainment Program: Production Engineering:	1	2017	4	2021
Joint Warhead Fuze Sustainment Program: General JCIDS Support:	1	2017	4	2021
Joint Warhead Fuze Sustainment Program: General Acquisition Planning Support:	1	2017	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 2021 / *Mk4A Shape Stable Nose Tip*	

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
2021: *Mk4A Shape Stable Nose Tip*	0.000	0.000	6.000	30.169	-	30.169	26.653	11.844	5.987	5.987	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 178

A. Mission Description and Budget Item Justification

The Mk4A Shape Stable Nose Tip (SSNT) effort will convert reentry body (RB) forward shell assemblies (FSA's) from legacy carbon composite nose tips to SSNT's. This will require ground and flight testing of SSNT RBA's, updates and modifications to RB documentation (Weapon Specifications, Interface Control Drawings, product drawings etc), updated Fire Control software for fleet implementation, conversion of war reserve RB's to FSA's with SSNT, procurement/conversion of surveillance and flight test units, Strategic Weapons Facility (SWF) logistics implementation planning and execution, review and update Mk4A surveillance planning and the DoD share of National Nuclear Security Administration (NNSA) Office of Secure Transportation (OST) for shipping.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Mk4A Shape Stable Nose Tip	0.000	6.000	30.169	0.000	30.169
Articles:	-	-	-	-	-
FY 2018 Plans: Strategic Systems Programs Alteration (SPALT) documentation Analyze & review reentry body (RB) aerodynamics data for future Fire Control updates Scaling laboratory conversion process of RB Forward Shell Assemblies (FSA's) to accept shape stable nose tips (SSNT's) in to a production environment Procure development nose tip billet material units to support material qualification testing OCO: Not Applicable					
FY 2019 Base Plans: Mk4A SSNT system requirements review SPALT/NWRO documentation Development of the reentry body aerodynamics model and associated fire control flight parameters Updates and modifications to requirements documentation Nosetip development hardware to support nosetip development testing					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2021 / *Mk4A Shape Stable Nose Tip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Qualification and buildup for forward shell development testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding in FY 2018 initiated the program. The increase from FY 2018 to FY 2019 is attributable to FY 2019 being the first year of full development. The FY 2019 effort includes incorporation of SSNT and updates into the Mk4A reentry body aerodynamics model, nosetip hardware development builds that support nosetip qualification and forward shell build up for developmental testing prior to system flight tests, initiating system safety assessment, documenting and updating requirements specifications, system requirements review, and a complete review of impacted TRIDENT II (D5) and W76-1/Mk4A related documentation.					
Accomplishments/Planned Programs Subtotals	0.000	6.000	30.169	0.000	30.169

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Contracts will continue to be awarded to those sources who were engaged in the Mk4LE Reentry Body development program and are currently engaged in the production and/or operational support of the deployed Mk4LE Reentry Body on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2021 / *Mk4A Shape Stable Nose Tip*

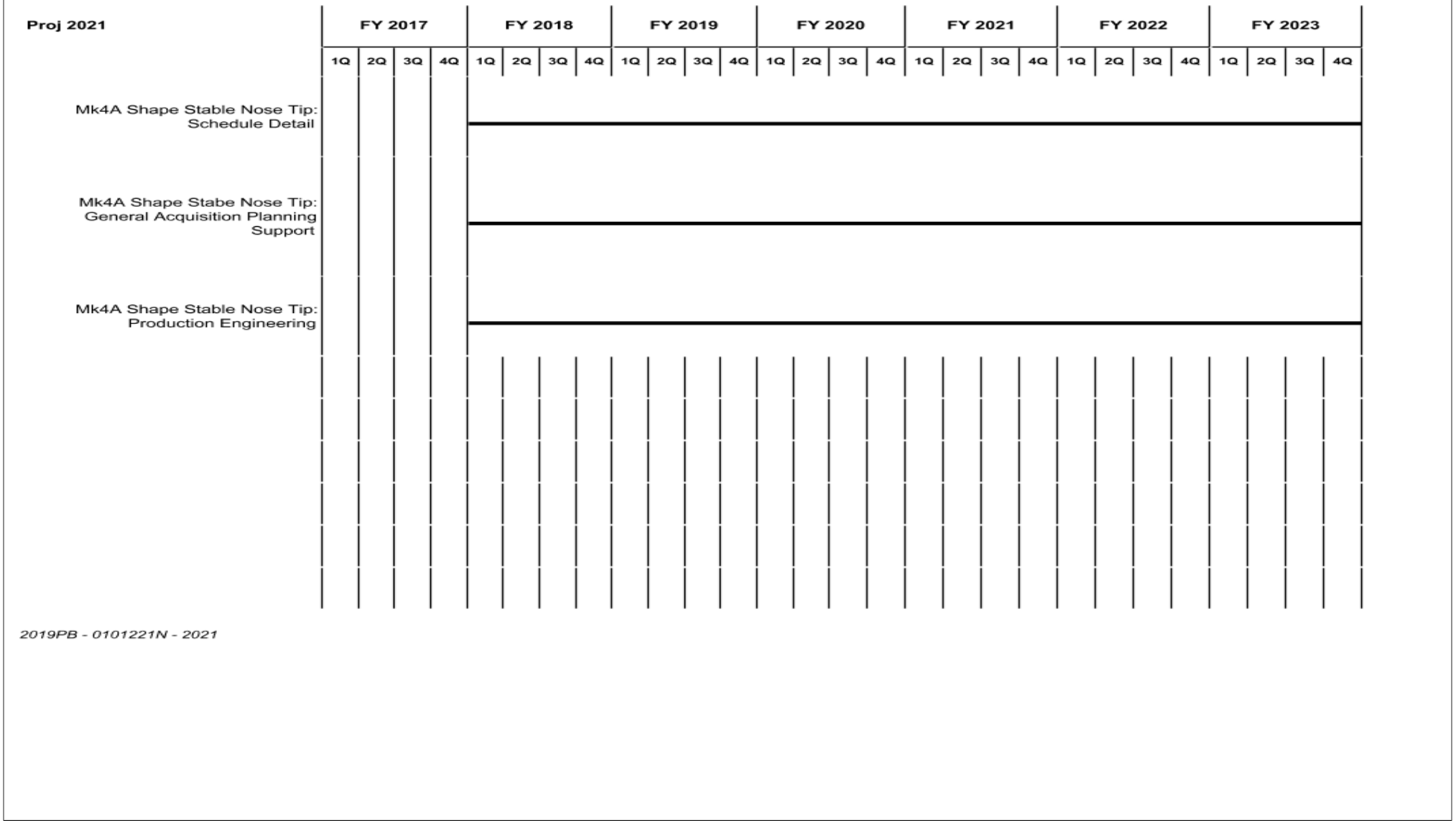
Product Development ($ in Millions)

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
SSNT LMSS	TBD	LMSS : CA	0.000	0.000		5.000	Apr 2018	27.000	Dec 2018	-		27.000	Continuing	Continuing	Continuing
SSNT NSWC	TBD	NSWC : VA	0.000	0.000		1.000	Apr 2018	3.169	Dec 2018	-		3.169	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		6.000		30.169		-		30.169	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		6.000		30.169		-		30.169	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2021 / *Mk4A Shape Stable Nose Tip*



2019PB - 0101221N - 2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2021 / *Mk4A Shape Stable Nose Tip*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2021				
Mk4A Shape Stable Nose Tip: Schedule Detail: Schedule Detail	1	2018	4	2023
Mk4A Shape Stabe Nose Tip: General Acquisition Planning Support: Schedule Detail	1	2018	4	2023
Mk4A Shape Stable Nose Tip: Production Engineering: Schedule Detail	1	2018	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 2228 / *Technical Applications Programs*	

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
2228: *Technical Applications Programs*	643.469	15.989	16.695	14.509	-	14.509	82.821	110.958	126.806	155.049	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Multi Star Enhanced Prelaunch (MEP) project leverages the capability of the D5 Life Extension Guidance (Mk6 Mod1) to sight two stars vice one combined with the interface updates to the Fire Control and Navigation subsystem, allowing for in-flight correction, the potential to operate in environments where Global Positioning System (GPS) is denied, and potential future relief to the strict tolerance requirements of the strategic navigator on the current OHIO class submarines and the COLUMBIA Class program. The Systems Engineering Modeling and Simulation capability will consist of three elements: Model Based Design, Strategic Weapon System (SWS) Integrated Modeling and Simulation/Common Architecture & Framework, and SWS Enhancement Ground Test. This effort will provide the capability to comprehensively evaluate and test the integrated SWS within representative operational environments, providing unprecedented visibility across the SWS and system performance characterization equivalent to flight testing. This capability will enable trade space analysis to identify technical margin, subsystem interactions, and lifecycle affordability opportunities to include other services and be able to identify the benefits and risks of commonality to the individual programs, requirements and CONOPs modifications that could facilitate commonality, potential common acquisition strategies between the services, and total life cycle cost implications.

In FY 2020, development for D5 Life Extension 2 (D5LE2) commences. The D5LE2 will include System Level Architecture Trades and Design Processes in which initial planning and system technology trade actives are necessary to begin preparing for D5LE2 SRR currently scheduled for FY 2025. (Investments are required starting in FY20 to begin trading system architecture concepts and implementing modern model based design and system engineering practices.) D5LE2 Avionics Architecture & Technology Development will include legacy D5 and D5LE electronic technologies now obsolete and manufacturing lines shutdown. Avionics architectures, sensor, bus and component designs are inherently complex with design and manufacturing technologies continuously evolving. Technology advancements and improved system architecture concepts have the potential to improve system capability, modularity, manufacturability, SWS operations and sustainability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Multi-Star Enhanced Prelaunch (MEP)	8.757	13.030	9.973	0.000	9.973
Articles:	-	-	-	-	-
FY 2018 Plans:					
MEP DASO 30 Critical Design Review					
DASO 30 Hardware in the Loop Testing					
Fire Control DASO 30 Software Integrated Baseline Development					
Navigation DASO 30 Software Integration Build Development					
Guidance DASO 30 Software Independent Verification and Validation Testing					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
DASO 30 SWS Subsystem Integrated Testing and Analysis DASO 30 Interface Coordination Documentation finalized ***FY 2019 Base Plans:*** Continue DASO 30 Hardware in the Loop Testing Navigation DASO 30 Software Integration Development Continue DASO 30 SWS Subsystem Integrated Testing and Analysis DASO 30 Interface Coordination Documentation complete Software design readiness review DASO Shipment ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease is attributed to completion of the Fire Control DASO 30 software integrated baseline development & the Navigation DASO 30 software integration build development					
Title: System Engineering Modeling and Simulation	7.232	3.665	4.536	0.000	4.536
Articles:	-	-	-	-	-
FY 2018 Plans: Continue develop model based design integration plan. Continue modeling and simulation gap analysis. Continue assessment on RadHard avionics and electronics technology and affordability. Continue assessment on propellant technologies. Continue assessment on new Post Boost Control and Electro-Mechanical Thrust Vector Control (TVC) systems for improved mission flexibility and affordability. ***FY 2019 Base Plans:*** Continue develop model based design integration plan. Continue modeling and simulation gap analysis. Continue assessment on RadHard avionics and electronics technology and affordability. Continue assessment on propellant technologies. Continue assessment on new Post Boost Control and Electro-Mechanical Thrust Vector Control (TVC) systems for improved Mission flexibility and affordability.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Begin Functional Simulation Development. Begin system Behavioral Model Development. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase is attributed to beginning functional simulation development & beginning system behavioral model development.					
Accomplishments/Planned Programs Subtotals	15.989	16.695	14.509	0.000	14.509

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Contracts will continue to be awarded to those sources who were engaged in program and are currently engaged in the production and/or operational support on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

E. Performance Metrics

Not applicable

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 2228 / *Technical Applications Programs*	

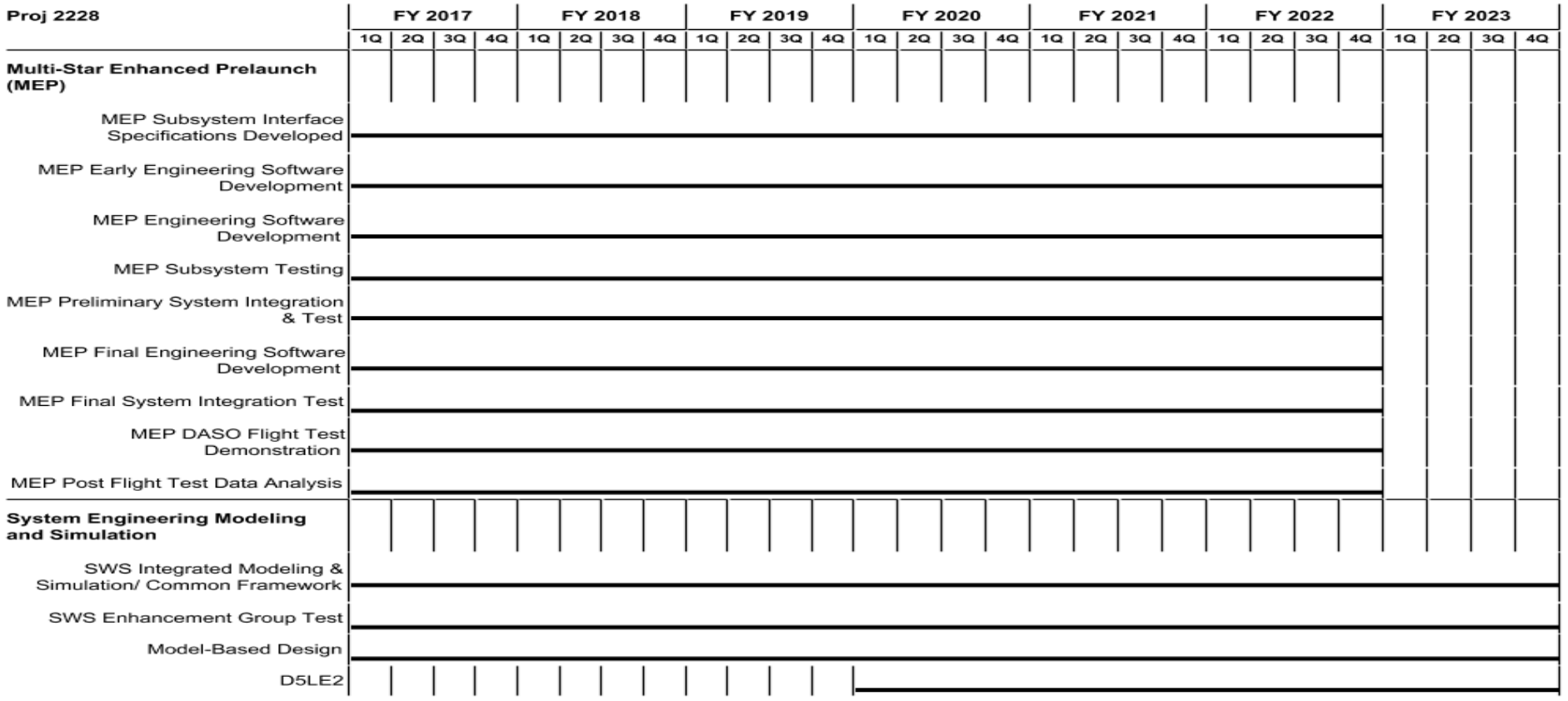
Product Development ($ in Millions)

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
Technical Applications CSDL	SS/CPFF	CSDL : MA	322.249	11.323	May 2017	13.750	Feb 2018	11.757	Nov 2018	-		11.757	Continuing	Continuing	Continuing
Technical Applications NSWC	WR	NSWC : VA	93.474	0.844	May 2017	0.300	Feb 2018	0.352	Nov 2018	-		0.352	Continuing	Continuing	Continuing
Technical Applications DOE	MIPR	DOE : NM	33.717	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications ITT	SS/CPFF	ITT : CO	12.194	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications LMSS	SS/CPFF	LMSS : CA	160.450	3.822	May 2017	1.000	Feb 2018	1.800	Nov 2018	-		1.800	Continuing	Continuing	Continuing
Technical Applications AERO	SS/CPFF	AERO : CA	3.068	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications VAR	Various	Various : Various	18.317	0.000		1.345	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Technical Applications GD-AIS	SS/CPFF	GDMS : MA	0.000	0.000		0.300	Oct 2017	0.600	Nov 2018	-		0.600	Continuing	Continuing	Continuing
		Subtotal	643.469	15.989		16.695		14.509		-		14.509	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	643.469	15.989		16.695		14.509		-		14.509	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*



2019PB - 0101221N - 2228

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 2228 / *Technical Applications Programs*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2228				
Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Interface Specifications Developed:	1	2017	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Early Engineering Software Development:	1	2017	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Engineering Software Development:	1	2017	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Subsystem Testing:	1	2017	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Preliminary System Integration & Test:	1	2017	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Final Engineering Software Development:	1	2017	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Final System Integration Test:	1	2017	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP DASO Flight Test Demonstration:	1	2017	4	2022
Multi-Star Enhanced Prelaunch (MEP): MEP Post Flight Test Data Analysis:	1	2017	4	2022
System Engineering Modeling and Simulation: SWS Integrated Modeling & Simulation/ Common Framework:	1	2017	4	2023
System Engineering Modeling and Simulation: SWS Enhancement Group Test:	1	2017	4	2023
System Engineering Modeling and Simulation: Model-Based Design:	1	2017	4	2023
System Engineering Modeling and Simulation: D5LE2:	1	2020	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3097 / *W78/88-1 Life Extension 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
3097: *W78/88-1 Life Extension Program*	0.000	0.000	0.000	48.000	-	48.000	0.000	0.000	0.000	0.000	0.000	48.000
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FY 2019 NEW Start effort (IW-1); The Interoperable Warhead (IW) is the first of a series of interoperable ballistic missile warheads defined in the DASD(NM) FY1 206 Requirements and Planning Document (RPD) under the Nuclear Weapons Council's 3+2 stockpile plan. The IW-1 will contain an interoperable nuclear explosive package for use in both the Mk21A Intercontinental Ballistic Missile (ICBM) and the Mk5 Submarine Launched Ballistic Missile (SLBM) aeroshells with adaptable non-nuclear components.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: IW	0.000	0.000	48.000	0.000	48.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Systems Engineering Program Plan (SEMP) System Qualification and SPALT planning Ground and flight test program planning System requirements definition. System Requirements Review (SRR) DoD/DoE and Missile/Reentry/Fire Control interface definition Subsystem design integration and assessments System assessment tools and models development System Safety Program Plan Thermal Protection System/ Release Assembly (TPS/RA) conceptual design Technology Readiness Level/ Manufacturing Readiness Level (TRL/MRL) assessment Nuclear Explosive Package (NEP) design integration Radar Module, pathlength Module,and missile Interface and Controller Module Fire Control requirements definition & software development					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W78/88-1 Life Extension Program*

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 increase of $48 million due to funding Interoperable Warhead (IW)-1 for the 6.2/6.2A Study.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	48.000	0.000	48.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Contracts will be awarded to those sources who were engaged in the W78/88-1 Life Extension Program and are currently engaged in the production and/or operational support of the deployed W78/88-1 Systems on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3, 4

E. Performance Metrics

Not Applicable

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W78/88-1 Life Extension Program*

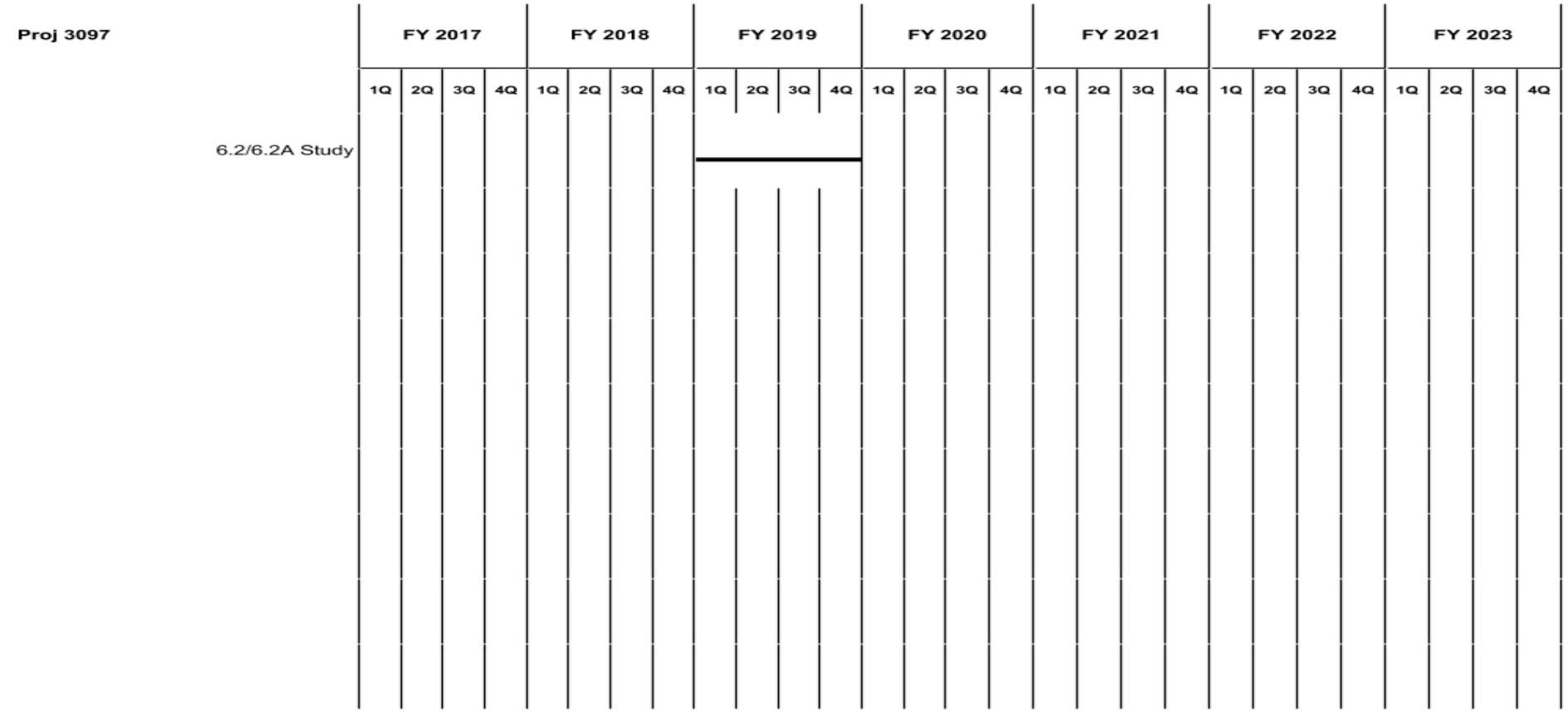
Product Development ($ in Millions)

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
DOE	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		24.000	Oct 2018	-		24.000	0.000	24.000	-
LMSSC	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		24.000	Oct 2018	-		24.000	0.000	24.000	-
		Subtotal	0.000	0.000		0.000		48.000		-		48.000	0.000	48.000	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	0.000	0.000		0.000		48.000		-		48.000	0.000	48.000	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W78/88-1 Life Extension Program*



2019PB - 0101221N - 3097

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3097 / *W78/88-1 Life Extension Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3097				
6.2/6.2A Study:	1	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3158 / *Integrated Nuclear Weapons Security 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
3158: *Integrated Nuclear Weapons Security Sys Dev*	26.578	2.518	2.794	2.798	-	2.798	2.860	2.927	2.988	3.051	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Special Weapons effort supports the Nuclear Weapons Security (NWS) program and SSBN Escort mission. The policies and requirements regarding the safeguard of nuclear weapons within the Department of Defense is established by DoD S5210.41M. Within the Department of the Navy, nuclear weapons are limited to TRIDENT Fleet Ballistic Missiles (FBM), either deployed aboard TRIDENT submarines or located landside at Naval Submarine Base, Kings Bay or Naval Submarine Base, Bangor where missiles are first assembled as well as repaired. The CNO has assigned SSP, the FBM program manager, with mission responsibility for the safeguard of FBM nuclear assets. More specifically, the mission includes landside and pier operations as well as transits to and from the dive point, each of which present challenges to personnel as well as existing technologies. This budget supports efforts directed at improving the current technological baseline through a series of studies focusing on land and in transit requirements. Collectively, these efforts will improve countermeasure technologies addressing detection, delay and denial.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Integrated Nuclear Weapons Security Sys Dev	2.518	2.794	2.798	0.000	2.798
Articles:	-	-	-	-	-
FY 2018 Plans: Continue Wide Area/Extended Detection: Development of technologies to increase detection, localization, classification, and tracking capabilities beyond the perimeter of the limited area, waterfront restricted area, along the convoy route and transit route. This effort includes technologies to detect intruders in difficult environments such as dense foliage, marsh, fog and heavy rain. Continue research and development efforts towards the improvement of countermeasures technologies addressing detection, delay and denial. Continue Analysis of Alternatives on WQX-2 follow on Sensor Selection & Transition					
FY 2019 Base Plans: Continue Wide Area/Extended Detection: Development of technologies to increase detection, localization, classification, and tracking capabilities beyond the perimeter of the limited area, waterfront restricted area, along the convoy route and transit route. This effort includes technologies to detect intruders in difficult environments such as dense foliage, marsh, fog and heavy rain. Continue research and development efforts towards the improvement of countermeasures technologies addressing detection, delay and denial.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3158 / *Integrated Nuclear Weapons Security 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
Continue Analysis of Alternatives on WQX-2 follow on Sensor Selection & Transition ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant changes from FY 2018 to FY 2019.					
Accomplishments/Planned Programs Subtotals	2.518	2.794	2.798	0.000	2.798

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
• OPN/Various-2: *OPN (Nuclear Weapons Security)*	37.810	28.513	29.852	-	29.852	41.991	34.427	35.098	35.791	Continuing	Continuing
• OMN/11D2D-3: *Fleet Ballistic Missile (Nuclear Weapons Security)*	76.415	89.045	81.424	-	81.424	82.935	84.507	86.103	87.865	Continuing	Continuing
• OMN/11D2D-5: *Fleet Ballistic Missile (Transit/Escort)*	110.522	90.816	110.641	-	110.641	102.697	105.874	107.790	109.659	Continuing	Continuing
• MCN/Various-1: *MILCON (CNI) (Nuclear Weapons Security)*	0.000	0.000	88.960	-	88.960	0.000	0.000	0.000	155.440	0.000	386.589
• WPN/4129/0101228N: *Small Arms*	7.007	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.307

Remarks

D. Acquisition Strategy

Procurements are being executed through a combination of private contractors (large and small business), government Centers of Excellence (COEs), other government agencies and the Naval Submarine Bases, Kitsap and Kings Bay. Contract awards are based upon "best value" determinations, and where practical will be performance based or include incentive provisions.

E. Performance Metrics

Not applicable

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3158 / *Integrated Nuclear Weapons Security 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
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	JHU APL : MD	3.895	0.000		0.275	Feb 2018	0.199	Oct 2018	-		0.199	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	NSWC : VA	3.675	0.622	May 2017	0.252	Oct 2017	0.201	Dec 2018	-		0.201	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	JRC : VA	2.620	0.400	Mar 2017	0.276	Feb 2018	0.233	Oct 2018	-		0.233	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	DRAPER : MA	0.355	0.000		0.000		0.201	Nov 2018	-		0.201	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	CNSW : ID	0.000	0.000		0.720	Feb 2018	1.300	Nov 2018	-		1.300	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/CPFF	GDMS : MA	0.000	0.000		0.442	Feb 2018	0.456	Nov 2018	-		0.456	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys	C/BA	ONR : DC	0.000	0.000		0.000		0.208	Dec 2018	-		0.208	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	NFESC : CA	2.700	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	CNWS : CA	0.404	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	SNWS : CA	4.558	0.000		0.222	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	MIPR	DOE : NM	0.425	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	ARL : TX	1.880	0.000		0.225	Feb 2018	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 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3158 / *Integrated Nuclear Weapons Security 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
Integrated Nuclear Weapons Security Sys Dev	WR	NUWD : WA	0.881	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	NRL : DC	0.628	0.560	May 2017	0.262	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	NUWC : RI	1.578	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	SPAWAR : CA	0.390	0.000		0.120	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	C/BA	SPA : VA	0.000	0.475	May 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	MIPR	ATC : TX	0.000	0.461	May 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	WR	NEDU : FL	0.383	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	SS/CPFF	LMSS : CA	2.026	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Nuclear Weapons Security Sys Dev	MIPR	DOEI : ID	0.180	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	26.578	2.518		2.794		2.798		-		2.798	Continuing	Continuing	N/A

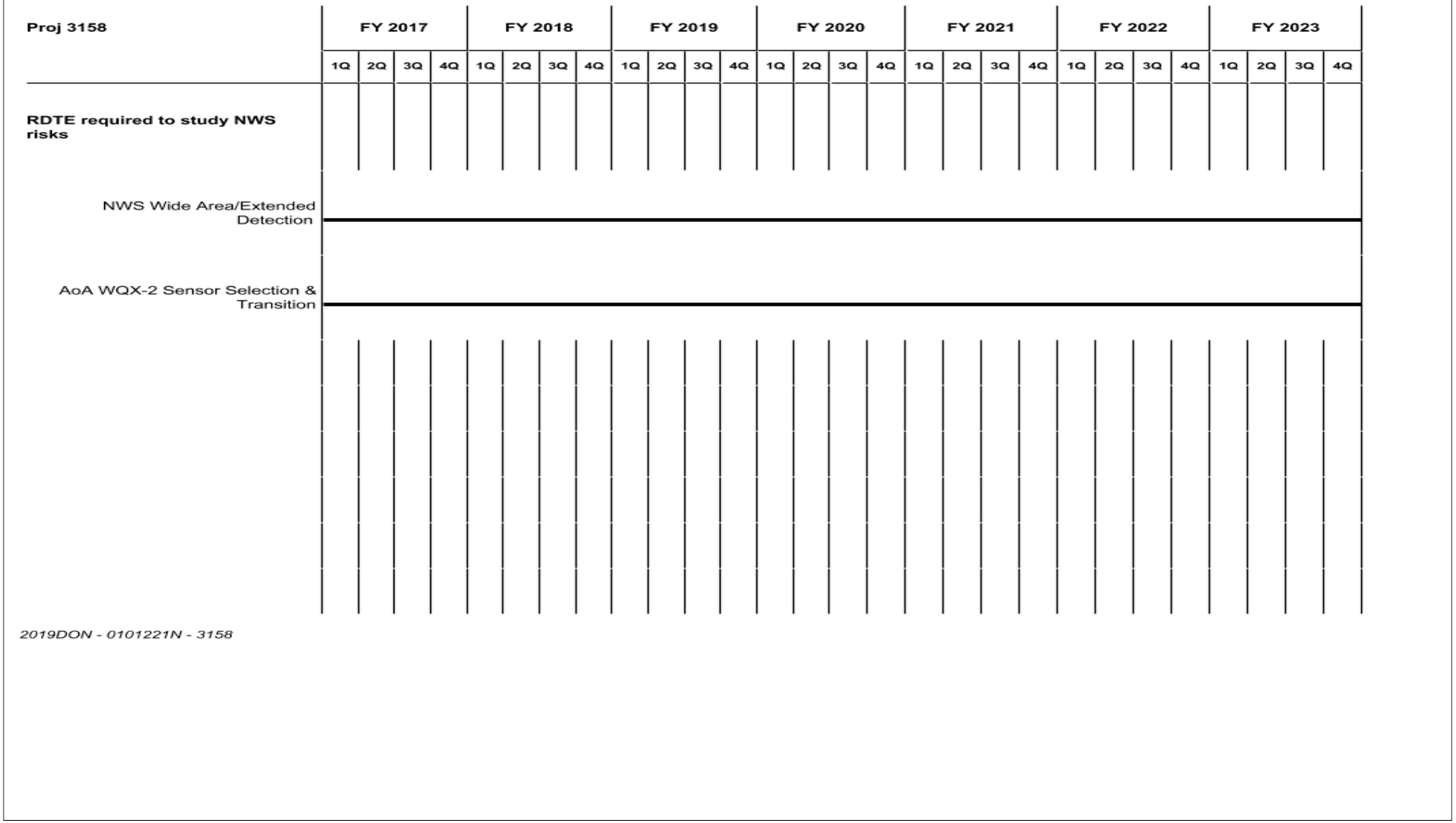
	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	26.578	2.518		2.794		2.798		-		2.798	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101221N / *Strategic Sub & Wpns Sys Supt*	Project (Number/Name) 3158 / *Integrated Nuclear Weapons Security Sys Dev*	

	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 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3158 / *Integrated Nuclear Weapons Security Sys Dev*



2019DON - 0101221N - 3158

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101221N / *Strategic Sub & Wpns Sys Supt*	**Project (Number/Name)** 3158 / *Integrated Nuclear Weapons Security Sys Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3158				
RDTE required to study NWS risks: NWS Wide Area/Extended Detection:	1	2017	4	2023
RDTE required to study NWS risks: AoA WQX-2 Sensor Selection & Transition: Schedule Detail	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0101224N *I SSBN Security Tech 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	0.000	32.910	36.242	43.198	-	43.198	43.889	46.638	47.473	48.373	Continuing	Continuing
0092: *SSBN Security*	0.000	32.910	36.242	43.198	-	43.198	43.889	46.638	47.473	48.373	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET 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	33.845	36.242	37.163	-	37.163
Current President's Budget	32.910	36.242	43.198	-	43.198
Total Adjustments	-0.935	0.000	6.035	-	6.035
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.898	0.000			
• Rate/Misc Adjustments	0.000	0.000	6.035	-	6.035
• Congressional General Reductions Adjustments	-0.037	-	-	-	-

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0101226N *I Submarine Acoustic War 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	41.943	7.300	12.053	11.311	-	11.311	9.309	13.436	13.697	13.997	Continuing	Continuing
1265: *Sub Defensive Warfare*	41.943	7.300	12.053	11.311	-	11.311	9.309	13.436	13.697	13.997	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.046 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 Submarine Acoustic Warfare Development program element is comprised of the Submarine Defensive Warfare Program. The objective is to maintain and improve the survivability of all U.S. submarine classes in response to torpedo attack. Efforts include Submarine Torpedo Defense System Program (SubTDS), the Torpedo Defense Working Group (TDWG), Technical Direction Agent (TDA) and In-Service Engineering Agent (ISEA) hardware and software development support for Acoustic Devices Countermeasures (ADCs), Countermeasures Set, Acoustic (CSA) systems and Acoustic Augmentation Support Systems (AASS) in the Acoustic Augmentation Support Program (AASP), including component level technical insertion. SubTDS is comprised of the ADC MK5 Devices (formally known as the Next Generation Countermeasure (NGCM) Program), a tactical decision aid (TacDA) and a SABOT that permits the ADC MK5 to be employed from the external countermeasure launcher (ECL). Also, this program transitions the research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives to the SubTDS. Additionally, this effort also includes product development and improvements for Submarine Acoustic Warfare systems (SAWS) including but not limited to AASP and SubTDS.

In FY2018 the SubTDS TEMP is planned to be completed and in FY2018 the ADC MK5 Contract will award in the second quarter.

In FY2019 funding will primarily support on-going ADC MK5 development including component and subsystem design, design and delivery of three Engineering Development Model (EDM) variants, and the start of joint contractor/government Developmental Testing (DT). Governmental development of the SABOT and TacDA will continue to include initial integration with the contractor developed ADC MK5 device and SABOT DT.

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 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0101226N *I Submarine Acoustic War Dev*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	9.329	12.053	9.330	-	9.330
Current President's Budget	7.300	12.053	11.311	-	11.311
Total Adjustments	-2.029	0.000	1.981	-	1.981
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.825	0.000			
• SBIR/STTR Transfer	-0.205	0.000			
• Program Adjustments	0.000	0.000	2.154	-	2.154
• Rate/Misc Adjustments	0.001	0.000	-0.173	-	-0.173

Change Summary Explanation

Schedule: The developmental effort will include torpedo threat analysis and integration, Concept of Operations (CONOPS) for fleet tactics evaluation, Tactical Decision Aid (TacDA) development, and sabot development for External Countermeasure Launcher (ECL) capability. A single, new development contract resulting in fully functional EDM device variants will be awarded in FY2018. The developmental contract will consist of a 4 year development effort and the 5th year will provide Low-Rate Initial Production (LRIP) units for accomplishing operational testing (OT) in FY2022-2023. Milestone C is notionally planned for FY2022.

In FY2019 the program will deliver three ADC MK5 Engineering Development Model (EDM) variants and begin Development Testing (DT).

Financial:
FY2017 decrease of $1.825 million for reprogramming for higher navy priorities.

The Department added additional FY2019 funding (2.200 million) to maintain SubTDS schedule.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101226N / *Submarine Acoustic War Dev*	Project (Number/Name) 1265 / *Sub Defensive 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
1265: *Sub Defensive Warfare*	41.943	7.300	12.053	11.311	-	11.311	9.309	13.436	13.697	13.997	Continuing	Continuing
Quantity of RDT&E Articles		-	-	32	-	32	43	90	75	-		

A. Mission Description and Budget Item Justification

This project supports the Submarine Acoustic Warfare System (SAWS) program to maintain and improve the survivability of all U.S. submarine classes in response to torpedo attack. This program funds:

1. Submarine Torpedo Defense System (SubTDS)program, (ACAT III) currently is in Engineering and Manufacturing Development (E&MD). The ADC MK5 Device Developmental Contract will be awarded in FY18, through a full and open competition, Cost Plus Incentive Fee (CPIF) contract, and government development in SABOT and Tactical Decision Aid development. The ADC MK5 development contract will result in delivering fully functional test units and EDM variants that include: (4) Configuration Control Tools(CCT), (4) Special Test Units(STU), (4) STU Electronics Boards for WAF, (17) EDM-1 devices, (10) Launchable Inerts EDM-2, (20) EDM-2 Environmental Qualification Testing(EQT) devices, (3) EDM-2T devices, (75)Low-Ray Initial Production (LRIP) devices. The key new capabilities ADC MK5 brings are: adaptive countermeasure (ACM) technology with full duplex capability and mobility packaged in a three inch diameter body. Milestone C is nominally 2022. Increment 2 of the Submarine Torpedo Defense System (SubTDS) will start in FY2023.
2. The Torpedo Defense Working Group (TDWG). A working group comprised of fleet, resource sponsor, and acquisition community representatives to assess countermeasure effectiveness against fleet threats, both known and projected, with associated studies, models, and simulations.
3. The Technical Direction Agent (TDA) and In-Service Engineering Agent (ISEA) hardware and software development support for Acoustic Devices Countermeasure (ADC) (ADC MK 2, 3 & 4) as well as Countermeasures Set, Acoustic (CSA) MK 2, MK 3, MK 4 systems, future ADC variants and Acoustic Augmentation Support Systems (AASS) in the Acoustic Augmentation Support Program (AASP), including component level technical insertion.
4. Research and development of new technologies and capabilities developed under the Future Naval Capabilities (FNC), Small Business and Innovative Research (SBIR), and other Research, Development, Test & Evaluation (RDT&E) initiatives. New and emerging hardware and software are evaluated in representative acoustic environments, against projected threats through both digital and hardware-in-the-loop simulations, to determine their effectiveness and impact on improving submarine survivability. The technology is then incorporated into the appropriate product line.

FY 2019 funding will primarily support on-going SubTDS development including component and subsystem design, design and delivery of three Engineering Development Model (EDM) variants, and joint contractor/government Development Testing (DT). Governmental development of the SABOT and Tactical Decision Aid (TacDA) will continue to include initial integration with the contractor developed ADC MK5 device and SABOT DT.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Sub Acoustic Warfare	7.300	12.053	11.311	0.000	11.311
Articles:	-	-	32	-	32
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101226N / *Submarine Acoustic War Dev*	**Project (Number/Name)** 1265 / *Sub Defensive Warfare*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Award ADC MK5 New Development Contract. - Continue ADC MK5 Engineering and Manufacturing Development Phase under development contract - Begin first three EDM variant designs and prepare for ADC MK5 Critical Design Review - Continue M&S for known and projected torpedo threats - Continue development of required program documentation - Continue development of Concept of Operations (CONOPS) and TacDA for fleet tactics - Continue SABOT development for external launch - Conduct SABOT Preliminary Design Review - Continue assessment of threat by TDWG and WAF with updated vulnerability assessments - Complete SubTDS TEMP ***FY 2019 Base Plans:*** - Continue EDM designs and builds - Deliver three ADC MK5 Engineering Development Model (EDM) variants - Begin DT - Continue M&S for known and projected torpedo threats - Continue development of required program documentation - Continue development of CONOPS and TacDA for fleet tactics - Continue SABOT Development and Conduct Critical Design Review - Continue assessment of threat by TDWG and WAF with updated vulnerability assessments ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY 18 to FY 19 based on phasing of planned development events.					
Accomplishments/Planned Programs Subtotals	7.300	12.053	11.311	0.000	11.311

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/2210: *Submarine Acoustic Warfare System*	21.291	21.449	23.815	-	23.815	25.156	25.309	26.065	26.600	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101226N / *Submarine Acoustic War Dev*	**Project (Number/Name)** 1265 / *Sub Defensive Warfare*

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

Submarine Acoustic Warfare System (SAWS) develops Undersea Defensive Warfare technologies to improve the survivability of all U.S. Submarine classes. The integration of technology into the ADC MK5 and the ADC MK5-capable CSA MK 3/4 external countermeasure launcher system will continue through FY2023. The ADC MK5 development contract will be awarded in FY2018, through a full and open competition, Cost Plus Incentive Fee (CPIF) contract. Engineering Development Model (EDM) variants, Technical Data Packages (TDP), and Low-Rate Initial Production (LRIP) units for accomplishing Operational Testing, will be delivered to the Navy under this contract. ADC MK5 contractor subsystem testing will occur in FY2018 through FY2022 and joint contractor/Navy Development Testing (DT) will be in FY2019 through FY2021, with Navy Operational Testing (OT) in FY2022 through FY2023. Milestone C is nominally in FY2022. Initial Operational Capability (IOC) is nominally FY2024 for both the Internal Countermeasure Launcher (ICL) and External Countermeasure Launcher (ECL)capability of the ADC MK5. The production contract solicitation will be issued in FY2023. After successfully completing OT and Full Rate Production Decision Review (FRP DR) approval, award production contract in FY2024, as a full and open competition, build to print approach with either a single producer or leader/follower production contract.

E. Performance Metrics

Progress Reviews
Execution Reporting and Reviews
Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101226N / *Submarine Acoustic War Dev*	Project (Number/Name) 1265 / *Sub Defensive 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
WAF ANALYSIS TDWG	WR	NUWC : NEWPORT, RI	11.814	0.700	Dec 2016	0.275	Dec 2017	0.280	Dec 2018	-		0.280	Continuing	Continuing	Continuing
SubTDS SYSYTEM ENGINEERING	WR	NUWC : NEWPORT, RI	9.940	1.700	Dec 2016	1.566	Dec 2017	1.095	Dec 2018	-		1.095	Continuing	Continuing	Continuing
ADC MK5 New Development	C/CPIF	TBD : TBD	0.000	0.000		5.100	Jan 2018	5.266	Dec 2018	-		5.266	Continuing	Continuing	Continuing
CSA MK5 SYSTEM ENGINEERING	WR	NUWC : KEYPORT, WA	1.995	1.020	Dec 2016	1.200	Dec 2017	0.700	Dec 2018	-		0.700	Continuing	Continuing	Continuing
Modeling And Simulation	WR	NUWC : NEWPORT, RI	2.662	1.200	Dec 2016	1.332	Dec 2017	1.100	Dec 2018	-		1.100	Continuing	Continuing	Continuing
Tactical Decision Aid	WR	NUWC : NEWPORT, RI	0.600	1.800	Dec 2016	1.300	Dec 2017	1.300	Dec 2018	-		1.300	Continuing	Continuing	Continuing
Sabot Development	WR	NUWC : NEWPORT, RI	0.879	0.400	Dec 2016	0.800	Dec 2017	1.000	Dec 2018	-		1.000	Continuing	Continuing	Continuing
NGCM DEVELOPMENT 1	C/CPAF	Argon ST : Fairfax, VA	5.757	0.000		0.000		0.000		-		0.000	0.000	5.757	-
NGCM DEVELOPMENT 2	C/CPAF	Ultra : Braintree, MA	5.484	0.000		0.000		0.000		-		0.000	0.000	5.484	-
AASP SBIR Phase 2.5	SS/CPFF	HAI : Cohasset, MA	0.435	0.000		0.000		0.000		-		0.000	0.000	0.435	-
		Subtotal	39.566	6.820		11.573		10.741		-		10.741	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	NAVSEA : Washington, DC	0.612	0.080	Oct 2016	0.080	Oct 2017	0.070	Oct 2018	-		0.070	Continuing	Continuing	Continuing
PROGRAM MANAGEMENT SUPPORT	C/CPAF	TECH MARINE : Washington, DC	0.900	0.000		0.000		0.000		-		0.000	0.000	0.900	-
PROGRAM MANAGEMENT SUPPORT	C/CPAF	BOOZ ALLEN : Washington, DC	0.865	0.400	Jun 2017	0.400	Dec 2017	0.500	Dec 2018	-		0.500	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101226N / *Submarine Acoustic War Dev*	**Project (Number/Name)** 1265 / *Sub Defensive Warfare*

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	2.377	0.480		0.480		0.570		-		0.570	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	41.943	7.300		12.053		11.311		-		11.311	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101226N / *Submarine Acoustic War Dev*	**Project (Number/Name)** 1265 / *Sub Defensive Warfare*

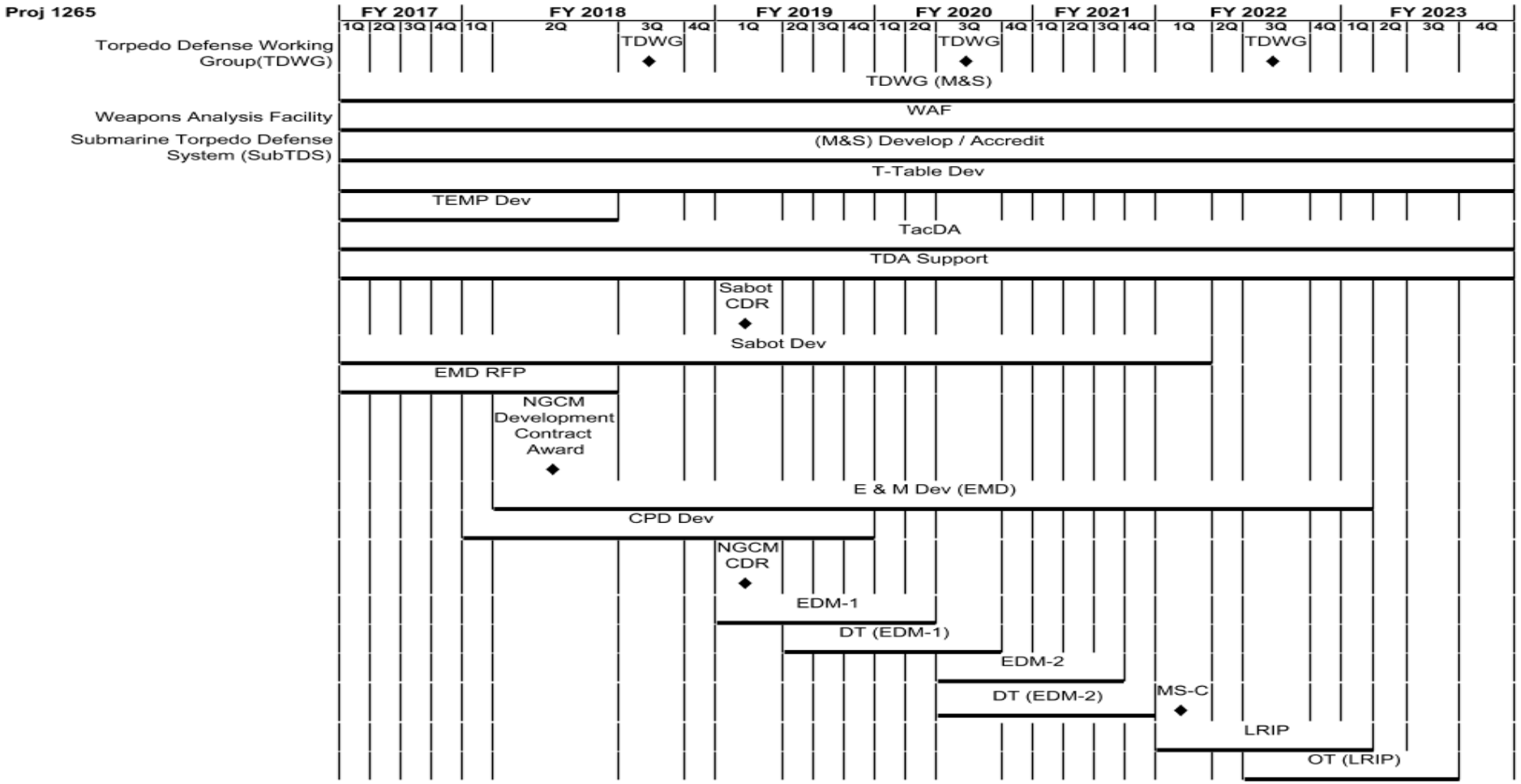
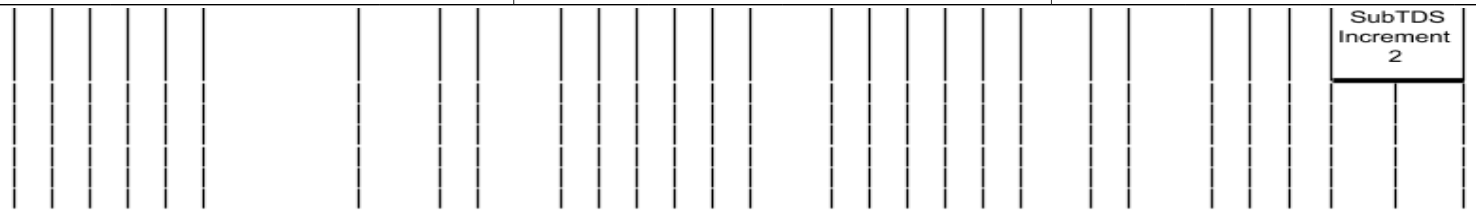


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101226N / *Submarine Acoustic War Dev*	**Project (Number/Name)** 1265 / *Sub Defensive Warfare*



2019PB - 0101226N - 1265

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101226N / *Submarine Acoustic War Dev*	**Project (Number/Name)** 1265 / *Sub Defensive Warfare*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1265				
Torpedo Defense Working Group(TDWG): FY18 TDWG	3	2018	3	2018
Torpedo Defense Working Group(TDWG): FY20 TDWG	3	2020	3	2020
Torpedo Defense Working Group(TDWG): FY22 TDWG	3	2022	3	2022
Torpedo Defense Working Group(TDWG): TDWG Modeling & Simulation (M&S)	1	2017	4	2023
Weapons Analysis Facility: COUNTERMEASURE (CM) EFFECTIVENESS/WEAPON ANALYSIS FACILITY (WAF) VULNERABILITY	1	2017	4	2023
Submarine Torpedo Defense System (SubTDS): SubTDS (M&S) Develop / Accredit	1	2017	4	2023
Submarine Torpedo Defense System (SubTDS): ADC MK5 T-Table Development	1	2017	4	2023
Submarine Torpedo Defense System (SubTDS): SubTDS TEMP Development	1	2017	2	2018
Submarine Torpedo Defense System (SubTDS): Tactical Decision Aid (TacDA)	1	2017	4	2023
Submarine Torpedo Defense System (SubTDS): Technical Direction Agent (TDA) Support	1	2017	4	2023
Submarine Torpedo Defense System (SubTDS): Sabot CDR	1	2019	1	2019
Submarine Torpedo Defense System (SubTDS): Sabot Development	1	2017	1	2022
Submarine Torpedo Defense System (SubTDS): EMD RFP	1	2017	2	2018
Submarine Torpedo Defense System (SubTDS): ADC MK5 Devlopment Contract Award	2	2018	2	2018
Submarine Torpedo Defense System (SubTDS): Engineering & Manufacturing Development (EMD)	2	2018	1	2023
Submarine Torpedo Defense System (SubTDS): ADC MK5 CPD Development	1	2018	4	2019
Submarine Torpedo Defense System (SubTDS): ADC MK5 Critical Design Review (CDR)	1	2019	1	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101226N / *Submarine Acoustic War Dev*	**Project (Number/Name)** 1265 / *Sub Defensive Warfare*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Submarine Torpedo Defense System (SubTDS): EDM-1	1	2019	2	2020
Submarine Torpedo Defense System (SubTDS): DT (EDM-1)	2	2019	3	2020
Submarine Torpedo Defense System (SubTDS): EDM-2	3	2020	3	2021
Submarine Torpedo Defense System (SubTDS): DT (EDM-2)	3	2020	4	2021
Submarine Torpedo Defense System (SubTDS): MS-C	1	2022	1	2022
Submarine Torpedo Defense System (SubTDS): LRIP	1	2022	1	2023
Submarine Torpedo Defense System (SubTDS): OT (LRIP)	3	2022	3	2023
Submarine Torpedo Defense System (SubTDS): SubTDS Increment 2	3	2023	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0101402N *I Navy Strategic Comms*							
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	468.631	16.753	18.221	39.313	-	39.313	24.334	23.971	23.369	23.740	Continuing	Continuing
1083: *Shore To Ship Com System*	199.493	15.801	17.125	29.211	-	29.211	20.320	20.189	19.572	19.926	Continuing	Continuing
3002: *Navy Strategic Comm Project*	269.138	0.952	1.096	10.102	-	10.102	4.014	3.782	3.797	3.814	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Shore to Ship Communication System develops communication elements which support Navy Nuclear Command, Control, and Communications (NC3) strategic requirements, connecting the President of the United States (POTUS) to Ballistic Missile Submarines (SSBN) via the Fixed Submarine Broadcast System (FSBS). This portfolio of programs provides design and development for shore-to-ship transmit and receive communications systems. The portfolio also designs and develops shore-to-ship communications systems (i.e., Submarine Operating Authority Command, Control, and Communications (C3) Systems) in support of tactical communications with other submarine types (i.e., SSN & SSGN).

Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS) (formerly Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC)) is modernizing the system prime mission product, the NC3 messaging software application. This software technical refresh will ensure the software meets the Message Handling Subsystem requirements and undergo operational test and evaluation. The software tech refresh will enhance the cyber security posture by complying with enhanced Information Assurance (IA) standards identified by National Security Agency (NSA).

The Navy Strategic Communications Project responds to emerging E-6B Airborne Strategic Command, Control and Communications capability requirements by performing technical evaluations, modeling and simulation, investigative ground and flight testing, enhanced software modifications and development of configuration modifications. The E-6B is a manned airborne platform that provides survivable, endurable and reliable Command, Control and Communications capability in support of the President, Secretary of Defense and United States strategic and non-strategic forces. These efforts support follow-on aircraft modification procurements necessary to ensure interoperability in information-assured network-centric strategic environments.

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 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0101402N *I Navy Strategic Comms*			
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	17.218	18.221	20.326	-	20.326
Current President's Budget	16.753	18.221	39.313	-	39.313
Total Adjustments	-0.465	0.000	18.987	-	18.987
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.441	0.000			
• Program Adjustments	0.000	0.000	16.844	-	16.844
• Rate/Misc Adjustments	0.000	0.000	2.143	-	2.143
• Congressional General Reductions Adjustments	-0.024	-	-	-	-

Change Summary Explanation

Schedule Changes for Project 1083 LBUCS Receive (V1): Delays to LBUCS Receive V1 test events and acquisition milestones are associated with system of systems integration delays. LBUCS Receive (V1) realigned its procurement and installation schedule accordingly.

Schedule Changes for Project 3002 - Upon completion of Studies & Analysis in FY16, Technical & Design Analysis and System Integration Lab Testing & Reporting will commence in FY 17 on advance technology development.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101402N / *Navy Strategic Comms*				Project (Number/Name) 1083 / *Shore To Ship Com 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**
1083: *Shore To Ship Com System*	199.493	15.801	17.125	29.211	-	29.211	20.320	20.189	19.572	19.926	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS) formerly Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC) is the shore terrestrial backbone that provides Joint assured NC3 messaging in a highly redundant and interconnected architecture for receipt, validation, storage, and forwarding of NC3 EAMs to Joint nuclear force elements. NC3 NMHS provides the Joint interface in the Navy Shore to Ship Communication System.

The Low Band Universal Communications System (LBUCS) is a modernization program that will upgrade the low-power transmit and receive subsystems of the Fixed Submarine Broadcast System (FSBS) which are approaching their operational end of life. LBUCS will ensure operational capability of the Very Low Frequency (VLF) architecture by providing system life extension and flexibility of submarine broadcast reception to submarines operating in a stealth posture. The flexibility includes enhanced throughput and anti-jam capability, ensuring more operational traffic is delivered to submarines without risking mast exposure. LBUCS will also deliver a simplified shore architecture, maintaining capability while maximizing use of shore infrastructure. Finally, LBUCS provides an upgrade to the VLF receive system, with all interoperable waveforms, to ensure continued compliance with Nuclear Command and Control System Technical Performance Criteria (NTPC). LBUCS Receive V2 extends the Very Low Frequency (VLF) receive capability to FY45 and incorporates the Unified Minimum Essential Emergency Communications (MEECN) Mode (UMM) waveforms.

The Strategic Communications Assessment Program/Continued Evaluation Program (SCAP/CEP) provides continuous assessment of the effectiveness of the Navy NC3 network and analysis of system performance in various mission locations by evaluating and reporting results of strategic exercises to the Fleet. Expanded CEP will include data from Nova hubs and Nova Information eXchange Terminals (NIXT) using automated data collection. The Navy Nuclear Command Control and Communications (NC3-N) Cyber Assessment Program (NCAP) expands cybersecurity assessments of the Navy's NC3 architecture.

The High Voltage Improvement Program (HVIP) develops technologies to improve the high voltage insulators, bushings, antenna and transmitter components used in the high-power Very Low Frequency/Low Frequency (VLF/LF) transmit systems of the Fixed Submarine Broadcast System (FSBS). These components provide Nuclear Command, Control and Communications (NC3) and are beyond their operational life expectancy.

The Broadcast Control Authority (BCA) project researches and models future solutions to address network/system interoperability, provides enterprise lab facilities and cybersecurity challenges of the four regional Submarine Operating Authority (SUBOPAUTH) BCA communication and network operations centers.

The Take Charge and Move Out (TACAMO) primary mission is to receive and retransmit Emergency Action Messages (EAMs) to US Strategic Forces. The TACAMO Ground Communications Program will acquire and sustain necessary mobile communications to support the TACAMO mission. Without this capability, there will be an increase in potential for loss of Nuclear Command, Control, and Communication (NC3) EAM delivery to the strategic forces. These mobile communications are

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*

necessary deterrence multipliers that increase the probability of strategic success. The Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT) will be employed with TACAMO teams and Submarine Groups in support of TACAMO and NC3 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: Low Band Universal Communication System (LBUCS)	7.481	4.510	8.075	0.000	8.075
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete Low Band Universal Communication System (LBUCS) Transmit development. -Complete LBUCS Receive (V1) Developmental Test (DT). -Continue LBUCS Receive (V1) development. -Continue development of statutory and regulatory acquisition documentation in preparation for LBUCS Receive (V1) deployment. -Commence LBUCS Receive (V1) DT/Operational Test (OT). -Continue the development of LBUCS Receive V2. -Commence and complete LBUCS Receive (V1) Engineering Development Model (EDM) program review.					
FY 2019 Base Plans: -Complete LBUCS Receive (V1) DT/OT. -Complete LBUCS Receive (V1) Development, and continue development of LBUCS Receive sub-modes. -Complete development of statutory and regulatory acquisition documentation in preparation for LBUCS Receive (V1) deployment. -Continue the development of LBUCS Receive V2.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: LBUCS Receive (V2) system and program development activities increase in FY19 due to planned requirements maturity in FY19 and the availability of the Unified Minimum Essential Emergency Communications (MEECN) Mode (UMM) waveform which was not previously available. This results in an increase in costs for system engineering and software development.					
Title: Strategic Communications Assessment Program (SCAP)/Continuing Evaluation Program (CEP)	4.663	4.383	6.804	0.000	6.804
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue development of automated data collection and analysis tools to reduce latency time between missions and results availability.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com 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 reports on performance, adherence to delivery time requirements and shortfalls. -Continue mission analysis of Shore and Ballistic Missile Submarine (Nuclear) (SSBN) Emergency Action Messages (EAM) reception for SSBN patrols. -Continue mission-based analysis for cyber risk on Navy Nuclear Command, Control and Communications (NC3) systems. -Continue delivery of Expanded Continuing Evaluation Program (CEP) and SSBN Patrol reports. ***FY 2019 Base Plans:*** -Continue development of automated data collection and analysis tools to reduce latency time between missions and results availability. -Continue reports on performance, adherence to delivery time requirements and shortfalls. -Continue mission analysis of Shore and SSBN EAM reception for SSBN patrols. -Continue mission-based analysis for cyber risk on Navy Nuclear Command, Control and Communications (NC3) systems. -Continue delivery of Expanded CEP and SSBN Patrol reports. -Commence NC3-N Cyber Assessment Program (NCAP). [Details held at higher classification level] -Commence NCAP reports.[Details held at higher classification level] ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY19 costs to SCAP/CEP is to establish the NC3-N Cyber Assessment Program (NCAP). In accordance with DoDI 8500.01 and DoDI 8510.01, NCAP will establish continuous cyber assessments to increase the cybersecurity posture of NC3-N systems to prevent cyber penetration by the adversary.					
Title: High Voltage Improvement Program (HVIP)	1.366	1.625	1.374	0.000	1.374
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue testing of operational scale tuning reactor. - Continue Very Low Frequency/Low Frequency (VLF/LF) environmental degradation, life span, and materials analysis. - Commence and complete study to determine most efficient and durable design for tower risers.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com 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 transmitter components analysis, testing, and specification development for the transmitter component of the Fixed Submarine Broadcast System (FSBS). ***FY 2019 Base Plans:*** - Complete testing of operational scale tuning reactor. - Continue Very Low Frequency/Low Frequency (VLF/LF) environmental degradation, life span, and materials analysis. - Continue transmitter components analysis, testing, and specification development for the transmitter component of the Fixed Submarine Broadcast System (FSBS). - Commence study to determine the probability of remote transmitter operation at Dixon. - Commence study to modernize VLF/LF propagation model. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** High Voltage Improvement Program (HVIP) reduced requirements in FY19. FY18 planned study to determine most efficient and durable design for tower risers commenced and completed which resulted in a decrease in costs for studies and design between FY18 and FY19.					
Title: Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS) formerly Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC)	1.200	3.407	4.869	0.000	4.869
Articles:	-	-	-	-	-
FY 2018 Plans: -Award NC3 NMHS Software development and Modernization contract -Commence system software development and modernization -Commence lab software/hardware integration and test -Commence developer integration, software functional assessment, and functional integration testing. -Commence engineering management oversight of software development and evaluation testing. ***FY 2019 Base Plans:*** -Continue system software modernization -Continue lab software/hardware integration and test -Continue developer integration, software functional assessment, and functional integration testing. -Continue engineering management oversight of software development and evaluation testing. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com 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 ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 OPN realigned to R&D to complete the software upgrade, integration, test for NMHS Build 2 and fielding of the Nova software. Realignment of appropriation deemed necessary to ensure proper categorization to secure software development contract. RDT&E appropriation became apparent during collaboration meeting with UNISYS, which best supports Agile Software Development. The NC3 Navy Modernized Hybrid Solution (NMHS) program is conducting an upgrade to eliminate obsolescence issues, reliance on proprietary software, and address cyber security vulnerabilities. NMHS Build 2 is the modernization of the Nova software application.					
Title: Broadcast Control Authority (BCA) ***Articles:*** ***FY 2018 Plans:*** -Continue systems and security engineering support for cybersecurity improvements. -Continue research and Model-Based Systems Engineering (MBSE) efforts to support the development and alignment of Computer Network Defense (CND) and Network Operations (NETOPS) monitoring initiatives within PEO C4I and other DoD organizations. -Complete establishment of Integrated Test Facility (ITF) and interconnectivity between other labs for end-to-end testing of Fixed Submarine Broadcast System (FSBS) Low Power and supporting C3 systems. ***FY 2019 Base Plans:*** -Continue systems and security engineering support for cybersecurity improvements. -Continue research and Model-Based Systems Engineering (MBSE) efforts to support the development and alignment of Computer Network Defense (CND) and Network Operations (NETOPS) monitoring initiatives within PEO C4I and other DoD organizations. -Commence end to end (E2E) test and evaluation of FSBS Low Power and supporting C3 systems using the ITF. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in FY19 costs to BCA is due to completion in FY18 of the establishment of Integrated Test Facility and interconnectivity between other labs for end-to-end testing of FSBS Low Power and supporting C3 systems.	1.091 -	3.200 -	3.089 -	0.000 -	3.089 -
Title: Take Charge and Move Out (TACAMO) ***Articles:***	0.000 -	0.000 -	5.000 -	0.000 -	5.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com 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: N/A ***FY 2019 Base Plans:*** -Commence the Advanced Extremely High Frequency (AEHF) Mission Planning Element (MPE) for requirements analysis and software development with the Air Force software. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY19 costs is the result of the addition of Advanced Extremely High Frequency (AEHF) Mission Planning Element (MPE) for requirements analysis and software development with the Air Force to ensure satellite acceptance of the TACAMO transmission, enabling transfer of data to include Emergency Action Messages (EAMs).					
Accomplishments/Planned Programs Subtotals	15.801	17.125	29.211	0.000	29.211

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/3107: *Submarine Broadcast*	31.068	44.669	30.897	-	30.897	57.239	61.701	61.577	38.656	Continuing	Continuing

Remarks

D. Acquisition Strategy

Low Band Universal Communications System (LBUCS): The Full Deployment Decision for Transmit is in FY18. The testing of LBUCS Receive V1 completes in FY19. The Full Fielding Program Review for Receive V1 is in FY19.

Take Charge and Move Out (TACAMO): The Mobile Advanced Extremely High Frequency (AEHF) Terminal (MAT) contract award is in FY19 and the Mission Planning Element (MPE) begins requirements analysis and software development that same year.

E. Performance Metrics

LBUCS FY19: Complete Receive (V1) Full Fielding Decision and Operational Testing.

Strategic Communications Assessment Program (SCAP)/Continuing Evaluation Program (CEP) FY19: Delivery of Expanded CEP, NC3-N Cyber Assessment Program (NCAP), and SSBN Patrol reports.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*

High Voltage Improvement (HVIP) Program FY19: Complete testing of operational scale tuning reactor.

Broadcast Control Authority (BCA) FY19: Continue research and Model-Based Systems Engineering (MBSE) efforts to support the development and alignment of Computer Network Defense (CND) and Network Operations (NETOPS) monitoring initiatives within PEO C4I and other DoD organizations. Commence end to end (E2E) testing and evaluation of FSBS Low Power and supporting C3 systems using the Integrated Test Facility (ITF).

Nuclear Command, Control, & Communications (NC3) Navy Modernized Hybrid Solution (NMHS) formerly Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC) FY19: Continue system software modernization, lab software/hardware integration & test, developer integration software functional assessment and functional integration testing.

Take Charge and Move Out (TACAMO) FY19: Complete the Mission Planning Element (MPE) requirements analysis and software development with the Air Force.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101402N / *Navy Strategic Comms*	Project (Number/Name) 1083 / *Shore To Ship Com 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
LBUCS: Systems Engineering	WR	SSC LANT : Charleston, SC	9.977	0.250	Nov 2016	0.000		0.000		-		0.000	0.000	10.227	-
LBUCS: Primary Hardware Development	WR	SSC LANT : Charleston, SC	0.356	0.113	Nov 2016	0.000		0.000		-		0.000	0.000	0.469	-
LBUCS: Systems Engineering	WR	SSC PAC : San Diego, CA	2.699	1.646	Nov 2016	0.552	Nov 2017	1.300	Nov 2018	-		1.300	Continuing	Continuing	Continuing
LBUCS: Software Development	WR	SSC PAC : San Diego, CA	5.111	0.713	Nov 2016	0.415	Nov 2017	0.877	Nov 2018	-		0.877	Continuing	Continuing	Continuing
LBUCS: Software Development (DC)	C/IDIQ	SSC PAC : San Diego, CA	1.865	1.080	Nov 2016	0.564	Nov 2017	1.459	Nov 2018	-		1.459	Continuing	Continuing	Continuing
TACAMO: Mobile AEHF Terminal (MAT) Mission Planning	MIPR	Space and Missile Systems Center : El Segundo, CA	0.000	0.000		0.000		5.000	Jun 2019	-		5.000	0.000	5.000	-
NC3 NMHS - Software Modernization	C/FPIF	Unisys Corp : Reston, VA	0.000	0.700	Dec 2017	2.900	Dec 2017	4.067	Dec 2018	-		4.067	0.399	8.066	-
Product Development Prior Years	Various	Various : Various	88.980	0.000		0.000		0.000		-		0.000	0.000	88.980	66.297
		Subtotal	108.988	4.502		4.431		12.703		-		12.703	Continuing	Continuing	N/A

Remarks

1. Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS) is formerly known as Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC)
2. LBUCS Receive (V2) system and program development activities increase in FY19 due to planned requirements maturity in FY19 and the availability of the Unified MEECN Mode (UMM) waveform. This results in an increase in costs for system engineering and software development.
3. FY19 MAT funds support classified requirements of Other Users. Details can be found at a higher classification level.

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/Program Development	WR	SSC PAC : San Diego, CA	3.315	0.066	Nov 2016	0.066	Nov 2017	0.698	Nov 2018	-		0.698	Continuing	Continuing	Continuing
LBUCS: Acquisition/ Program Development/	C/CPFF	CSA : San Diego, CA	0.000	0.200	Feb 2017	0.211	Nov 2017	0.952	Nov 2018	-		0.952	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com 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
Logistics/Information Assurance															
LBUCS: Security Engineering	C/CPFF	G2 OPS : Virginia Beach, VA	0.127	0.126	Feb 2017	0.129	Nov 2017	0.207	Nov 2018	-		0.207	Continuing	Continuing	Continuing
LBUCS: Information Assurance	WR	SSC PAC : San Diego, CA	1.567	0.120	Nov 2016	0.123	Nov 2017	0.352	Nov 2018	-		0.352	0.000	2.162	-
LBUCS: Systems Engineering	C/CPFF	G2 OPS : San Diego, CA	0.000	0.130	Nov 2016	0.167	Nov 2017	0.528	Nov 2018	-		0.528	Continuing	Continuing	Continuing
Shore to Ship: High Voltage Improvement Program (HVIP) Studies and Design	WR	SSC PAC : San Diego, CA	5.007	1.366	Nov 2016	1.290	Nov 2017	1.010	Nov 2018	-		1.010	Continuing	Continuing	Continuing
Shore to Ship: High Voltage Improvement Program (HVIP) Studies and Design	WR	SSC LANT : Charleston, SC	0.000	0.000		0.335	Nov 2017	0.364	Nov 2018	-		0.364	Continuing	Continuing	Continuing
Shore to Ship: BCA: Systems Engineering	WR	SSC LANT : Charleston, SC	0.000	1.091	Nov 2016	1.554	Nov 2017	1.469	Nov 2018	-		1.469	Continuing	Continuing	Continuing
NC3 NMHS - Technical Design Documentation	WR	SSC PAC : San Diego	0.000	0.150	May 2017	0.150	Nov 2017	0.350	Nov 2018	-		0.350	0.000	0.650	-
Support Prior Years	Various	Various : Various	17.101	0.000		0.000		0.000		-		0.000	0.000	17.101	5.592
		Subtotal	27.117	3.249		4.025		5.930		-		5.930	Continuing	Continuing	N/A

Remarks

1. Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS) is formerly known as Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC)
2. LBUCS Receive (V2) system and program development activities increase in FY19 due to planned requirements maturity in FY19 and the availability of the Unified MEECN Mode (UMM) waveform. This results in an increase in costs for information assurance, acquisition/program development, security engineering, and systems engineering.
3. Decrease in FY19 costs to BCA is due to completion of the establishment of Integrated Test Facility and interconnectivity between other labs for end-to-end testing of Fixed Submarine Broadcast System (FSBS) Low Power and supporting Command, Control and Communications (C3) systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101402N / *Navy Strategic Comms*	Project (Number/Name) 1083 / *Shore To Ship Com 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
SCAP/CEP: Strategic OP Systems Performance Evaluation	C/CPFF	APL/JHU : Baltimore, MD	41.685	4.663	Jan 2017	4.383	Jan 2018	6.804	Jan 2019	-		6.804	Continuing	Continuing	Continuing
LBUCS: System Testing	WR	COTF : Norfolk, VA	2.189	0.250	Nov 2016	0.699	Nov 2017	0.170	Nov 2018	-		0.170	Continuing	Continuing	Continuing
LBUCS: System Testing	WR	SSC PAC : San Diego, CA	4.552	1.074	Nov 2016	0.986	Nov 2017	0.287	Nov 2018	-		0.287	Continuing	Continuing	Continuing
LBUCS: System Testing	WR	JITC : Fort Huachuca, AZ	0.410	0.225	Nov 2016	0.335	Nov 2017	0.168	Nov 2018	-		0.168	Continuing	Continuing	Continuing
LBUCS: Hardware Support for Testing	WR	SSC LANT : Charleston, SC	0.112	0.929	Nov 2016	0.000		0.000		-		0.000	0.000	1.041	-
Shore to Ship: BCA Hardware Support for Testing	WR	SSC LANT : Charleston, SC	0.000	0.000		1.646	Nov 2017	1.620	Nov 2018	-		1.620	Continuing	Continuing	Continuing
NC3 NMHS - System Testing	WR	SSC PAC : San Diego	0.000	0.290	May 2017	0.290	Nov 2017	0.327	Nov 2018	-		0.327	0.000	0.907	-
		Subtotal	48.948	7.431		8.339		9.376		-		9.376	Continuing	Continuing	N/A

Remarks

1. Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS) is formerly known as Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC)
2. Increase in FY19 costs to SCAP/CEP is for NC3-N Cyber Assessment Program (NCAP).
3. Increase in FY19 costs to SCAP/CEP is to establish the NC3-N Cyber Assessment Program (NCAP). In accordance with DoDI 8500.01 and DoDI 8510.01, NCAP will establish continuous cyber assessments to increase the cybersecurity posture of NC3-N systems.

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
LBUCS: Program Management	WR	SSC PAC : San Diego, CA	9.767	0.225	Nov 2016	0.066	Nov 2017	0.570	Nov 2018	-		0.570	Continuing	Continuing	Continuing
Contractor Engineering Support	MIPR	MITRE : San Diego, CA	4.257	0.334	Nov 2016	0.197	Nov 2017	0.507	Nov 2018	-		0.507	Continuing	Continuing	Continuing
NC3 NMHS - Program Management	WR	SSC PAC : San Diego	0.000	0.060	May 2017	0.067	Nov 2017	0.125	Nov 2018	-		0.125	0.000	0.252	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com 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	0.416	0.000		0.000		0.000		-		0.000	0.000	0.416	-
		Subtotal	14.440	0.619		0.330		1.202		-		1.202	Continuing	Continuing	N/A

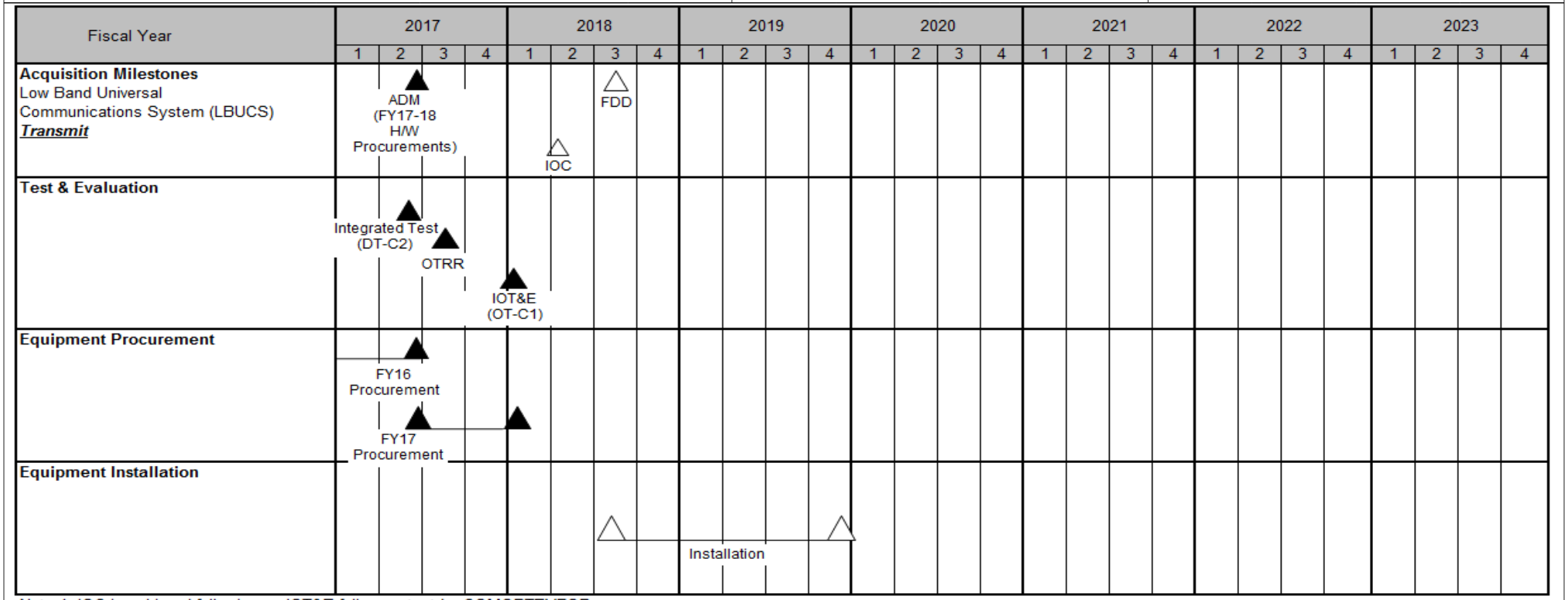
Remarks

1. Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS) is formerly known as Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC)
2. LBUCS Receive (V2) system and program development activities increase in FY19 due to planned requirements maturity in FY19 and the availability of the Unified MEECN Mode (UMM) waveform. This results in an increase in costs for program management and engineering 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	199.493	15.801		17.125		29.211		-		29.211	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*

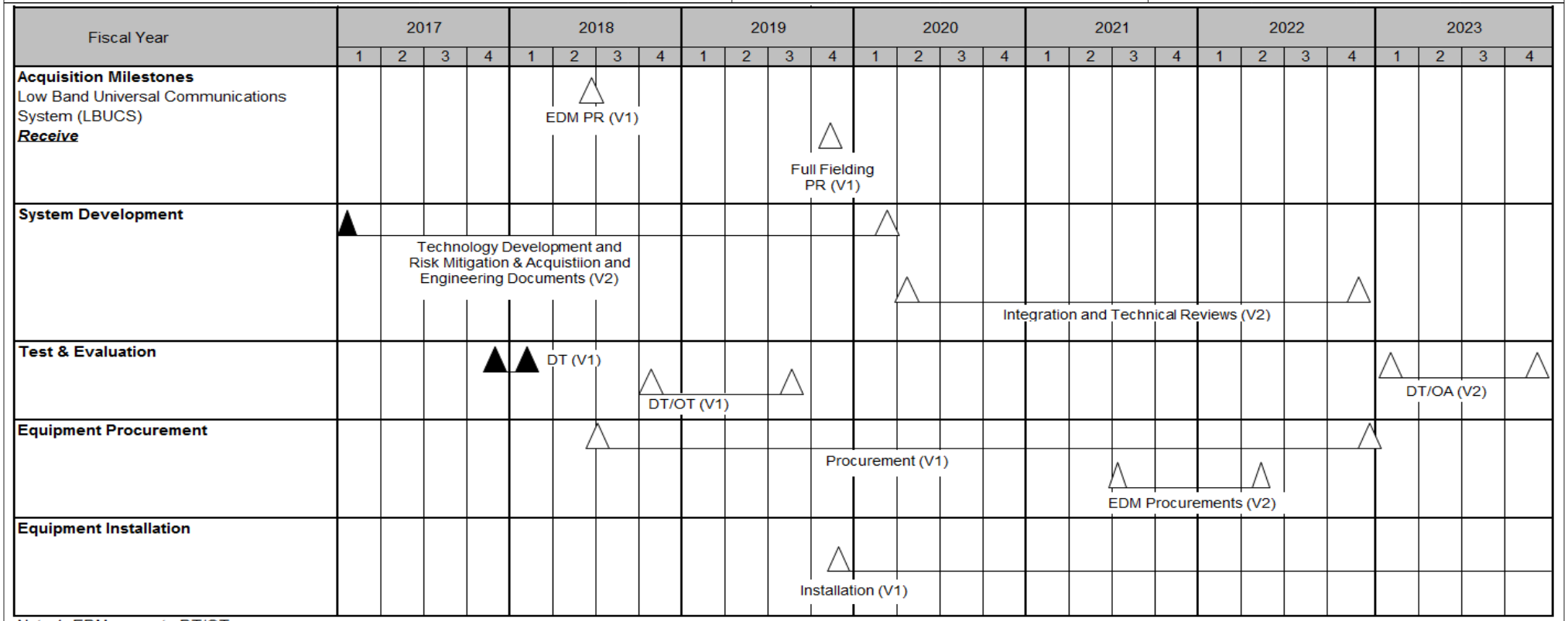


Note 1: IOC is achieved following an IOT&E follow-up test by COMOPTEVFOR.
Note 2: The ADMs provided hardware acquisition authority by Milestone Decision Authority prior to the IOT&E report.
Note 3: LBUCS Transmit equipment and cables will be installed in racks and must go through acceptance and integration testing prior to installation. Timeframe varies due to complexity of each site's unique system configuration.

Acronym Legend:

ADM: Acquisition Decision Memorandum
DT: Developmental Testing
FDD: Full Deployment Decision
IOC: Initial Operational Capability
IOT&E: Initial Operational Test and Evaluation
LRIP: Low-Rate Initial Production
OT: Operational Testing
OTRR: Operational Test Readiness Review

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*



Note 1: EDM supports DT/OT
Note 2: EDM program review will result in procurement authority.

Acronym Legend:
DT: Developmental Testing
EDM: Engineering Development Model
OA: Operational Assessment
OT: Operational Testing
PR: Program Review

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*

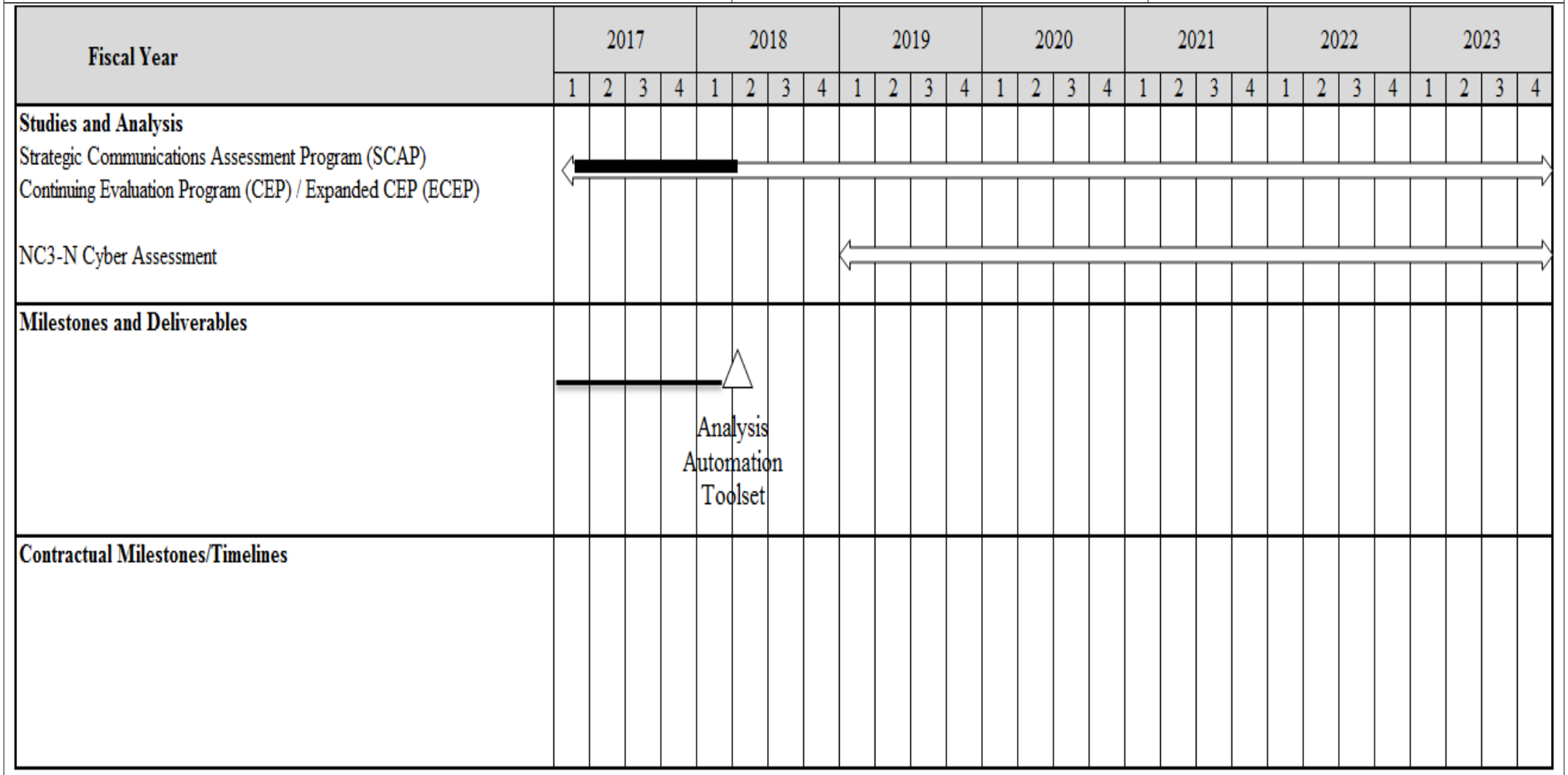
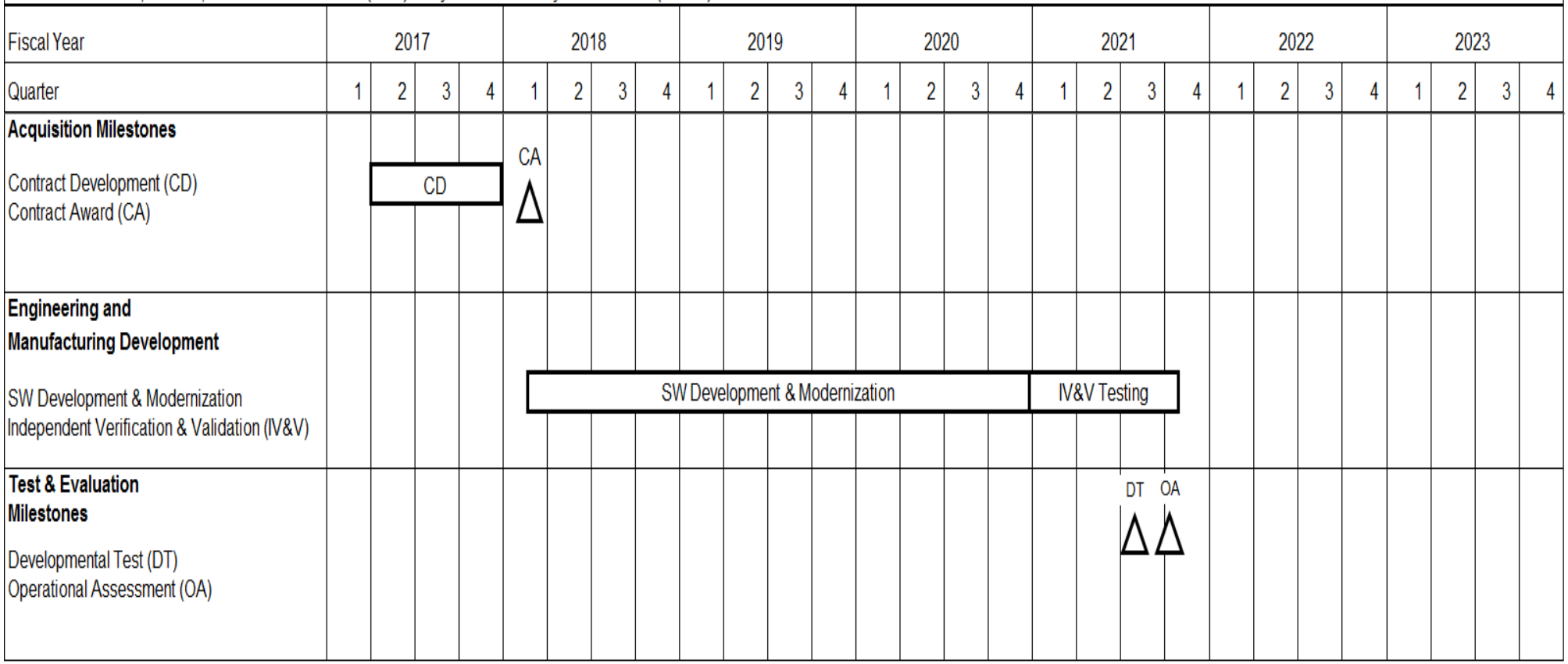


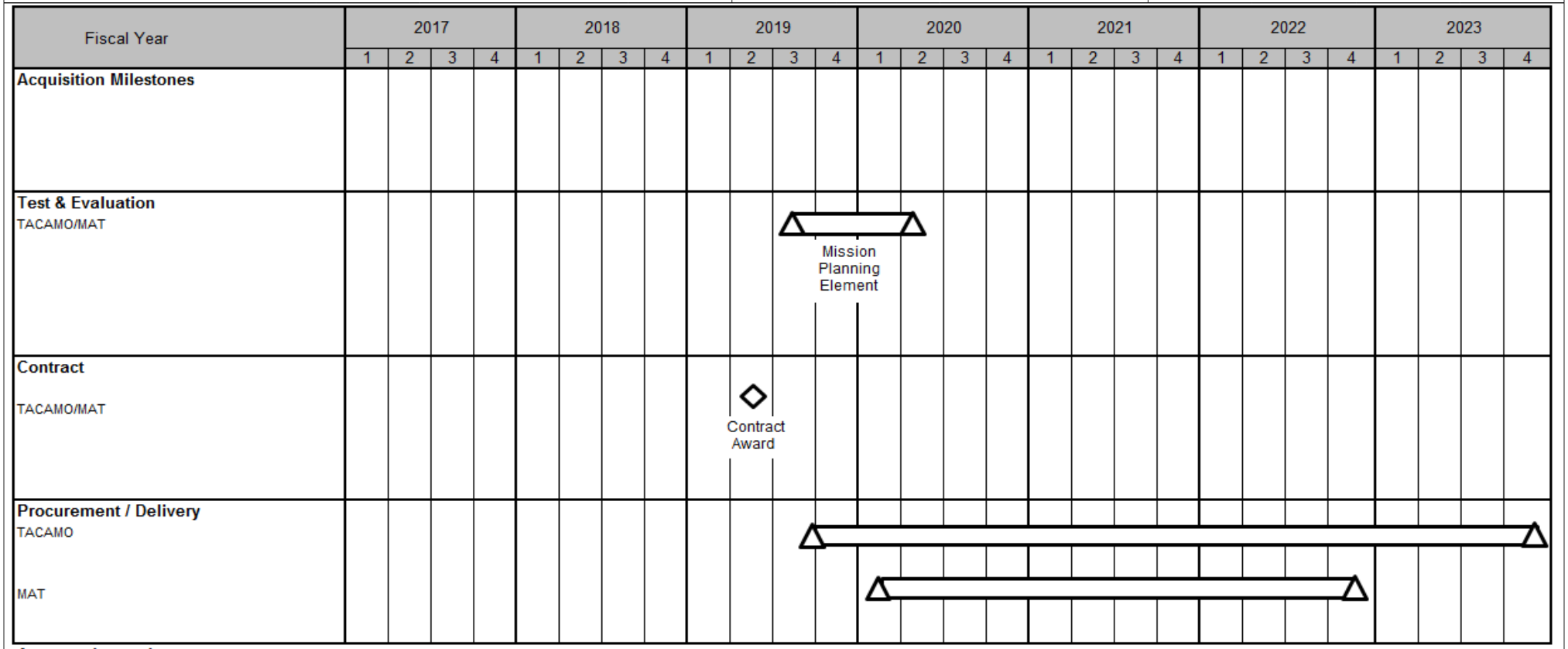
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*

Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS)



Note: Project name change to Nuclear Command, Control, and Communications (NC3) Navy Modernized Hybrid Solution (NMHS); formerly Nuclear Command, Control and Communications Nova Technical Change (NC3 NTC).
Full Operational Capability (FOC) is planned for Q3 in FY23

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*



Acronym Legend:
MAT: Mobile Advanced Extremely High Frequency (AEHF) Terminal
TACAMO: Take Charge and Move Out
Note: Mission Planning Element requirements analysis and software development cannot commence until MAT antenna characteristics are identified after MAT contract award. Mission Planning Element provides efficient network and resource allocation between the AEHF satellite constellation and the Mobile AEHF Terminal.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1083				
LBUCS: FY16 Hardware Procurement - Transmit	1	2017	2	2017
LBUCS: Integrated Test (DT-C2) - Transmit	2	2017	2	2017
LBUCS: ADM (FY17-18 H/W Procurements) - Transmit	2	2017	2	2017
LBUCS: FY17 Procurement - Transmit	2	2017	1	2018
LBUCS: Operational Test Readiness Review (OTRR) - Transmit	3	2017	3	2017
LBUCS: Operational Test (IOT&E) - Transmit	1	2018	1	2018
LBUCS: Initial Operational Capability (IOC) - Transmit	2	2018	2	2018
LBUCS: Full Deployment Decision (FDD) - Transmit	3	2018	3	2018
LBUCS: Installation - Transmit	3	2018	4	2019
LBUCS: Developmental Test (DT) - Receive (V1)	4	2017	1	2018
LBUCS: EDM Program Review - Receive (V1)	2	2018	2	2018
LBUCS: Developmental Testing/Operational Testing (DT/OT) - Receive (V1)	4	2018	3	2019
LBUCS: Full Fielding Program Review - Receive (V1)	4	2019	4	2019
LBUCS: Procurement - Receive (V1)	3	2018	4	2022
LBUCS: Installation - Receive (V1)	4	2019	4	2023
LBUCS: Technology Development and Risk Mitigation & Acquisition and Engineering Documents - Receive (V2)	1	2017	1	2020
LBUCS: Integration and Technical Reviews - Receive (V2)	2	2020	4	2022
LBUCS: EDM Procurements - Receive (V2)	3	2021	2	2022
LBUCS: Developmental Testing/Operational Assessment (DT/OA) - Receive (V2)	1	2023	4	2023
CEP: Studies and Analysis	1	2017	4	2023
CEP: NC3 Cyber Assessment	1	2019	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 1083 / *Shore To Ship Com System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
CEP: Analysis Automation	1	2017	2	2018
NC3 NMHS: Acquistion MS - Contract Development - (CD)	2	2017	4	2017
NC3 NMHS: Acquistion MS - Contract Award (CA)	1	2018	1	2018
NC3 NMHS: Engineering & Manufacturing Development - SW Development & Modernization	1	2018	4	2020
NC3 NMHS: Engineering & Manufacturing Development - Independent Verification & Validation (IV&V)	1	2021	4	2021
NC3 NMHS: Test & Evaluation MS Development - DT	3	2021	3	2021
Take Charge and Move Out (TACAMO)/Mobile AEHF Terminal (MAT): FY19 Mission Planning Element (MPE) requirements analysis and software development.	2	2019	2	2020
Mobile AEHF Terminal (MAT) - Contract Award	2	2019	2	2019
Take Charge and Move Out (TACAMO) - Procurement	3	2019	4	2023
Mobile AEHF Terminal (MAT) - Procurement	1	2020	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0101402N / *Navy Strategic Comms*				Project (Number/Name) 3002 / *Navy Strategic Comm Project*			
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**
3002: *Navy Strategic Comm Project*	269.138	0.952	1.096	10.102	-	10.102	4.014	3.782	3.797	3.814	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The E-6 is a manned airborne platform that provides survivable, endurable and reliable Command, Control and Communications capability in support of the President, Secretary of Defense and United States strategic and non-strategic forces. In order to respond effectively to emerging capability requirements, continued effort is needed to perform technical evaluations, modeling and simulation, investigative ground and flight testing, enhanced software modifications and development of configuration modifications. Funding is for operational mission analysis and hardware/software engineering required to optimize E-6 systems for cyber security and interoperability in a strategic 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: Operational System Development, Studies and Demonstrations	0.952	1.096	10.102	0.000	10.102
Articles:	-	-	-	-	-
FY 2018 Plans: Perform and conduct advanced simulations, integrations and demonstrations using the E-6B Systems Integration Laboratory and contractor assets to address system obsolescence and potential upgrades to ensure interoperability of the E-6B platform.					
FY 2019 Base Plans: Perform operational mission analyses and conduct advanced simulations, prototyping, integrations, and demonstrations using the E-6B Systems Integration Laboratory and contractor assets to address system obsolescence and potential upgrades to ensure cyber security software improvements and interoperability of the E-6B platform. E-6 Recapitalization Analysis of Alternatives (AOA).Conduct E-6 Analysis of Alternatives (AOA) assessing systems, emergent technologies, and industry Internal Research and Development (IRAD) activities / proposals that can be used across multiple mission areas to reduce risk, development time and cost. Conduct threat assessments based on current and future scenarios and environments to inform performance requirements and relevant technology.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 3002 / *Navy Strategic Comm Project*

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 increase is due to upgrades to ensure E-6 cyber security software improvements and E-6 Recapitalization AoA.					
Accomplishments/Planned Programs Subtotals	0.952	1.096	10.102	0.000	10.102

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 056400: *E-6 Series*	194.998	223.508	180.021	-	180.021	207.540	186.360	152.150	126.920	302.081	2,865.651

Remarks

D. Acquisition Strategy

"Research, Development, Test & Evaluation, Navy (RDT&E,N) funds continuing efforts to perform technical evaluations, modeling & simulation and investigative ground and flight testing. Aircraft Procurement, Navy, Modification of Aircraft (APN-5) funds integration, procurement and installation of aircraft modifications."

E. Performance Metrics

Mission Systems Evaluation; E-6 Recapitalization Analysis of Alternatives 3rd Qtr FY19, Technical Analysis 1st Qtr FY19, Design Analysis 2nd Qtr FY19, Systems Integration Lab (SIL) Test and Reporting 3rd Qtr FY19.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101402N / *Navy Strategic Comms*	Project (Number/Name) 3002 / *Navy Strategic Comm Project*	

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 Production Development no longer funded in the FYDP	Various	Various : Various	195.224	0.000		0.000		0.000		-		0.000	0.000	195.224	-
Production Development Support	Various	Various : Various	0.000	0.000		0.000		0.961	Nov 2018	-		0.961	0.000	0.961	-
		Subtotal	195.224	0.000		0.000		0.961		-		0.961	0.000	196.185	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 & Analyses	Various	Various: : Various	5.444	0.808	Nov 2016	0.760	Nov 2017	2.021	Nov 2018	-		2.021	Continuing	Continuing	Continuing
E-6 Recapitalization Analysis of Alternatives	Various	Various : Various	0.000	0.000		0.000		6.100	Apr 2019	-		6.100	0.000	6.100	-
		Subtotal	5.444	0.808		0.760		8.121		-		8.121	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
Prior Year Test & Evaluation cost no longer funded in the FYDP	Various	Various : Various	6.461	0.000		0.000		0.000		-		0.000	0.000	6.461	-
		Subtotal	6.461	0.000		0.000		0.000		-		0.000	0.000	6.461	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	13.996	0.000		0.085	Nov 2017	0.413	Nov 2018	-		0.413	Continuing	Continuing	Continuing
Governmental Support	Various	Various : various	35.003	0.000		0.076	Nov 2017	0.432	Nov 2018	-		0.432	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0101402N / *Navy Strategic Comms*	Project (Number/Name) 3002 / *Navy Strategic Comm Project*	

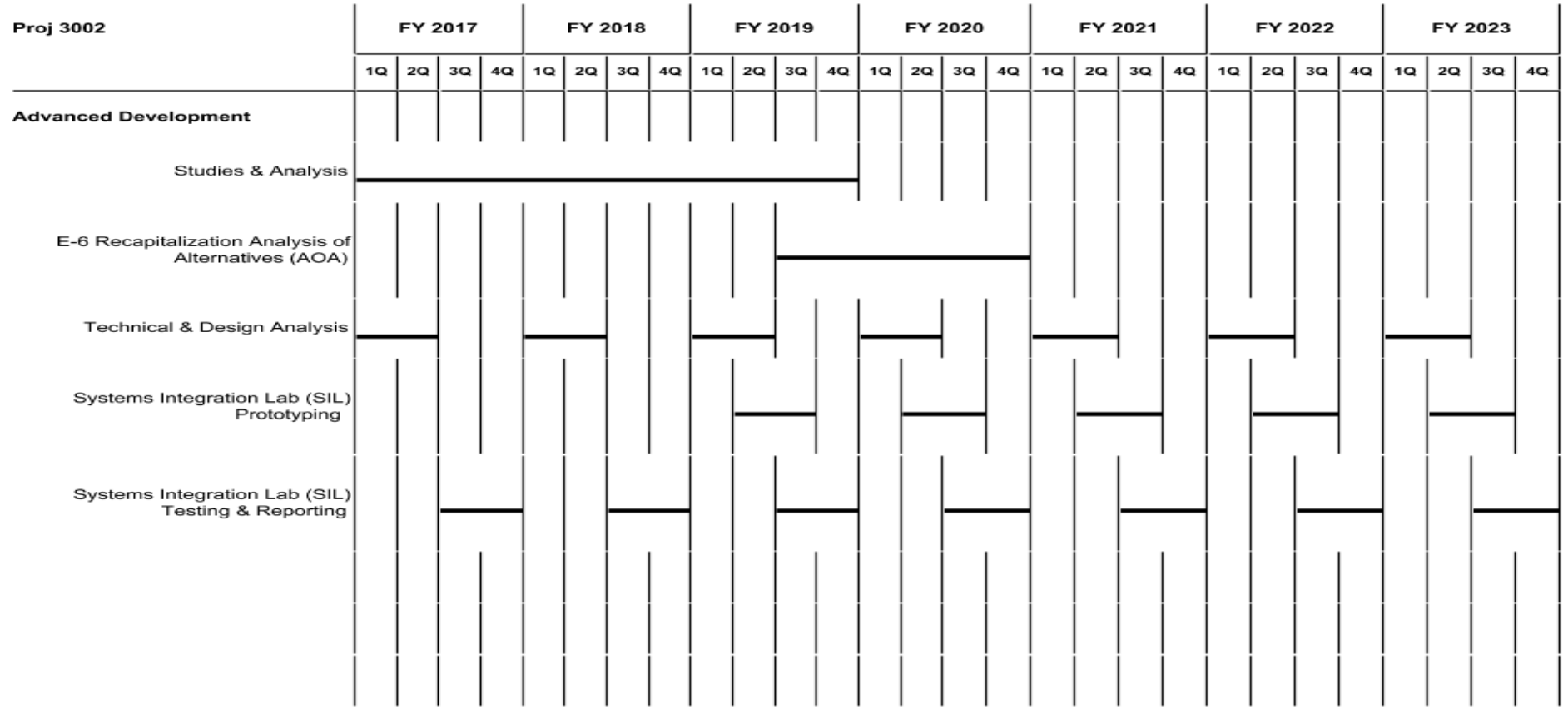
Management Services ($ in Millions)

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	NAVAIR HQ : Patuxent River, MD	2.412	0.144	Oct 2016	0.175	Oct 2017	0.175	Oct 2018	-		0.175	Continuing	Continuing	Continuing
Prior Year Management cost no longer funded in the FYDP	Various	Various : Various	10.598	0.000		0.000		0.000		-		0.000	0.000	10.598	-
		Subtotal	62.009	0.144		0.336		1.020		-		1.020	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	269.138	0.952		1.096		10.102		-		10.102	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 3002 / *Navy Strategic Comm Project*



2019PB - 0101402N - 3002

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 3002 / *Navy Strategic Comm Project*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3002				
Advanced Development: Studies & Analysis: Studies & Analysis	1	2017	4	2019
Advanced Development: E-6 Recapitalization Analysis of Alternatives (AOA): Analysis of Alternatives (AOA) (FY19) (This needs to be a separate Project Unit)	3	2019	4	2020
Advanced Development: Technical & Design Analysis: Technical & Design Analysis (FY17)	1	2017	2	2017
Advanced Development: Technical & Design Analysis: Technical & Design Analysis (FY18)	1	2018	2	2018
Advanced Development: Technical & Design Analysis: Technical & Design Analysis (FY19)	1	2019	2	2019
Advanced Development: Technical & Design Analysis: Technical & Design Analysis (FY20)	1	2020	2	2020
Advanced Development: Technical & Design Analysis: Technical & Design Analysis (FY21)	1	2021	2	2021
Advanced Development: Technical & Design Analysis: Technical & Design Analysis (FY22)	1	2022	2	2022
Advanced Development: Technical & Design Analysis: Technical & Design Analysis (FY23)	1	2023	2	2023
Advanced Development: Systems Integration Lab (SIL) Prototyping: Systems Integration Lab (SIL) Prototyping (FY19)	2	2019	3	2019
Advanced Development: Systems Integration Lab (SIL) Prototyping: Systems Integration Lab (SIL) Prototyping (FY 20)	2	2020	3	2020
Advanced Development: Systems Integration Lab (SIL) Prototyping: Systems Integration Lab (SIL) Prototyping (FY21)	2	2021	3	2021
Advanced Development: Systems Integration Lab (SIL) Prototyping: Systems Integration Lab (SIL) Prototyping (FY22)	2	2022	3	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0101402N / *Navy Strategic Comms*	**Project (Number/Name)** 3002 / *Navy Strategic Comm Project*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Advanced Development: Systems Integration Lab (SIL) Prototyping: Systems Integration Lab (SIL) Prototyping (FY23)	2	2023	3	2023
Advanced Development: Systems Integration Lab (SIL) Testing & Reporting: SIL Testing & Reporting (FY17)	3	2017	4	2017
Advanced Development: Systems Integration Lab (SIL) Testing & Reporting: SIL Testing & Reporting (FY18)	3	2018	4	2018
Advanced Development: Systems Integration Lab (SIL) Testing & Reporting: SIL Testing & Reporting (FY19)	3	2019	4	2019
Advanced Development: Systems Integration Lab (SIL) Testing & Reporting: SIL Testing & Reporting (FY20)	3	2020	4	2020
Advanced Development: Systems Integration Lab (SIL) Testing & Reporting: SIL Testing & Reporting (FY21)	3	2021	4	2021
Advanced Development: Systems Integration Lab (SIL) Testing & Reporting: SIL Testing & Reporting (FY22)	3	2022	4	2022
Advanced Development: Systems Integration Lab (SIL) Testing & Reporting: SIL Testing & Reporting (FY23	3	2023	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204136N *I F/A-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	5,041.259	169.473	224.470	193.086	-	193.086	170.095	116.368	84.070	87.836	Continuing	Continuing
1662: *F/A-18 Improvement*	4,293.409	62.601	69.759	102.938	-	102.938	72.980	77.428	75.111	78.695	Continuing	Continuing
2065: *F/A-18 Radar Upgrade*	726.534	10.844	8.018	7.002	-	7.002	8.773	8.782	8.959	9.141	Continuing	Continuing
2069: *F/A-18 Infrared Search and Track (IRST)*	0.000	94.094	86.993	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	181.087
2071: *F/A-18 Block III*	0.000	0.000	59.700	83.146	-	83.146	88.342	30.158	0.000	0.000	0.000	261.346
9999: *Congressional Adds*	21.316	1.934	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.250
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** P510												

A. Mission Description and Budget Item Justification

The F/A-18 is required to perform multiple missions. Capabilities of the F/A-18 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. Continued F/A-18 E/F and EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Super Hornet next generation mission system capability and maintaining tactical relevance in support of Navy Aviation Plan 2030. Development continues for a platform solution to threat Advanced Electronic Attack and Counter-Electronic Attack (CEA). F/A-18 solutions to CEA include upgrades to existing sensors such as F/A-18 Radar Upgrade, Infrared Search and Track Block I/II, and development of a fused picture between these sensors. Additionally, 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.

Future integrated Carrier Air Wing CONOPS demand certain changes to the base line Block II Super Hornet. In response, the Block III Super Hornet is submitted. While none of the changes to the aircraft are considered revolutionary, the combined impact to the capability of the aircraft and its contribution to the Airwing are significant. The initial F/A-18 Block III concept includes low risk changes which can be incorporated in the near term with a combination of forward fit production line incorporation and via retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan. The FY19 budget request funds Non-Recurring (NRE) for these ECPs.

Congressional add support of an engine noise reduction study. The University of Mississippi (UofM)/National Center for Physical Acoustics (NCPA) is conducting the study.

Funding is added for transition ONR FNC Strike Accelerator developed target (AITR) algorithms which is part of Integrated Capabilities Package 3 (ICP-3). ICP-3 bring advanced capability required to keep the aircraft relevant and meet current and future threats.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204136N *I F/A-18 Squadrons*

Funding is added for Naval Aviation Physiological Episode (PE) mitigation and root cause investigation in aircraft.

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. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	189.125	224.470	286.160	-	286.160
Current President's Budget	169.473	224.470	193.086	-	193.086
Total Adjustments	-19.652	0.000	-93.074	-	-93.074
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-4.920	0.000			
• Program Adjustments	0.000	0.000	19.700	-	19.700
• Rate/Misc Adjustments	0.000	0.000	-112.774	-	-112.774
• Congressional General Reductions Adjustments	-0.032	-	-	-	-
• Congressional Directed Reductions Adjustments	-16.700	-	-	-	-
• Congressional Add Adjustments	2.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Noise Reduction*	1.934	0.000
Congressional Add Subtotals for Project: 9999	1.934	0.000
Congressional Add Totals for all Projects	1.934	0.000

Change Summary Explanation

Technical:
1662: ICPS AITR capability funding is included with the 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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204136N *I F/A-18 Squadrons*

Physiological Episode Mitigation funding is included with the budget.

2065: Not Applicable

2069: Not Applicable

2071: Block III request for F/A-18E/F capability upgrades Non-recurring Engineering (NRE) funding is included with the budget.

Schedule:
1662: MSI program schedule was changed to reflect program execution.

Physiological Episode Mitigation was added to reflect program execution.

2065: Not Applicable

2069: Not Applicable

2071: Block III request for F/A-18E/F capability upgrades Non-recurring Engineering (NRE) funding is included with the budget.

The FY 2019 funding request was reduced by $3.086 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.

The FY2019 funding request was reduced by $108.7M due to a transfer to Program Element 0604014N F/A-18 Infrared Search and Track (IRST) PU 2069.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 1662 / *F/A-18 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
1662: *F/A-18 Improvement*	4,293.409	62.601	69.759	102.938	-	102.938	72.980	77.428	75.111	78.695	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The F/A-18 is a multi-mission strike fighter aircraft that is used in Air-to-Air, strike, surveillance, reconnaissance and tanking roles through selected use of external equipment (fuel tanks, tactical and reconnaissance pods, and various ordnance launching racks). Additional capabilities are required for interoperability in a network-centric tactical environment. In order to respond effectively to emerging future threats, F/A-18 aircraft capabilities are being expanded and upgraded to incorporate new/enhanced weapons systems and avionics including Dual Mode Weapons, Counter-Electronic Attack (CEA), Infra-red Search and Track (IRST) integrated with the Active Electronically Scanned Array (AESA) Radar to provide Narrow Band High Gain Electronic Attack and Multi-System Integration. Continued advanced development engineering and analysis of hardware/software is required to successfully optimize fleet F/A-18 weapon systems for interoperability in a network centric tactical environment (such as Naval Integrated Fire Control-Counter Air), to include: enhanced software capabilities, potential new hardware development, enhanced existing hardware, and enhanced network centric capabilities. Additionally, continued effort is needed to perform technical evaluations, modeling and simulations, investigative flight testing, enhanced software modifications based on reported fleet deficiencies and the development and testing of design modifications to address obsolescence issues with the F/A-18 weapon system and ancillary equipment. This funding line continues F/A-18E/F "Flight Plan" spiral capability development, to include Multi-System Integration and further Flight Plan Engineering and System Configuration Set development and integration. This budget continues funding for F/A-18A-F Test Wing Maintenance support and funds development efforts needed for integration of air launched laser guided rockets on F/A-18 A+/C/D.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Multi-System Integration	31.089	49.148	39.891	0.000	39.891
Articles:	-	-	-	-	-
Description: Multi-System Integration migrates from the previous Multi-Sensor Integration Phased approach and allows for insertion of new technologies and requirements to keep pace with rapidly evolving warfighter demands. Also, includes a naming convention change in regards to System Configuration Set (SCS) builds 27 and 29. Initially all "X" labeled builds to include Block I Super Hornets, now 27 and 29 will no longer include Super Hornets thus going back to a "C" SCS label designation to include only legacy A-D aircraft.					
FY 2018 Plans: Flight Plan Multi-System Integration (MSI) of capabilities continues through mission computer, Joint Mission Planning System Unique Planning Component (JMPS UPC), and weapon system software System Configuration Set (SCS) updates associated with each incremental Block (H build) software update to include Software Modernization and Cyber. Advances in Super Hornet Air and Surface Warfare will continue with ongoing integration of weapons and sensors into a Common Tactical Picture (CTP), Display Improvements					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
to enhance air-to-air and air-to-surface situational awareness and aircrew decision superiority, and Counter Electronic Attack enhancements to improve survivability and lethality. Increased engineering efforts for integration of active and passive kill chain capabilities and sensors associated with Flight Plan Naval Integrated Fire Control-Counter Air (NIFC-CA), Over the Horizon Anti-Surface Warfare (OASuW) and Strike Accelerator Future Naval Capability (FNC) Target Identification transition efforts continues. MSI algorithm and sensor developmental efforts also increase at test activities, including ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, and Live Virtual Constructive developmental efforts. Increased Test and Evaluation funding in FY18 provides funding to Commander Operational Test Forces (COTF) for MSI Operational Test (OT). Over the Horizon Anti-Surface Warfare (OASuW) and Strike Accelerator Future Naval Capability (FNC)efforts are noted in the MSI line, and funding was provided specifically for these projects.					
FY 2019 Base Plans: Flight Plan Multi-System Integration (MSI) of capabilities continues through mission computer, Joint Mission Planning System Unique Planning Component (JMPS UPC), and weapon system software System Configuration Set (SCS) updates associated with each incremental Block (H build) software update to include Software Modernization and Cyber. Advances in Super Hornet Air and Surface Warfare will continue with ongoing integration of weapons and sensors into a Common Tactical Picture (CTP), Display Improvements to enhance air-to-air and air-to-surface situational awareness and aircrew decision superiority, and Counter Electronic Attack enhancements to improve survivability and lethality. Increased engineering efforts for integration of active and passive kill chain capabilities and sensors associated with Flight Plan Naval Integrated Fire Control-Counter Air (NIFC-CA), Over the Horizon Anti-Surface Warfare (OASuW) and Strike Accelerator Future Naval Capability (FNC) Target Identification transition efforts continues. MSI algorithm and sensor developmental efforts also increase at test activities, including ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, and Live Virtual Constructive developmental efforts. Increased Test and Evaluation funding in FY19 provides funding to Commander Operational Test Forces (COTF) for MSI Operational Test (OT).					
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 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY 2019 funding request was reduced by $9.257 million due H14 MSI development entering OT and efforts for the next phase of MSI, labeled Common Tactical Picture (CTP) Phase I, beginning its ramp up effort for inclusion in H18.					
Title: Flight Plan Engineering / System Configuration Set Development and Integration	25.706	18.011	32.397	0.000	32.397
Articles:	-	-	-	-	-
Description: Continue F/A-18 E/F and EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Super Hornet 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:*** Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy, Software Modernization and Cyber, Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance F/A-18 Cooperative Engagement Capability. Funding supports (hardware and software), test and integration efforts for Flight Plan requirements such as 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; Tactical Targeting Network Technology internet protocol capability; Flight Path Control (Magic Carpet); Advanced Targeting Forward Looking Infrared modernization and obsolescence mitigation efforts; and Precision Approach and Landing Capability, in support of Integrated Capability Package 2 and 3. ***FY 2019 Base Plans:*** Continue Flight Plan Engineering efforts to include F/A-18E/F improvements necessary for Super Hornet relevance and tactical supremacy, Software Modernization and Cyber, Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance F/A-18 Cooperative Engagement Capability. Increase in FY19 is due to incorporating AESA Multiple Target Tracking Algorithm & Tracking Confirmation, and transitions ONR FNC Strike Accelerator developed target recognition (AiTR) algorithms. Funding supports (hardware and software), test and integration efforts for Flight Plan requirements such as 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; Tactical Targeting Network Technology internet protocol capability; Flight Path Control (Magic Carpet); Advanced Targeting					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Forward Looking Infrared modernization and obsolescence mitigation efforts; and Precision Approach and Landing Capability, in support of Integrated Capability Package 2 and 3. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding request was increased by $14.386 million for transition of ONR FNC Strike Accelerator developed target (AITR) algorithms which is part of Integrated Capabilities Package 3 (ICP-3). ICP-3 bring advanced capability required to keep the aircraft relevant and meet current and future threats.					
Title: Physiological Episode Mitigation ***Articles:*** ***Description:*** Funding provides for design, development, integration and test of platform improvements for F/A-18A-F and EA-18G Weapon Systems to include Naval Aviation Physiological Episode (PE) mitigation and root cause investigation in aircraft (F/A-18A-F and EA-18G). ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Continue studies & development efforts for platform improvements for F/A-18A-F and EA-18G Weapon Systems, including F/A-18 and EA-18G PE mitigation and root cause investigation. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was increased by $28 million due to platform improvements to the F/A-18 and EA-18G for PE mitigation and root cause investigation.	0.000 -	0.000 -	28.000 -	0.000 -	28.000 -
Title: Test Wing Maintenance Conversion ***Articles:*** ***Description:*** Funding supports maintenance of aircraft at NAVAIR Test Wing used to support Program Office objectives. ***FY 2018 Plans:***	4.806 -	2.500 -	2.550 -	0.000 -	2.550 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Perform aircraft maintenance on Test Wing aircraft. ***FY 2019 Base Plans:*** Perform aircraft maintenance on Test Wing aircraft. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 funding request was increased by $0.05 million for increased support for aircraft maintenance of F/A-18 test wing aircraft.					
Title: F/A-18 Obsolescence Redesign	1.000	0.100	0.100	0.000	0.100
Articles:	-	-	-	-	-
Description: Develop and test modifications to address obsolescence issues. ***FY 2018 Plans:*** Develop and test design modifications to hardware components and software systems in response to F/A-18 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 F/A-18 weapon system and ancillary equipment obsolescence issues. ***FY 2019 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	62.601	69.759	102.938	0.000	102.938

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/0525: *F-18 SERIES*	999.424	943.661	1,213.482	-	1,213.482	1,350.530	1,364.484	1,360.496	1,714.989	7,939.984	25,104.766
• RDTEN/3063: *EA-18G DEVELOPMENT*	100.825	173.488	147.419	-	147.419	159.472	159.966	129.280	108.238	Continuing	Continuing
• APN/0145: *FA-18E/F*	1,146.912	1,200.146	1,990.524	-	1,990.524	1,929.651	1,948.066	1,731.992	1,663.687	0.000	55,476.794
• APN/0145C: *FA-18E/F*	0.000	52.971	58.799	-	58.799	62.499	54.828	41.150	0.000	0.000	270.247

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

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 F/A-18 Improvement program consists of extensive spiral development efforts mapped out in the capability-based approach F/A-18 E/F "Flight Plan." These efforts are critical to the baseline of the Super Hornet next generation mission system capability and maintaining tactical relevance in support of Navy Aviation Plan 2030. The major programs within the F/A-18 Improvement project are based on six Weapon System Capabilities: Net Centric Operations/Battle Space Management, Sensor Integration, Air to Ground and Maritime Attack, and Air to Air Attack. The major efforts included in this project are: Dual Mode Weapons integration; Multi-System Integration; continued advanced development and F/A-18E/F Flight Plan engineering and analysis; continued enhanced software capabilities development; and engineering support to perform technical evaluations, modeling and simulations, and investigative flight testing.

- Multi-System Integration. Multi-System Integration development is provided on a sole source cost plus fixed fee contract on a Research and Development Basic Ordering Agreement to Boeing.

E. Performance Metrics

Execute the system engineering process for software delivery and support the design, development, integration, and sensor fusion of the contributing systems for MSI capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 1662 / *F/A-18 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
Multi System Integration - Develop Sensor Integration	C/IDIQ	Various : Various	1.500	8.465	Feb 2017	15.157	Feb 2018	17.387	Feb 2019	-		17.387	Continuing	Continuing	Continuing
Multi-System Integration Development Support	WR	NAWCWD : China Lake, CA	0.000	13.500	Dec 2016	14.953	Dec 2017	17.895	Dec 2018	-		17.895	0.000	46.348	-
Multi-System Integration Development Support	WR	NAWCAD : Pax River, MD	0.000	5.000	Dec 2016	7.159	Dec 2017	10.508	Dec 2018	-		10.508	0.000	22.667	-
Physiological Epidsode Mitigation- Development	TBD	Various : Various	0.000	0.000		0.000		24.500	Jan 2019	-		24.500	0.000	24.500	24.500
Flight Plan / PALC(WAAS)	C/CPFF	Boeing : St. Louis, MO	3.650	3.664	Jul 2017	3.188	Aug 2018	2.451	Dec 2018	-		2.451	0.000	12.953	12.953
Flight Plan/SCS Development	WR	NAWCAD : Pax River, MD	6.151	5.496	Dec 2016	1.000	Dec 2017	1.020	Dec 2018	-		1.020	0.000	13.667	-
Flight Plan/SCS Development (Magic Carpet)	C/CPIF	Boeing : St. Louis, MO	7.433	9.264	Dec 2016	4.500	Dec 2017	4.000	Dec 2018	-		4.000	0.000	25.197	25.197
Flight Plan/SCS Development	Various	DMEA : Various	0.000	0.000		4.600	Dec 2017	2.193	Dec 2018	-		2.193	0.000	6.793	-
ATFLIR Modernization	TBD	Various : Various	0.000	0.740	Jul 2017	0.000		0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
Prior Year Prod Dev cost no longer funded in FYDP	Various	Various : Various	774.426	0.000		0.000		0.000		-		0.000	0.000	774.426	-
		Subtotal	793.160	46.129		50.557		80.054		-		80.054	Continuing	Continuing	N/A

Remarks

FY19 Multi-System Integration development efforts increased due to Strike Accelerator requirements.

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
Multi-System Integration Development Support	WR	NSMA : Arlington, VA	4.600	2.300	Mar 2017	1.679	Mar 2018	1.713	Mar 2019	-		1.713	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 1662 / *F/A-18 Improvement*

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
Physiological Epidsode Mitigation- Support	Various	Various : Various	0.000	0.000		4.100	Feb 2018	2.500	Dec 2018	-		2.500	6.000	12.600	-
Flight Plan/System Configuration Set Development & Integration	WR	NAWCAD : Pax River, MD	3.063	2.714	Nov 2016	0.350	Nov 2017	0.307	Nov 2018	-		0.307	Continuing	Continuing	Continuing
ATFLIR Modernization - Development Support	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.050	Nov 2018	-		0.050	Continuing	Continuing	Continuing
Obsolescence Redesign	Various	Various : Various	0.900	1.000	Jun 2017	0.100	Jun 2018	0.100	Jun 2019	-		0.100	Continuing	Continuing	Continuing
Prior Year Support costs no longer funded in FYDP	Various	Various : Various	3,106.545	0.000		0.000		0.000		-		0.000	0.000	3,106.545	-
		Subtotal	3,115.108	6.014		6.229		4.670		-		4.670	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
Multi-System Integration	WR	OPTEVFOR : Norfolk, VA	1.461	0.000		5.100	Dec 2017	10.102	Dec 2018	-		10.102	Continuing	Continuing	Continuing
Physiological Epidsode Mitigation- Test & Evaluation	WR	NMRC : Silver Spring, MD	0.000	0.200	Sep 2017	1.000	Jan 2018	1.000	Dec 2018	-		1.000	1.000	3.200	-
Flight Plan/SCS Test & Evaluation	WR	NAWCAD : Pax River, MD	1.000	1.000	Dec 2016	0.000		0.000		-		0.000	0.000	2.000	-
ATFLIR Modernization - Developmental Test	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		0.100	Nov 2018	-		0.100	Continuing	Continuing	Continuing
Prior Year T&E costs no longer funded in FYDP	Various	Various : Various	192.414	0.000		0.000		0.000		-		0.000	0.000	192.414	-
		Subtotal	194.875	1.200		6.100		11.202		-		11.202	Continuing	Continuing	N/A

Remarks

MSI increase from FY18 to FY19 is due operational test. Start of H14 (MSI large portion) operational test taking place in FY19

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 1662 / *F/A-18 Improvement*	

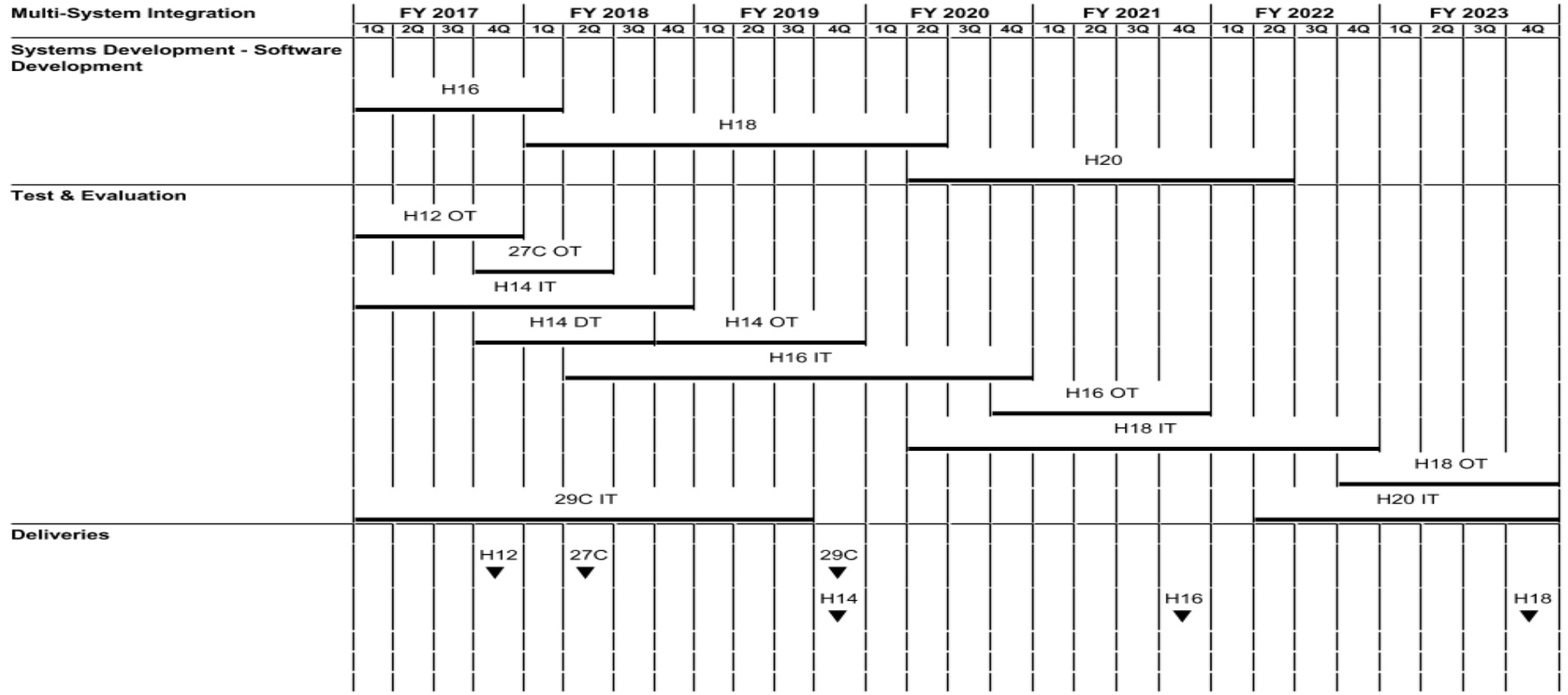
Management Services ($ in Millions)

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
Program Mgmt Support - MISC	Various	NAWCAD : Pax River, MD	16.305	0.659	Dec 2016	0.659	Dec 2017	0.672	Dec 2018	-		0.672	Continuing	Continuing	Continuing
Seaport CSS - Program Management Support	C/CPFF	Wyle Lab : Pax River, MD	24.766	2.626	Dec 2016	2.603	Dec 2017	2.655	Dec 2018	-		2.655	0.000	32.650	32.650
Travel	Various	NAVAIR : Pax River, MD	5.423	0.250	Nov 2016	0.250	Nov 2017	0.255	Dec 2018	-		0.255	Continuing	Continuing	Continuing
Test Wing Maintenance Conversion	WR	NAWCAD : Pax River, MD	32.580	2.403	Dec 2016	1.250	Dec 2017	1.275	Dec 2018	-		1.275	Continuing	Continuing	Continuing
Test Wing Maintenance Conversion	WR	NAWCWD : China Lake, CA	33.506	2.403	Dec 2016	1.250	Dec 2017	1.275	Dec 2018	-		1.275	Continuing	Continuing	Continuing
Flight Plan / System Configuration Set Development & Integration	WR	NAWCAD : Pax River, MD	6.350	0.459	Dec 2016	0.431	Dec 2017	0.440	Dec 2018	-		0.440	Continuing	Continuing	Continuing
Flight Plan / System Configuration Set Development & Integration	WR	NAWCWD : China Lake, CA	6.350	0.458	Dec 2016	0.430	Dec 2017	0.440	Dec 2018	-		0.440	Continuing	Continuing	Continuing
Prior Year Mgmt costs no longer funded in FYDP	Various	Various : Various	64.986	0.000		0.000		0.000		-		0.000	0.000	64.986	-
		Subtotal	190.266	9.258		6.873		7.012		-		7.012	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	4,293.409	62.601		69.759		102.938		-		102.938	Continuing	Continuing	N/A

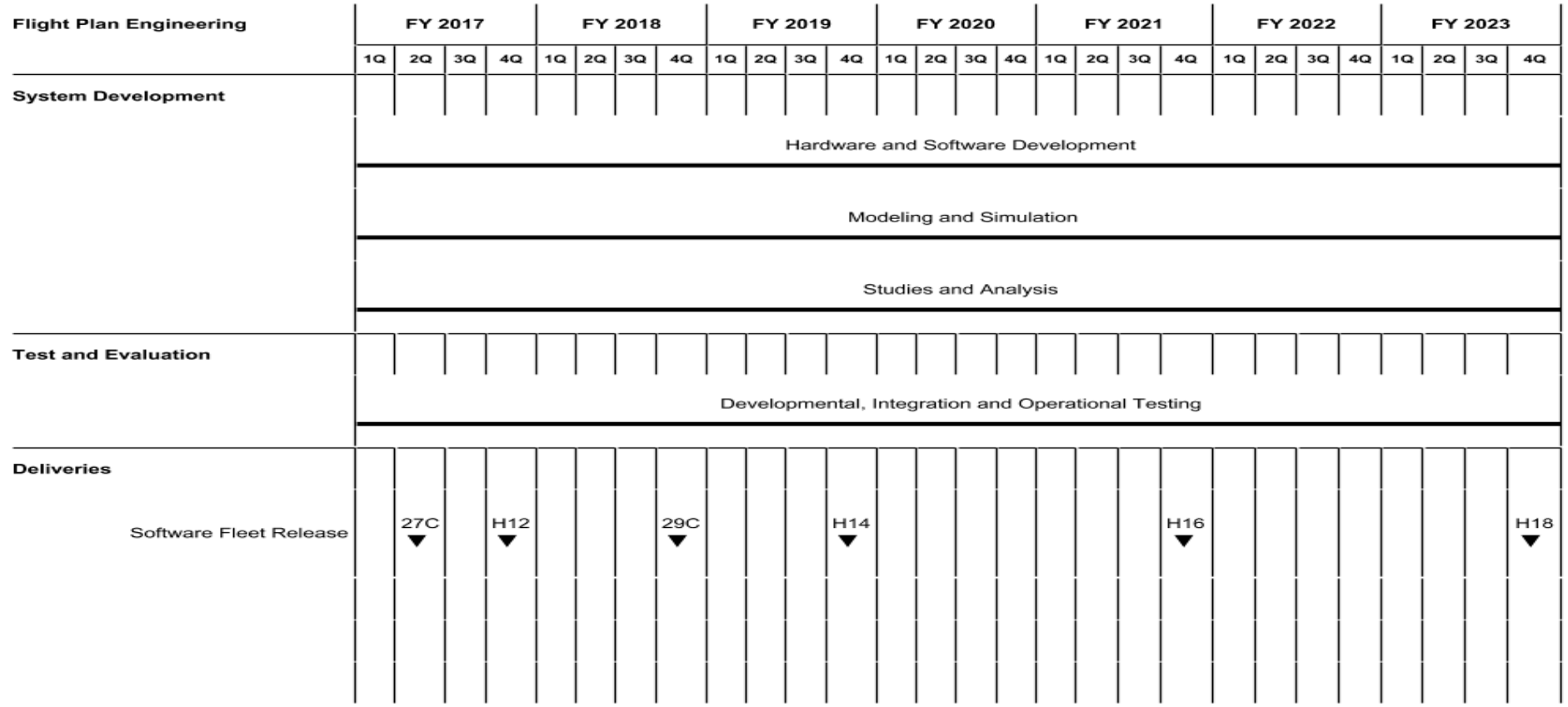
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*



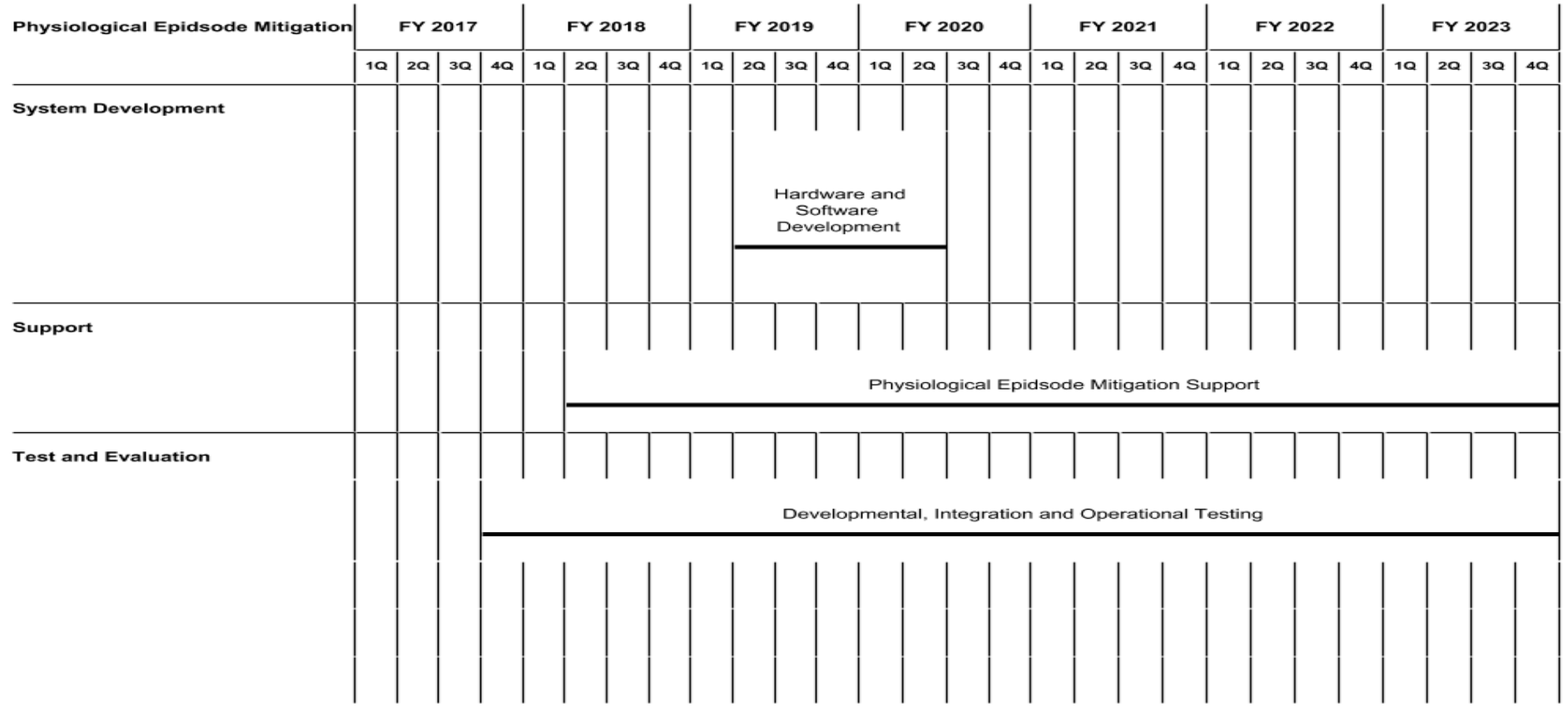
2019PB - 0204136N - 1662

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*



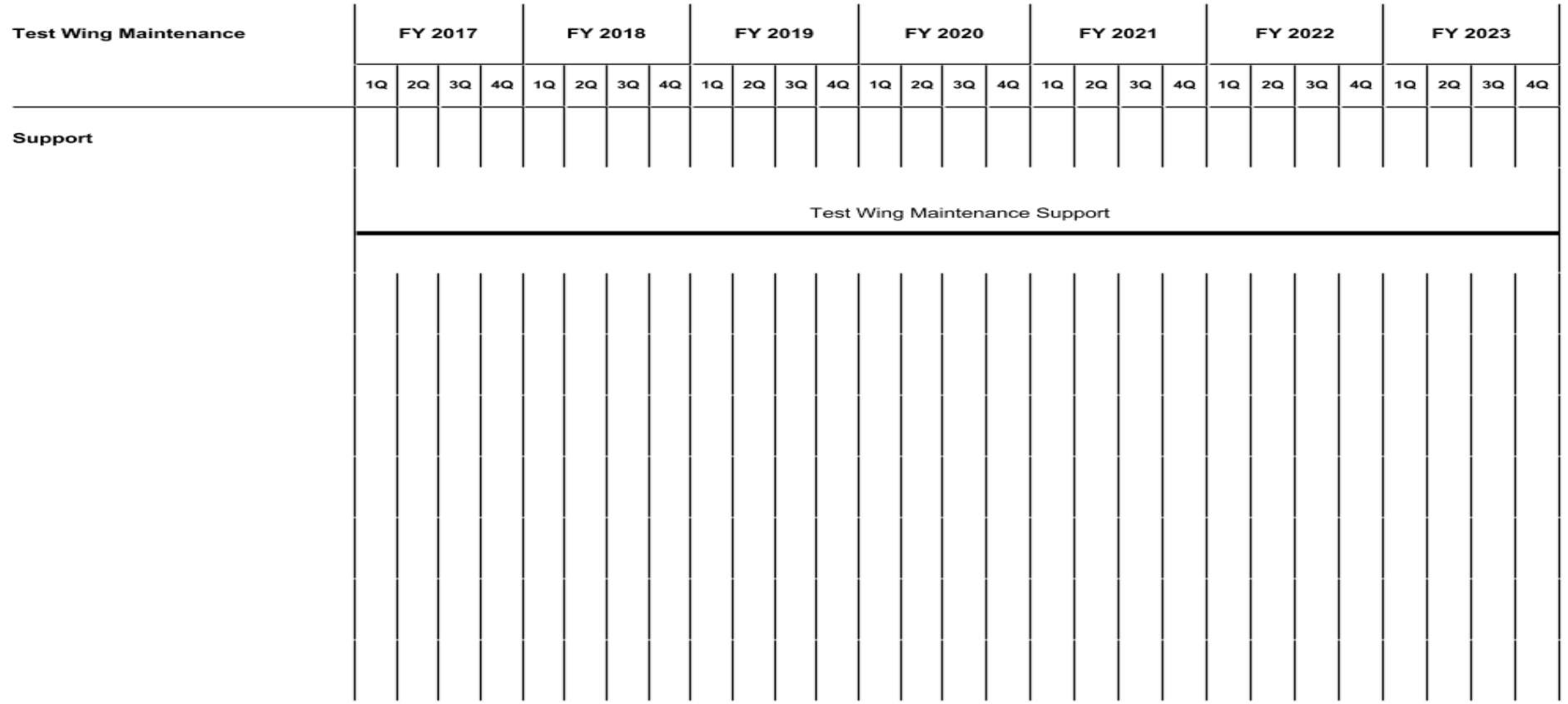
2019PB - 0204136N - 1662

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*



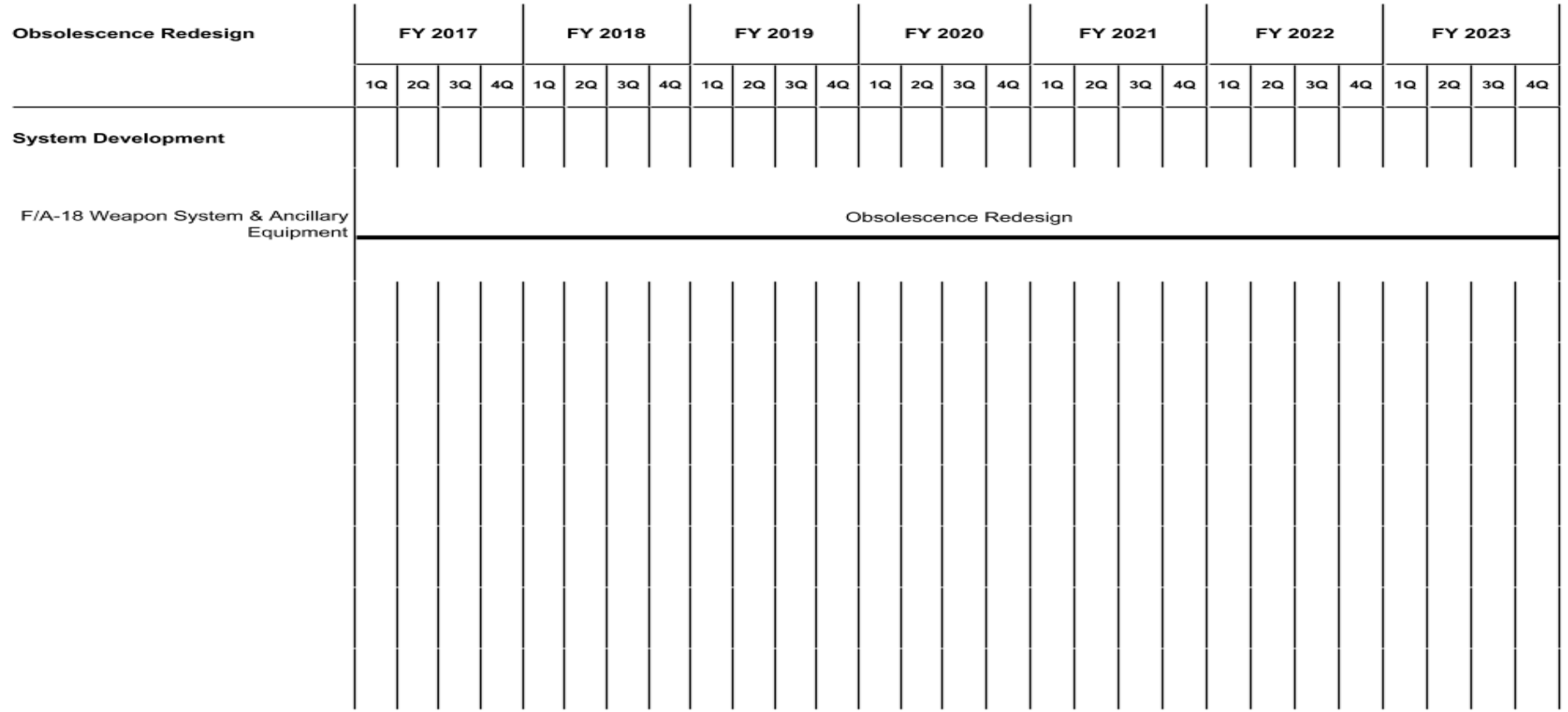
2019PB - 0204136N - 1662

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*



2019PB - 0204136N - 1662

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*



2019PB - 0204136N - 1662

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Multi-System Integration				
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
Test & Evaluation: H12 Operational Testing	1	2017	4	2017
Test & Evaluation: 27C Operational Testing	4	2017	2	2018
Test & Evaluation: H14 Integration Testing	1	2017	4	2018
Test & Evaluation: H14 Developmental Testing	4	2017	3	2018
Test & Evaluation: H14 Operational Testing	4	2018	4	2019
Test & Evaluation: H16 Integration Testing	2	2018	4	2020
Test & Evaluation: H16 Operational Testing	4	2020	4	2021
Test & Evaluation: H18 Integration Testing	2	2020	4	2022
Test & Evaluation: H18 Operational Testing	4	2022	4	2023
Test & Evaluation: H20 Integration Testing	2	2022	4	2023
Test & Evaluation: 29C Integration Testing	1	2017	3	2019
Deliveries: H12 Fleet Release	4	2017	4	2017
Deliveries: 27C Fleet Release	2	2018	2	2018
Deliveries: 29C Fleet Release	4	2019	4	2019
Deliveries: H14 Fleet Release	4	2019	4	2019
Deliveries: H16 Fleet Release	4	2021	4	2021
Deliveries: H18 Fleet Release	4	2023	4	2023
Flight Plan Engineering				
System Development: Hardware and Software Development	1	2017	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 1662 / *F/A-18 Improvement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
System Development: Modeling and Simulation	1	2017	4	2023
System Development: Studies and Analysis	1	2017	4	2023
Test and Evaluation: Developmental, Integration and Operational Testing	1	2017	4	2023
Deliveries: Software Fleet Release: H12 Fleet Release	4	2017	4	2017
Deliveries: Software Fleet Release: 27C Fleet Release	2	2017	2	2017
Deliveries: Software Fleet Release: 29C Fleet Release	4	2018	4	2018
Deliveries: Software Fleet Release: H14 Fleet Release	4	2019	4	2019
Deliveries: Software Fleet Release: H16 Fleet Release	4	2021	4	2021
Deliveries: Software Fleet Release: H18 Fleet Release	4	2023	4	2023
Physiological Epidsode Mitigation				
System Development: Hardware and Software Development	2	2019	2	2020
Support: Physiological Epidsode Mitigation Support	2	2018	4	2023
Test and Evaluation: Developmental, Integration and Operational Testing	4	2017	4	2023
Test Wing Maintenance				
Support: Test Wing Maintenance Support	1	2017	4	2023
Obsolescence Redesign				
System Development: F/A-18 Weapon System & Ancillary Equipment: Obsolescence Redesign Development & Testing	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2065 / *F/A-18 Radar Upgrade*	

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
2065: *F/A-18 Radar Upgrade*	726.534	10.844	8.018	7.002	-	7.002	8.773	8.782	8.959	9.141	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

F/A-18 Radio Detection and Ranging (RADAR) Upgrade: The F/A-18 RADAR Upgrade, Active Electronically Scanned Array (AESA) development program, which began in FY 1999, is the last of three pre-planned upgrades to the F/A-18 Type/Model/Series RADAR. The AESA system corrects operational test deficiencies noted in the AN/APG-73. It provides multi-target tracking, Synthetic Aperture RADAR (SAR) imagery, SAR Target Location Error (TLE), and improved spotlight map resolution. In addition, it provides greater lethality than previous F/A-18 RADARs by allowing full tactical support of existing and planned air-to-air (A/A) and air-to-ground (A/G) weapons and it significantly increases A/A and A/G detection and tracking ranges. The AESA system provides greater survivability through self-protection and standoff jamming capabilities, while its greater range allows for reduced detection by enemy RADAR. This budget continues spiral capability development of AESA with increased efforts to address Phase II Operational Requirements Document requirements such as Counter-Electronic Attack(CEA) against multiple Radio Frequency Emitters, AESA Multi-Jammer Electronic Protection, Precision TLE Improvement, Monopulse and 5th/6th Channel development and Air Combat Maneuvering/Short Range Search and Track development and includes upgrades to RADAR Instrumentation, test and evaluation assets and threat assets, and upgraded modeling and simulation of both clean and Electronic Attack threat environments. Budget also supports development and testing of design modifications to address obsolescence issues with APG-65, APG-73 and APG-79 RADAR 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: Distributed Targeting - CEA Software Development, Developmental Testing, Operational Testing, & Integration	9.609	5.788	6.085	0.000	6.085
Articles:	-	-	-	-	-
Description: Funding being utilized to support hardware (HW) and software (SW) capabilities development, integration and associated testing.					
FY 2018 Plans: Continue HW/SW development, integration and testing of instrumentation required to support AESA RADAR spiral capability upgrades. Funds engineering efforts associated with software development and integration of active and passive kill chain capabilities and sensors into the AESA Radar in support of CEA.					
FY 2019 Base Plans: Continue HW/SW development, integration and testing of instrumentation required to support AESA RADAR spiral capability upgrades. Funds engineering efforts associated with software development and integration of					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2065 / *F/A-18 Radar Upgrade*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
active and passive kill chain capabilities and sensors into the AESA Radar in support of CEA. H14 Operational testing and H16 Integration testing starts in FY18 and continues into FY19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was increased by $.297 million to support H16 CEA software development and integration requirements to include additional active and passive kill chain capabilities.					
Title: F/A-18 RADAR 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 F/A-18 RADAR system obsolescence issues. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was decreased by $1.313 million to support H16 CEA software development and integration requirements to include additional active and passive kill chain capabilities.	1.235 -	2.230 -	0.917 -	0.000 -	0.917 -
Accomplishments/Planned Programs Subtotals	10.844	8.018	7.002	0.000	7.002

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 Mod (OSIP 002-07)*	219.347	130.400	165.683	-	165.683	191.508	96.376	52.728	120.307	90.192	2,009.004
• APN/0145: *FA-18E/F*	1,146.912	1,200.146	1,990.524	-	1,990.524	1,929.651	1,948.066	1,731.992	1,663.687	0.000	55,476.794
• APN/0145C: *FA-18E/F*	0.000	52.971	58.799	-	58.799	62.499	54.828	41.150	0.000	0.000	270.247

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2065 / *F/A-18 Radar Upgrade*

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 Active Electronically Scanned Array program continues developmental efforts following a successful Full Rate Production milestone decision, after completing a two-phase Acquisition approach during the FY1999 through FY2007 timeframe. This strategy continues utilization of reform initiatives such as: early partnering with industry; leveraging industry investment; optimizing use of Commercial Off-The Shelf software and Non-Developmental Item; using Cost as an Independent Variable; and Electronic Data Deliverables. Basic Ordering Agreement orders for Request for Proposal developments are in place for Boeing, the airframe prime manufacturer/ integrator, and Raytheon, the Radio Detection and Ranging RADAR manufacturer, for focused risk reduction and sustainment of prior developmental activities.

E. Performance Metrics

Execute the system engineering process for software delivery and support the design and development of Electronic Protection, air to air, and air to ground capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2065 / *F/A-18 Radar Upgrade*

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	6.084	2.180	Nov 2016	1.915	Nov 2017	1.374	Nov 2018	-		1.374	Continuing	Continuing	Continuing
CEA - Development/ Integration Counter Electronic Attack (CEA)	Various	NSMA : Arlington, VA	77.427	5.197	Dec 2016	2.825	Dec 2017	2.333	Dec 2018	-		2.333	Continuing	Continuing	Continuing
Systems Engineering - Capabilities	WR	NAWCWD : China lake, CA	0.000	0.000		1.000	Dec 2017	1.020	Dec 2018	-		1.020	0.000	2.020	-
Hardware-Obsolescence	MIPR	DMEA : Sacramento, CA	1.210	1.165	May 2017	0.899	May 2018	0.917	May 2019	-		0.917	Continuing	Continuing	Continuing
Prior Year Prod Dev cost no longer funded in FYDP	Various	Various : Various	468.195	0.000		0.000		0.000		-		0.000	0.000	468.195	-
		Subtotal	552.916	8.542		6.639		5.644		-		5.644	Continuing	Continuing	N/A

Remarks

Systems Engineering - Capabilities: Cyber security regulations require additional measures. This funds USG personnel to conduct an independent review of RADAR software code developed by Raytheon.

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 (Instrumentation)	WR	NAWCWD : China Lake, CA	44.173	0.250	Dec 2016	0.150	Dec 2017	0.153	Dec 2018	-		0.153	Continuing	Continuing	Continuing
Chamber Support	WR	NSMA : Arlington, VA	0.000	0.000		0.500	Dec 2017	0.510	Dec 2018	-		0.510	0.000	1.010	-
Obsolescence Redesign	Various	Various : Various	0.300	0.070	May 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Support cost no longer funded in the FYDP	Various	Various : Various	2.027	0.000		0.000		0.000		-		0.000	0.000	2.027	-
		Subtotal	46.500	0.320		0.650		0.663		-		0.663	Continuing	Continuing	N/A

Remarks

Chamber Support: Funding is for (test) chamber support; supports testing of CEA and software capabilities on the RADAR.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2065 / *F/A-18 Radar Upgrade*	

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	WR	NAWCWD : China Lake, CA	0.000	0.300	Dec 2016	0.150	Dec 2017	0.121	Dec 2018	-		0.121	Continuing	Continuing	Continuing
AESA Radar Test Asset	C/FPIF	Raytheon : El Segundo, CA	0.000	1.103	Mar 2017	0.000		0.000		-		0.000	0.000	1.103	1.103
Prior Year T&E cost no longer funded in FYDP	Various	Various : Various	110.808	0.000		0.000		0.000		-		0.000	0.000	110.808	-
		Subtotal	110.808	1.403		0.150		0.121		-		0.121	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 (Seaport CSS)	C/CPFF	Wyle : Pax River, MD	8.229	0.414	Dec 2016	0.414	Dec 2017	0.422	Dec 2018	-		0.422	0.000	9.479	9.479
Contractor Engineering Support	Various	Various : Various	3.078	0.018	Dec 2016	0.018	Dec 2017	0.018	Dec 2018	-		0.018	0.000	3.132	3.132
Program Management Support	WR	NAWCAD : Pax River, MD	3.213	0.101	Dec 2016	0.101	Dec 2017	0.087	Dec 2018	-		0.087	0.800	4.302	-
Travel	Various	NAVAIR : Pax River, MD	1.790	0.046	Nov 2016	0.046	Nov 2017	0.047	Nov 2018	-		0.047	0.000	1.929	-
		Subtotal	16.310	0.579		0.579		0.574		-		0.574	0.800	18.842	N/A

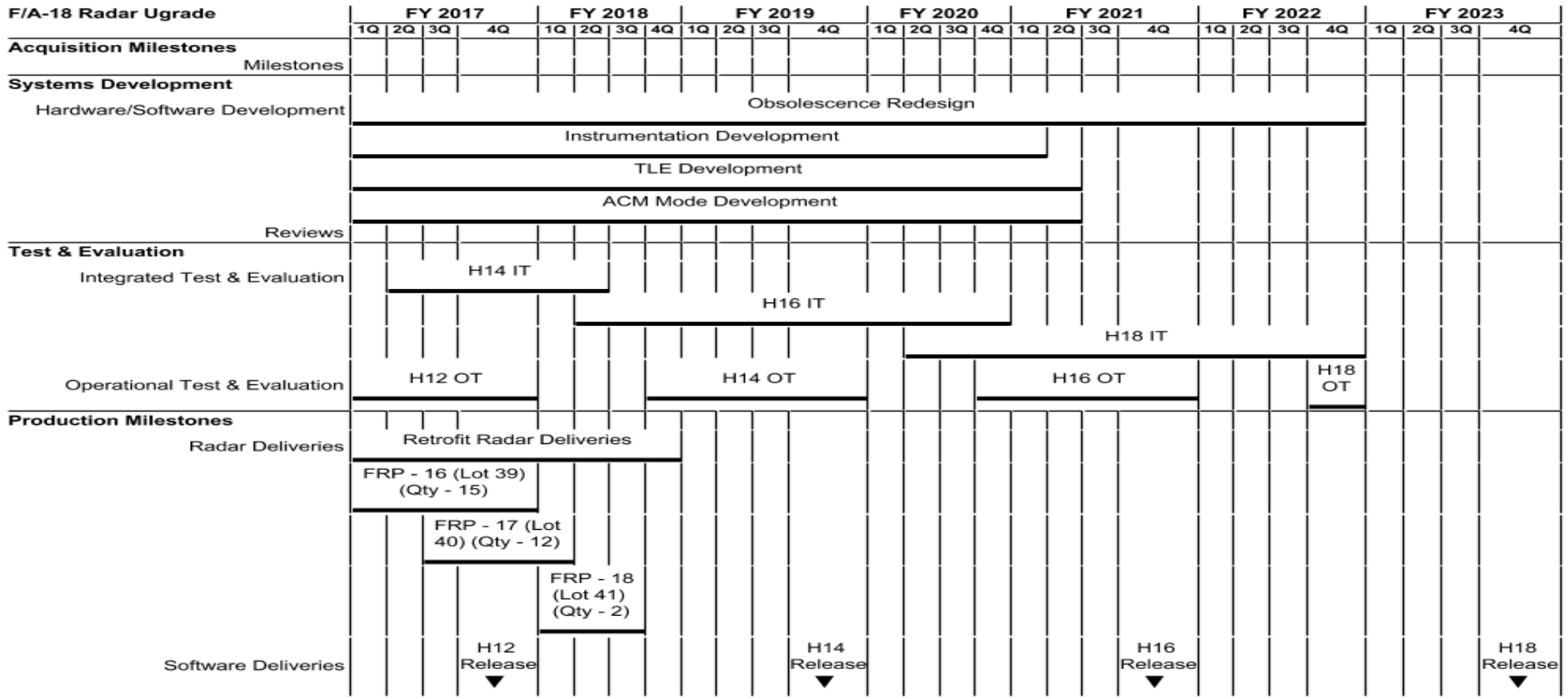
Remarks

Seaport support is noted and can be different based on overall bill, and PMA division of services provided.

	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	726.534	10.844		8.018		7.002		-		7.002	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2065 / *F/A-18 Radar Upgrade*



2019PB - 0204136N - 2065

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2065 / *F/A-18 Radar Upgrade*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
F/A-18 Radar Ugrade				
Systems Development: Hardware/Software Development: Obsolescence Redesign Development & Testing	1	2017	4	2022
Systems Development: Hardware/Software Development: Instrumentation Development	1	2017	1	2021
Systems Development: Hardware/Software Development: TLE Development	1	2017	2	2021
Systems Development: Hardware/Software Development: ACM Mode Development	1	2017	2	2021
Test & Evaluation: Integrated Test & Evaluation: H14 Integration Testing	2	2017	2	2018
Test & Evaluation: Integrated Test & Evaluation: H16 Integration Testing	2	2018	4	2020
Test & Evaluation: Integrated Test & Evaluation: H18 Integration Testing	2	2020	4	2022
Test & Evaluation: Operational Test & Evaluation: H12 Operational Testing	1	2017	4	2017
Test & Evaluation: Operational Test & Evaluation: H14 Operational Testing	4	2018	4	2019
Test & Evaluation: Operational Test & Evaluation: H16 Operational Testing	4	2020	4	2021
Test & Evaluation: Operational Test & Evaluation: H18 Operational Testing	4	2022	4	2022
Production Milestones: Radar Deliveries: Retrofit Radar Deliveries	1	2017	4	2018
Production Milestones: Radar Deliveries: FRP Deliveries B - 16 (Lot 39)	1	2017	4	2017
Production Milestones: Radar Deliveries: FRP Deliveries B - 17 (Lot 40)	3	2017	1	2018
Production Milestones: Radar Deliveries: FRP Deliveries B - 18 (Lot 41)	1	2018	3	2018
Production Milestones: Software Deliveries: H12 FLEET RELEASE	4	2017	4	2017
Production Milestones: Software Deliveries: H14 FLEET RELEASE	4	2019	4	2019
Production Milestones: Software Deliveries: H16 FLEET RELEASE	4	2021	4	2021
Production Milestones: Software Deliveries: H18 FLEET RELEASE	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2069 / *F/A-18 Infrared Search and Track (IRST)*	

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
2069: *F/A-18 Infrared Search and Track (IRST)*	0.000	94.094	86.993	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	181.087
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: P510

A. Mission Description and Budget Item Justification

F/A-18 Infra-Red Search and Track (IRST): The F/A-18 E/F IRST system is a passive long-wave Infra-Red (IR) sensor which provides an alternate fire control system in a high Electronic Attack / Radio Detection and Ranging (RADAR) denied environment. The IRST Block II Engineering Change Proposal (ECP) upgrades two Weapons Replaceable Assemblies (WRAs); the Infra-Red Receiver (IRR) and processor in order to provide full Capabilities Development Document (CDD) capability and enhanced warfighting capability through an improved engagement timeline, improved situational awareness, longer range passive detection and tracking and a larger field of regard with specification performance.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Infra-Red Search and Track (IRST)	94.094	86.993	0.000	0.000	0.000
Articles:	6	-	-	-	-

Description: Technology development and engineering and manufacturing development of an IRST sensor for the F/A-18 E/F. Block I supported technology development and engineering and manufacturing development of an IRST sensor for the F/A-18E/F to provide an alternate fire control system in a high Electronic Attack / Radio Detection and Ranging (RADAR) denied environment. Block I systems currently in production will be utilized as test assets for continued integration, tactics development and aircrew familiarization; will be upgraded via retrofit to a Block II configuration prior to fleet delivery. Block II IRST upgrades the Infra-Red Receiver (IRR) and processor to provide full Capabilities Development Document (CDD) capability and enhanced warfighting capability through an improved engagement timeline, improved situational awareness, longer range passive detection and tracking and a larger field of regard with specification performance.

FY 2018 Plans:

Award IRST Block II ECP Development Phase 2 (hardware and software). Conduct IRST Block II ECP System level Preliminary Design Review and Critical Design Review. Continue IRST Integration Testing (H14 and H16). Complete instrumentation of Block I production units. Continue development of support equipment and complete specific Block II technology, performance, reliability and producability trade studies. Begin King Air

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2069 / *F/A-18 Infrared Search and Track (IRST)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Integration Lab flight testing. Conduct H14 DT/OT assist. Continue Block I/II prototype/EDM conversions and upgrades to full Block II configuration. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 - FY 2023 funding was transferred to Program Element 0604014N F/A-18 Infrared Search and Track (IRST) PU 2069.					
Accomplishments/Planned Programs Subtotals	94.094	86.993	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/05250: *F-18 Series Mod (OSIP 04-14)*	2.478	3.655	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	161.021

Remarks

D. Acquisition Strategy

Infra-Red Search and Track (IRST). The IRST system is an evolutionary Navy acquisition program with Block I and Block II capabilities. The IRST Block I system developed by the Navy provides a basic capability, supported integration of the sensor onto a fuel tank and into the aircraft and supported aeromechanical flight test required for clearance and carrier qualification of the system. IRST Block I is in the Production and Deployment phase following a successful MS-C decision in December 2014 and will support continued integration with the F/A-18E/F Advanced Mission Computer software through flight testing with System Configuration Sets H14 and H16.

IRST Block II is an ECP to upgrade two WRAs that will provide full CDD capability. Early risk reduction activities were initiated in FY2016, the program executed a pre-development In Progress Review (IPR 1) in October 2017 and has a planned pre-production IPR (IPR 2) scheduled for 4th Quarter FY2018 leading to a planned low rate initial production (APN-5 funded) start in FY2019 to achieve an Initial Operating Capability (IOC) in 4th Quarter FY2021.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2069 / *F/A-18 Infrared Search and Track (IRST)*

E. Performance Metrics

IRST Program achieved MS B on 17 June 2011, achieved MS C on 02 December 2014. IRST Block II Pre-Development IPR-1 was conducted 1st Quarter 2018; Pre-Production IPR-2 is scheduled for 4th Quarter FY2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2069 / *F/A-18 Infrared Search and Track (IRST)*

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 Development (Hardware/Software) Infra-Red Search and Track (IRST)	Various	Boeing : St. Louis, MO	0.000	36.266	May 2017	26.048	Dec 2017	0.000		-		0.000	0.000	62.314	62.314
Hardware Development	MIPR	USAF (MIT) : Hanscom AFB, MA	0.000	0.522	Jul 2017	1.000	Nov 2017	0.000		-		0.000	0.000	1.522	-
Software (S/W) Development	WR	NAWCWD : China Lake, CA	0.000	5.283	Jun 2017	3.057	Dec 2017	0.000		-		0.000	0.000	8.340	-
IRST Support Equipment Development	WR	NAWCAD : Lakehurst, NJ	0.000	0.047	Nov 2016	0.045	Nov 2017	0.000		-		0.000	0.000	0.092	-
Primary Development	Various	NSMA : Various	0.000	40.156	Mar 2017	44.832	Jan 2018	0.000		-		0.000	0.000	84.988	-
		Subtotal	0.000	82.274		74.982		0.000		-		0.000	0.000	157.256	N/A

Remarks

NAWCAD Lakehurst, New Jersey, is developing Support Equipment necessary to support the IRST pods. Block II EMD effort ramps up significantly in FY 2019 to support alignment with H16 development and testing in order to achieve IOC in FY 2021.

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	NAWCWD : China Lake, CA	0.000	1.133	Mar 2017	1.143	Nov 2017	0.000		-		0.000	0.000	2.276	-
Development Support	WR	NAWCAD : Patuxent River, MD	0.000	2.239	Mar 2017	2.866	Nov 2017	0.000		-		0.000	0.000	5.105	-
Development Support	WR	NSWC : Indian Head, MD	0.000	0.060	Jul 2017	0.060	Nov 2017	0.000		-		0.000	0.000	0.120	-
Development Support	WR	NAWCWD : Pt. Mugu, CA	0.000	0.022	Jul 2017	0.022	Dec 2017	0.000		-		0.000	0.000	0.044	-
Development Support	WR	FRC Southeast : Jacksonville, FL	0.000	0.917	Nov 2016	0.900	Nov 2017	0.000		-		0.000	0.000	1.817	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2069 / *F/A-18 Infrared Search and Track (IRST)*

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/CPFF	NRL : Washington, DC	0.000	0.338	Jun 2017	0.344	Dec 2017	0.000		-		0.000	0.000	0.682	0.682
Development Support	WR	NAVSUP : Mechanicsburg, PA	0.000	0.040	Jun 2017	0.041	Jan 2018	0.000		-		0.000	0.000	0.081	-
Obsolescence Redesign	Various	Various : Various	0.000	0.250	Dec 2016	0.250	Dec 2017	0.000		-		0.000	0.000	0.500	-
		Subtotal	0.000	4.999		5.626		0.000		-		0.000	0.000	10.625	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	NAWCAD : Patuxent River, MD	0.000	1.183	Mar 2017	1.196	Nov 2017	0.000		-		0.000	0.000	2.379	-
Developmental Test & Evaluation (DT&E)	WR	NAWCWD : China Lake, CA	0.000	5.337	May 2017	3.998	Nov 2017	0.000		-		0.000	0.000	9.335	-
Operational Test & Evaluation (OT&E) - CSS	Various	OPTEVFOR : VX-9	0.000	0.106	Jul 2017	0.110	Jul 2018	0.000		-		0.000	0.000	0.216	-
Operational Test & Evaluation (OT&E) - CSS	Various	OPTEVFOR : Norfolk, VA	0.000	0.000		0.100	Mar 2018	0.000		-		0.000	0.000	0.100	-
		Subtotal	0.000	6.626		5.404		0.000		-		0.000	0.000	12.030	N/A

Management Services ($ in Millions)

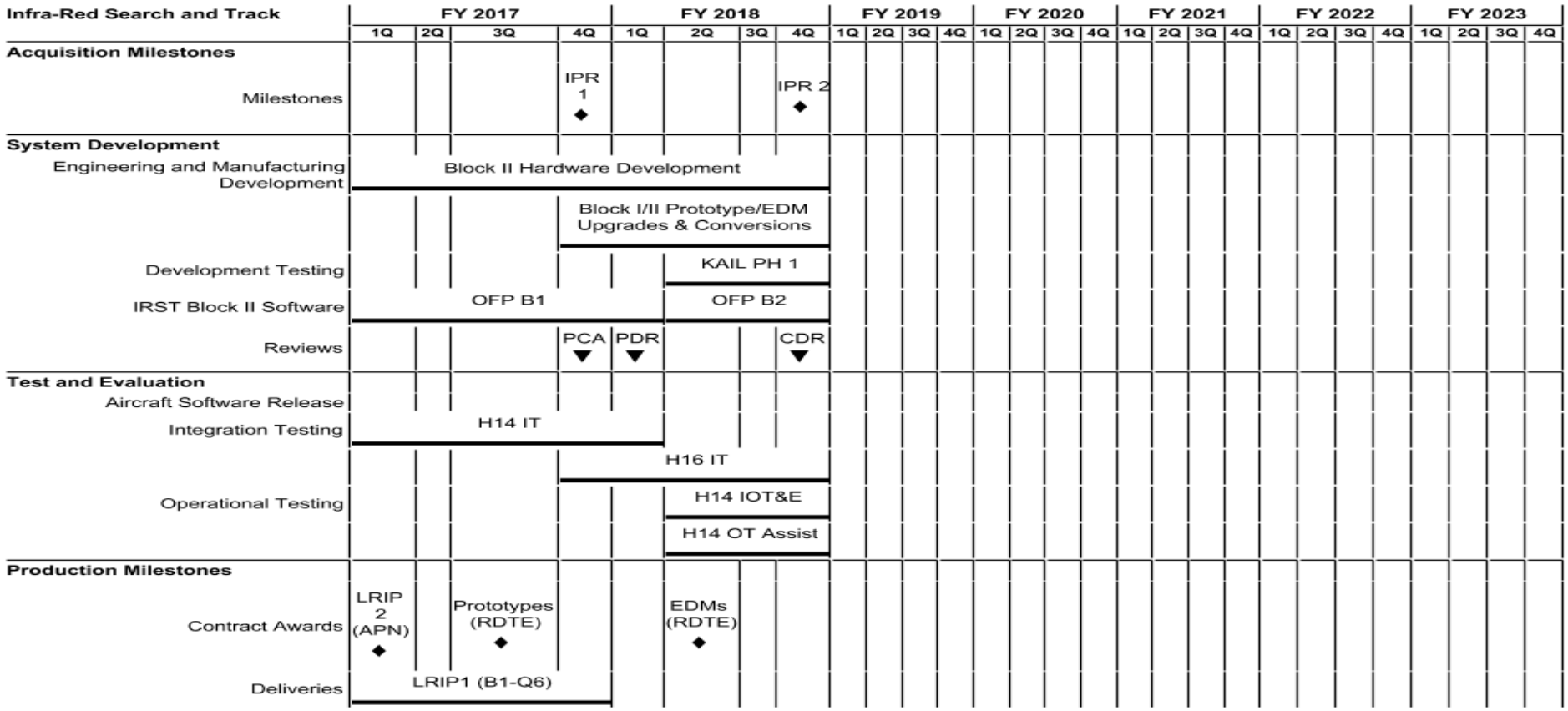
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	NAVAIR : Patuxent River, MD	0.000	0.020	Oct 2016	0.020	Oct 2017	0.000		-		0.000	0.000	0.040	-
Program Management Support - MISC	Various	NAWCAD : Patuxent River, MD	0.000	0.175	Oct 2016	0.961	Oct 2017	0.000		-		0.000	0.000	1.136	-
		Subtotal	0.000	0.195		0.981		0.000		-		0.000	0.000	1.176	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2069 / *F/A-18 Infrared Search and Track (IRST)*	

	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	94.094		86.993		0.000		-		0.000	0.000	181.087	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2069 / *F/A-18 Infrared Search and Track (IRST)*



2019PB - 0204136N - 2069

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2069 / *F/A-18 Infrared Search and Track (IRST)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Infra-Red Search and Track				
Acquisition Milestones: Milestones: Pre-development In Process Review (IPR 1)	4	2017	4	2017
Acquisition Milestones: Milestones: Pre-production In Process Review (IPR 2)	4	2018	4	2018
System Development: Engineering and Manufacturing Development: Block II ECP Hardware Development	1	2017	4	2018
System Development: Engineering and Manufacturing Development: Sensor Hardware Conversion and Upgrades (Block I/II Prototype & EDM)	4	2017	4	2018
System Development: Development Testing: King Air Integration Lab Block II Phase I	2	2018	4	2018
System Development: IRST Block II Software: IRST OFP SW B1	1	2017	1	2018
System Development: IRST Block II Software: IRST OFP SW B2	2	2018	4	2018
System Development: Reviews: Block II ECP System PDR	1	2018	1	2018
System Development: Reviews: Block II ECP System CDR	4	2018	4	2018
System Development: Reviews: Physical Configuration Audit (PCA)	4	2017	4	2017
Test and Evaluation: Integration Testing: SCS H14 Integration Testing	1	2017	1	2018
Test and Evaluation: Integration Testing: SCS H16 Integration Testing	4	2017	4	2018
Test and Evaluation: Operational Testing: SCS H14 Integrated Operational Test & Evaluation (IOT&E)	2	2018	4	2018
Test and Evaluation: Operational Testing: SCS H14 OT Assist	2	2018	4	2018
Production Milestones: Contract Awards: Block II Prototype Test Assets (RDTE)	3	2017	3	2017
Production Milestones: Contract Awards: Block II EDM Test Assets (RDTE)	2	2018	2	2018
Production Milestones: Contract Awards: Block I LRIP 2 (APN)	1	2017	1	2017
Production Milestones: Deliveries: LRIP 1 (Block I Lot 1 - Qty 6)	1	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2071 / *F/A-18 Block 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
2071: *F/A-18 Block III*	0.000	0.000	59.700	83.146	-	83.146	88.342	30.158	0.000	0.000	0.000	261.346
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

F/A-18 Block III is a series of several of Engineering Change Proposals (ECPs) that bring several planned upgrades to the F/A-18E/F. The combined impact of these upgrades brings significant capability to the aircraft. Block III is a follow-on to Block II upgrades. The FY18 budget request funds Non-Recurring Engineering (NRE) for these ECPs which include Advanced Network Architecture, aircraft Signature Enhancements, Advanced Cockpit Displays, and Conformal Fuel tanks.

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 Block III	0.000	59.700	83.146	0.000	83.146
Articles:	-	-	-	-	-

Description: Block III Super Hornet upgrades provide additional capability to the aircraft and its contribution to the Airwing are significant. The capability upgrades consist of several Engineering Change Proposals (ECPs) which will be incorporated in the near term with a combination of forward fit production line incorporation and via retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan. The FY18 budget request funds Non-Recurring (NRE) for these ECPs.

FY 2018 Plans:

F/A-18 Block III is a series of several of Engineering Change Proposals (ECPs) that bring several planned upgrades to the F/A-18E/F aircraft. The combined impact of these upgrades brings significant capability to the aircraft. The FY18 budget request funds the Non-Recurring (NRE) needed for these ECPs.

FY 2019 Base Plans:

F/A-18 Block III is a series of several of Engineering Change Proposals (ECPs) that bring several planned upgrades to the F/A-18E/F aircraft. The combined impact of these upgrades brings significant capability to the aircraft. The FY19 budget request funds the Non-Recurring (NRE) needed for these ECPs. F/A Block III flight testing will have significant increase in flight testing in FY2019 for advance cockpit, and conformal fuel tank.

FY 2019 OCO Plans:

N/A

FY 2018 to FY 2019 Increase/Decrease Statement:

The FY 2019 funding request was increased by $23.446 million. The initial F/A-18 Block III

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2071 / *F/A-18 Block III*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
concept includes low risk changes which can be incorporated in the near term with a combination of forward fit production line incorporation and via retrofit modifications to the aircraft already planned as part of the Service Life Modification (SLM) Plan. The FY19 budget request funds Non-Recurring (NRE) for these ECPs.					
Accomplishments/Planned Programs Subtotals	0.000	59.700	83.146	0.000	83.146

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/0525: *F-18 Series*	999.424	943.661	1,213.482	-	1,213.482	1,350.530	1,364.484	1,360.496	1,714.989	7,939.984	25,104.766
• APN/0145: *FA-18E/F*	1,146.912	1,200.146	1,990.524	-	1,990.524	1,929.651	1,948.066	1,731.992	1,663.687	0.000	55,476.794

Remarks

D. Acquisition Strategy

A series of Block III Engineering Change Proposals (ECPs) are planned to be incorporated into production aircraft starting in FY19. The ECPs will provide capability upgrades to Block II aircraft to give them Block III capabilities. Block II Fleet aircraft (Lots 26 and up) will receive capability upgrades when inducted for Service Life Modification (SLM) events.

E. Performance Metrics

The PB19 budget request funds the Non-Recurring Engineering (NRE) for the Block III Engineering Change Proposals (ECPs) that will provide upgraded capabilities to the F/A-18 E/F aircraft. Block III capability upgrades is planned to be incorporated into the aircraft on the production line starting with the FY19 procurement. Block II aircraft will receive the Block III ECPs when the aircraft are inducted for Service Life Modification (SLM) events.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	Project (Number/Name) 2071 / *F/A-18 Block III*

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 III primary development	Various	Boeing : St Louis MO	0.000	0.000		56.700	Dec 2017	82.126	Dec 2018	-		82.126	108.500	247.326	249.326
		Subtotal	0.000	0.000		56.700		82.126		-		82.126	108.500	247.326	N/A

Remarks

Flight testing for conformal fuel tanks and advance cock pit systems for BLCK III will be taking place in FY2019.

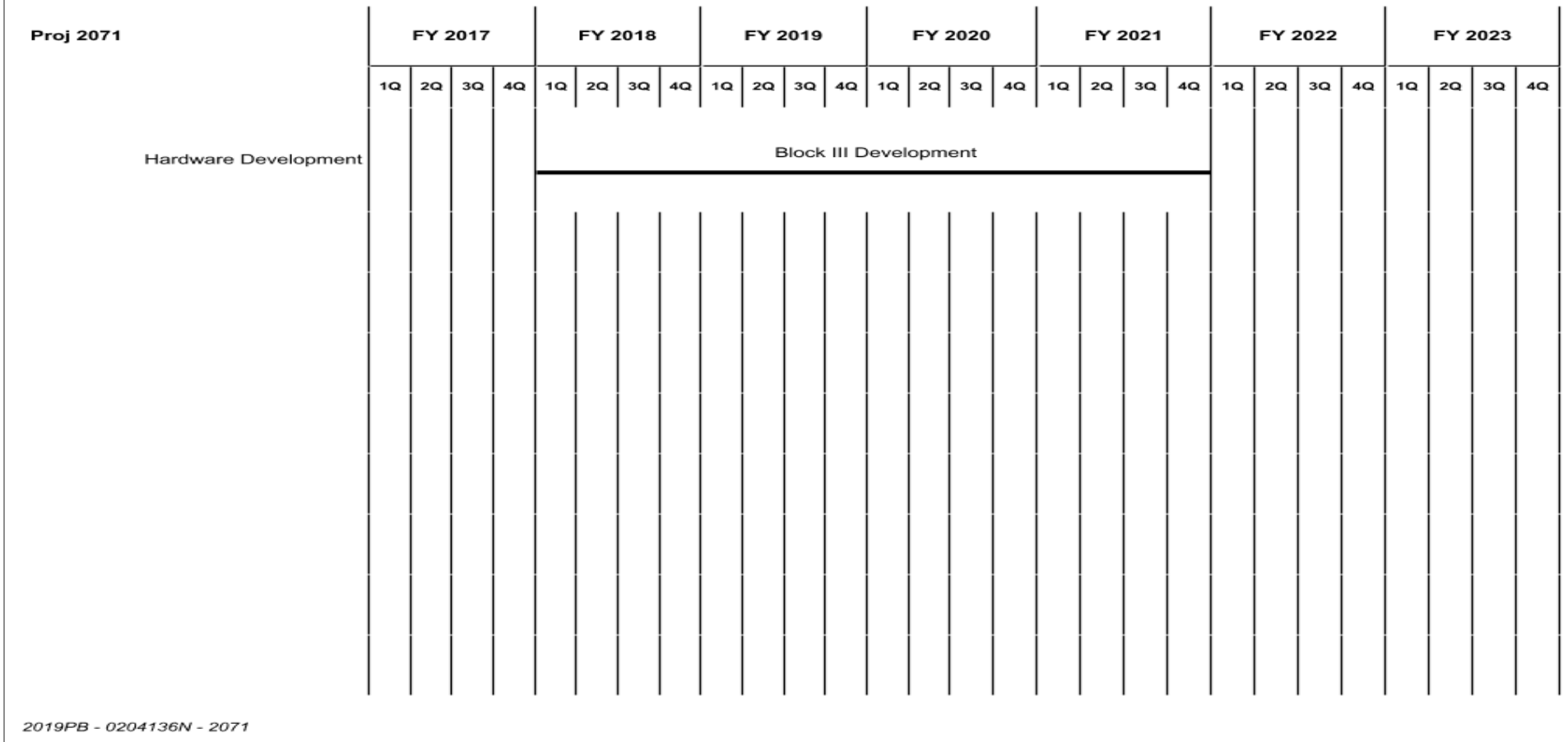
Support ($ in Millions)

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	Various : Various	0.000	0.000		3.000	Dec 2017	1.020	Dec 2018	-		1.020	10.000	14.020	-
		Subtotal	0.000	0.000		3.000		1.020		-		1.020	10.000	14.020	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		59.700		83.146		-		83.146	118.500	261.346	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2071 / *F/A-18 Block III*



2019PB - 0204136N - 2071

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 2071 / *F/A-18 Block III*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2071				
Hardware Development: Block III Development	1	2018	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	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*	21.316	1.934	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	23.250
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional Add.

Noise Reduction study conducted by the University of Mississippi National Center for Physical Acoustics (NCPA).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Noise Reduction	1.934	0.000
FY 2017 Accomplishments: N/A		
FY 2018 Plans: N/A		
Congressional Adds Subtotals	1.934	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 / 7	R-1 Program Element (Number/Name) PE 0204136N / *F/A-18 Squadrons*	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
Universal Armament Interface (UAI)	C/IDIQ	Various : Various	19.621	0.000		0.000		0.000		-		0.000	0.000	19.621	19.621
		Subtotal	19.621	0.000		0.000		0.000		-		0.000	0.000	19.621	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
Universal Armament Interface-Studies and Analysis	WR	NAWCWD : China Lake, CA	0.247	0.000		0.000		0.000		-		0.000	0.000	0.247	-
Noise Reduction-Studies and Analysis	SS/IDIQ	Mississippi : NCPA	1.448	1.934	Aug 2017	0.000		0.000		-		0.000	0.000	3.382	3.382
		Subtotal	1.695	1.934		0.000		0.000		-		0.000	0.000	3.629	N/A

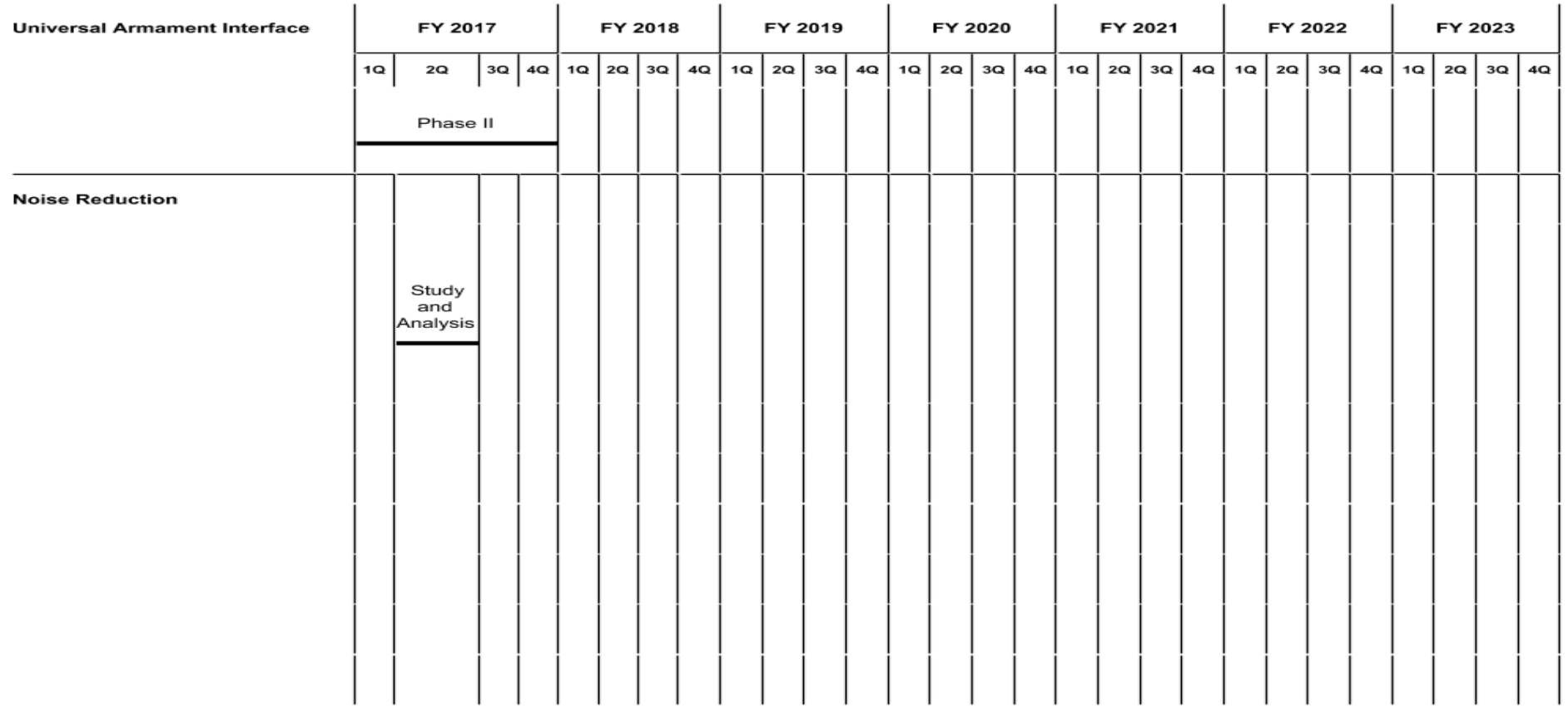
Remarks

Noise reduction study conducted by the University of Mississippi National Center for Physical Acoustics (NCPA).

	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	21.316	1.934		0.000		0.000		-		0.000	0.000	23.250	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*



2019DON - 0204136N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204136N / *F/A-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Universal Armament Interface				
Phase II - Lethality	1	2017	4	2017
Noise Reduction: Study and Analysis	2	2017	2	2017

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204163N *I Fleet Tactical 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	200.574	38.949	33.525	25.014	-	25.014	23.870	4.520	2.478	2.535	Continuing	Continuing
0725: *Communication Automation*	200.574	38.949	33.525	25.014	-	25.014	23.870	4.520	2.478	2.535	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Communication Automation Program is a continuing program that provides for automation and communications upgrades for fleet tactical users. It includes Battle Force Tactical Network (BFTN), Joint Aerial Layer Network-Maritime (JALN-M), High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) and Automated Digital Network System (ADNS).

The Battle Force Tactical Network (BFTN) on each surface, subsurface, air, or fixed US Navy platform utilizes previously installed/existing Line of Sight (LOS)/Extended Line of Sight (ELOS) radios to create a secure gateway that inter-connects all users into a common Radio Frequency (RF) Tactical Network. This network directly supports the Assured Command and Control (C2) posture of US-Only and NATO Allied/Coalition users' tactical data information exchanges on each platform between and/or across separately dispersed RF Networks even if Satellite Communications (SATCOM) channels to shore are lost in an Anti-Access/Area Denial (A2/AD) environment.

Joint Aerial Layer Network-Maritime (JALN-M), a system of systems (SoS) capability, is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially Anti-Access/Area Denial (A2/AD). With disruption or loss of space tier communications, JALN-M establishes and/or restores connectivity with the High Capacity Backbone (HCB) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M Initial Capabilities Document (ICD) and the JALN-M Analysis of Alternatives (AoA) Final Report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the Extended Data Rate (XDR) waveform (Navy Multiband Terminal (NMT)) for intra-battle group DARE communications, a Common Data Link (CDL) waveform for the HCB cross-link capability, and will leverage enhanced Ultra High Frequency/High Frequency (UHF/HF) waveforms for coalition connectivity. Furthermore, a Positioning, Navigation, and Timing (PNT) capability will be developed and integrated into the JALN-M Pod, and will provide position and timing data to other Pod subsystems, both with and without Global Positioning System (GPS) connectivity. Because the Pod is being designed to operate in an A2/AD environment, the Pod HCB and XDR (NMT) subsystems need to be provided with PNT data in the absence of GPS, and the assured PNT subsystem will provide that data. The objective is to provide an alternative communication path in a denied environment, to support key information exchange requirement via ADNS. Flight test demonstration completed in FY18.

High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) and JALN-M are very different approaches to solving the same problem: achieving Assured C2 communications in a satellite-denied environment. The current national focus on highly contested environments has highlighted the growing need for protected, anti-jam and low-probability of detection (LPD), communications. Projects such as JALN-M and HFORCE address capability gaps (network connectivity, network capacity, information and data sharing, network management) to enable assured communications in a satellite-denied environment. Although these projects will supplement and backup current capabilities, they may become the only communications paths available if satellite communications are completely denied. Navy is currently prototyping and demonstrating an aerial relay surrogate SATCOM communications capability under the JALN-M Project. The HFORCE Project will

demonstrate resiliency and throughput enhancements via a half-scale hub-based high frequency (HF) communication architecture. HFORCE will demonstrate a robust communications infrastructure in a SATCOM denied/restricted environment, particularly where beyond-line-of-sight (BLOS) connectivity is required, with seemingly opposing requirements, for long range, high data rates, and LPD. HFORCE will address the need for protected BLOS C4I in SATCOM denied environments where opportunities exist to leverage shore infrastructure to support all Navy platforms with reach back to shore/terrestrial networks that is affordable, reliable and secure.

FY19 HFORCE efforts will focus on the development of half-scale hub, continued Protected High Frequency Waveform (PHFW) and Military Standard Waveform (MSW) development, interoperability and compatibility testing, demonstrations, and system performance simulations.

Automated Digital Network System (ADNS) is the method by which Tactical Navy units transfer Internet Protocol (IP) data to Navy and Department of Defense communities on the Global Information Grid (GIG). ADNS is the gateway to tactical Wide Area Network (WAN) afloat for Internet Protocol network operations, supporting information dissemination and external connectivity. ADNS enables services and applications to interconnect to the Defense Information Systems Network (DISN) ashore via multiple Radio Frequency (RF) resources, to include emerging Assured Command and Control (C2) capabilities and pier connectivity.

FY19 ADNS RDT&E investment will continue to support Interface Design Development (IDD) and integration with network applications, development of Line-Of-Sight (LOS) link, DISN integration, and development of Cipher-Text (CT) piers. ADNS development/integration will include addressing network management, intra and inter domain routing, Quality of Service (QoS), and Concept of Operations discussions. Will continue Network-Based Cyber Security technology and virtualization to increase performance of the Navy's ADNS routing and transport architecture.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	48.225	33.525	22.541	-	22.541
Current President's Budget	38.949	33.525	25.014	-	25.014
Total Adjustments	-9.276	0.000	2.473	-	2.473
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-7.500	0.000			
• SBIR/STTR Transfer	-1.342	0.000			
• Program Adjustments	0.000	0.000	2.817	-	2.817
• Rate/Misc Adjustments	0.000	0.000	-0.344	-	-0.344
• Congressional General Reductions Adjustments	-0.434	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by $5.3 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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204163N *I Fleet Tactical Development*

Joint Aerial Layer Network-Maritime (JALN-M): Due to the Navy's $7.5M reprogramming in FY 2017, shipboard testing and associated ancillary equipment installations in support of the JALN-N architecture flight testing were eliminated.

High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE): The funding increase in FY 2019 is to initiate development of military Transmission Security/Communications Security (TRANSEC/COMSEC) waveform architecture.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204163N / *Fleet Tactical Development*				Project (Number/Name) 0725 / *Communication Automation*			
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**
0725: *Communication Automation*	200.574	38.949	33.525	25.014	-	25.014	23.870	4.520	2.478	2.535	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Battle Force Tactical Network (BFTN) on each surface, subsurface, air, or fixed US Navy platform uses previously installed/existing Line of Sight (LOS)/ Extended Line of Sight (ELOS) radios (a.k.a. Radio Frequency (RF)) to create a secure gateway that inter-connects all users into a common RF Tactical Network (a.k.a. wireless). BFTN enables war-fighters to digitally communicate NATO Allied/Coalition and US-Only information necessary to execute and plan in a real-time operational environment without relying on ashore application server interaction. This RF Network separately supports US-Only Carrier and Expeditionary Strike Group Commanders and maintains the digital communication ability to execute and plan with other U.S. ships, submarines or aircraft, as well as with NATO Allied/Coalition networks, even if Satellite Communication (SATCOM) channels to shore are lost.

Joint Aerial Layer Network-Maritime (JALN-M), a system of systems (SoS) capability, is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially Anti-Access/Area Denial (A2/AD). With disruption or loss of space tier communications, JALN-M establishes and/or restores connectivity with the High Capacity Backbone (HCB) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M Initial Capabilities Document (ICD) and the JALN-M Analysis of Alternatives (AoA) Final Report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the Extended Data Rate (XDR) waveform (Navy Multiband Terminal (NMT)) for intra-battle group DARE communications, a Common Data Link (CDL) waveform for the HCB cross-link capability, and will leverage enhanced Ultra High Frequency/High Frequency (UHF/HF) waveforms for coalition connectivity. Furthermore, a Positioning, Navigation, and Timing (PNT) capability will be developed and integrated into the JALN-M Pod, and will provide position and timing data to other Pod subsystems, both with and without Global Positioning System (GPS) connectivity. Because the Pod is being designed to operate in an A2/AD environment, the Pod HCB and XDR (NMT) subsystems need to be provided with PNT data in the absence of GPS, and the assured PNT subsystem will provide that data. The objective is to provide an alternative communication path in a denied environment, to support key information exchange requirement via ADNS. Flight test demonstration completed in FY18.

The High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) project will demonstrate a robust communications infrastructure in a SATCOM denied/restricted environment, particularly where beyond-line-of-sight (BLOS) connectivity is required with seemingly opposing requirements for long range, high data rates, and low probability of detection (LPD). HForce will address the need for protected and reliable BLOS C4I in SATCOM denied environments where opportunities exist to leverage shore infrastructure to address the SATCOM-denied gap. Recent advances in High Frequency (HF) radio and digital signal processing technologies have increased performance, signal clarify and data transmission capabilities, rapidly making HF a viable option for terrestrial-based, long-range C4I. Digital Wideband HF has the potential to augment current space-based BLOS systems, providing an alternative capability in satellite-denied environments that is affordable, reliable and secure. The HForce project will address this gap by leveraging large gain hub arrays to enhance performance of HF links. Large gain hubs in concert with multi-carrier waveforms and adaptive scheduling provide Mbps-class data rates to large platforms and orders of magnitude improvement in LPD performance over traditional methods. Small scale demonstrations have focused on performance of system at the physical layer. HForce will focus on a larger scale prototype hub to be used with legacy waveforms and legacy radios.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

FY19 HFORCE efforts will focus on the development of half-scale hub, continued Protected High Frequency Waveform (PHFW) and Military Standard Waveform (MSW) development, waveform interoperability and compatibility testing, demonstrations, and system performance simulations.

Automated Digital Network System (ADNS) provides routing, switching, baseband, configuration and monitoring capabilities for interconnecting naval, coalition and joint enclaves worldwide. ADNS utilizes off the shelf equipment and network protocols as specified by the Joint Technical Architecture. ADNS INC III combines all Navy Tactical Voice, Secure Communications Interoperability Protocol (SCIP) Inter-Working Function, video, and data requirements into a converged IP data stream. ADNS INC III supports higher bandwidth satellites, providing up to 25 megabytes per second (Mbps) of throughput on Unit Level ships and up to 50 Mbps on Force Level ships. INC III architecture also incorporates an IPv4/IPv6 dual stack and Cipher-Text (CT) security architecture to align to the Global Information Grid (GIG) in order to mesh Navy Tactical surface, subsurface, and airborne platforms, and Aegis Ashore sites into a single IP environments with gateway functions to coalition and joint networks, in addition to greater security utilizing the High Assurance Internet Protocol Encryptor (HAIPE) devices. ADNS will serve as the Navy tactical interface for IP Networking for not only the JALN-M system but also the key Assured Command and Control (C2) capabilities. ADNS will investigate emerging technologies to integrate with additional Department of Defense C4I Programs to improve inter-strike group networking and extend the network to the tactical edge.

FY19 ADNS RDT&E investment will continue to support Interface Design Development (IDD) and integration with network applications, development of Line-Of-Sight (LOS) link, DISN integration, and development of CT piers. ADNS development will include addressing network management, intra and inter domain routing, QoS, and Concept of Operations discussions. Will continue Network-Based Cyber Security technology and virtualization to increase performance of the Navy's ADNS routing and transport architecture.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Battle Force Tactical Network (BFTN)	5.190	0.499	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Overall program efforts include investigation of emerging technologies through study, development and associated testing for feasibility of program insertion. The BFTN is the Navy's program of record for high-frequency internet protocol (HFIP) and Ultra High Frequency (UHF) Line of Sight (LOS) subnet relay (SNR) communications. BFTN is the only Allied/Coalition option, providing command and control in a non-SATCOM or SATCOM-denied anti-access area-denied (A2AD) environment and serves as a primary backup for SIPRNET (Secret Internet Protocol Router Network) in the absence of satellite communications.					
FY 2018 Plans: Complete and finalize the Initial Operational Test & Evaluation (IOT&E) event, resulting reports and documentation in support of a full rate production decision. Adjudicate any developmental issues identified during IOT&E. Continue to develop engineering solutions for end of life issues, obsolescence, and increase system ease of use for operators.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

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:*** Funding decrease from FY 2018 to FY 2019 is due to the completion of BFTN's RDT&E,N funding.					
Title: Joint Aerial Layer Network -Maritime (JALN-M) ***Articles:*** ***Description:*** Current threats being pursued by US adversaries include the ability to deny US Forces satellite communications. In the absence of satellite communications, JALN-M is a system that can provide high capacity anti-jam communications to naval forces by utilizing aerial relays. The FY18 demonstration will complete the proof-of-concept. ***FY 2018 Plans:*** FY18 efforts include final planning and execution activities to conduct the JALN-M demonstration test flights. Complete installation of Mobile Ground Entry Point (MGEP) Deployable Joint Command and Control (DJC2) at Naval Support Activity (NSA) Northwest Annex (NWA). Submit Interim Authority to Test (IATT) request and obtain Navy Authorizing Official (NAO) approval to continue lab based testing. Demonstration flight test will be executed in two phases. Phase 1 will include localized testing of Pod capabilities against emulated platforms at Naval Undersea Warfare Center (NUWC). Phase 2 will include extended Pod testing at NUWC with connection to live shore networks. Following completion of flight tests, additional efforts include submittal of post demonstration analysis report to OSD. ***FY 2019 Base Plans:*** FY19 efforts include the completion of the post demonstration analysis report to OSD. ***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 JALN-M project nearing completion.	31.050 -	7.097 -	0.500 -	0.000 -	0.500 -
Title: High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) ***Articles:***	0.000 -	25.000 -	23.670 -	0.000 -	23.670 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) will demonstrate a robust communications infrastructure in a SATCOM denied/restricted environment, particularly where beyond-line-of-sight (BLOS) connectivity is required with seemingly opposing requirements for long range, high data rates, and low probability of detection (LPD). HFORCE prototype has the potential to augment current space-based BLOS systems, providing an alternative capability in satellite-denied environments that is affordable, reliable and secure. HFORCE project will address this gap by leveraging large gain hub arrays to enhance performance of HF links. Large gain hubs in concert with multi-carrier waveforms and adaptive scheduling provide Mbps-class data rates to large platforms and orders of magnitude improvement in LPD performance over traditional methods. Small scale demonstrations have focused on performance of system at the physical layer. HFORCE will focus on a larger scale prototype hub to be used with legacy waveforms and legacy radios. ***FY 2018 Plans:*** FY18 HFORCE efforts will use results from JALN-M resiliency studies to inform development of the HFORCE demonstration plan, cost analysis, procurement of commercial off the shelf (COTS) hardware for installation of prototype half-scale hub, and initiate Protected High Frequency Waveform (PHFW) development including interoperability with legacy waveforms. Additional FY18 efforts include programmatic documentation development (e.g. cost estimate, Project Definition Document (PDD)), identifying shore sites for demonstration, develop Security Classification Guide, conduct technical studies necessary to specify systems and design requirements, identify impacts to current demonstration plan and identify needs for test environments for half-scale demonstration sites. Conduct quarterly In-Process Reviews (IPR). HFORCE studies will be conducted to assess and analyze use of existing High Frequency Global Communications System (HFGCS) and alternative shore systems to transmit and receive communications with topside HF antenna systems such as Automated Digital Network System (ADNS), Digital Mobile Radio (DMR) and Battle Force Tactical Network (BFTN). Conduct analysis of application performance and shipboard architecture; independent anti-jam and Low Probability of Detection (LPD) analysis of new HF waveform and ancillary equipment needed for HFORCE prototype implementation. Cost analyses will be conducted to determine cost needed to improve shipboard HF systems. ***FY 2019 Base Plans:*** FY19 efforts will be focused on continued Protected High Frequency Waveform (PHFW) development including interoperability with legacy waveforms, system development of half-scale hub prototype, and analysis of application performance and shipboard architecture. Continue independent anti-jam and Low Probability of Detection (LPD) analysis of new PHFW, Military Standard Waveform (MSW), ancillary equipment needed for					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
HFORCE prototype implementation, and conduct legacy radio assessment for integration. Initiate development of military Transmission Security/Communications Security (TRANSEC/COMSEC) waveform architecture. Develop models to perform hardware, waveforms and system performance simulations. Demonstration of PHFW two-way communication and MSW compatibility using the prototype system will be conducted along with component and sub-component level testing and system performance simulations. Initiate PHFW and MSW integration, testing and development with half-scale hub. ***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 the HFORCE studies and completion of the three Preliminary Design Reviews (Hub and Terminal, Military Standard Waveform, and Protected High Frequency Waveform).					
Title: Automated Digital Network System (ADNS)	2.709	0.929	0.844	0.000	0.844
Articles:	-	-	-	-	-
FY 2018 Plans: Continue testing and interfacing with ENMS, IPv6 transition, and integration of SHF. Continue the IDD and integration with network applications, develop LOS link, DISN integration and development of CT piers. Investigate and recommend platform network devices, network design support to include procurement, integration and testing of the WAN. Continue network-based Cyber Security technology and virtualization of ADNS. ***FY 2019 Base Plans:*** Continue testing and interfacing with ENMS, IPv6 transition, and integration of SHF. Continue the IDD and integration with network applications, develop LOS link, DISN integration and development of CT piers. Investigate and recommend platform network devices, network design support to include procurement, integration and testing of the WAN. Continue network-based Cyber Security technology and virtualization of ADNS. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The ADNS program decrease from FY18 to FY19 reflects less system engineering effort in support of Quality of Service (QoS) development.					
Accomplishments/Planned Programs Subtotals	38.949	33.525	25.014	0.000	25.014

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/3057: *Battle Force Tactical Network (BFTN).*	3.380	1.078	11.765	-	11.765	16.272	3.960	3.983	14.890	Continuing	Continuing
• OPN/3050: *Automated Digital Network System (ADNS)*	44.191	52.336	66.309	-	66.309	66.726	64.095	60.746	62.447	Continuing	Continuing

Remarks

D. Acquisition Strategy

Battle Force Tactical Network (BFTN) - Completion of Initial Operational Test & Evaluation (IOT&E) in support of Full Rate Production (FRP) decision enabling the program to move forward with fielding additional systems.

Joint Aerial Layer Network-Maritime (JALN-M) will address capability gaps as directed by the JALN Analysis of Alternatives (AoA) by integrating a suite of technical capabilities into a single payload. Technical and acquisition support will be provided to conduct High Capacity Backbone (HCB) and Airborne Extended Data Rate (XDR) demonstrations and to develop two prototype JALN-M payloads.

High Frequency Over-the-horizon Robust Communications Enterprise (HFORCE) will address the need for protected and reliable beyond line of sight (BLOS) C4I in SATCOM-denied environments where opportunities exist to leverage shore or shipboard infrastructure to address the SATCOM-denied gap. HFORCE will address capability gaps identified during JALN-M prototype development by conducting studies to inform development of HFORCE prototype system. Technical and acquisition support will be provided to conduct BLOS HF demonstration and develop HF shore hub and protected HF waveform (PHFW).

Automated Digital Network System (ADNS): Evolutionary acquisition approach with overlapping development and implementation phases for defined INC I, II, and III baselines. INC I, II, and III will use competitively awarded contracts to implement changes consistent with acquisition initiatives. ADNS leverages Commercial-Off-The-Shelf (COTS) and Government Off-the-Shelf (GOTS) products while capitalizing on acquisition reform initiatives to achieve material savings in the logistics, installation, integration and training areas. Where feasible, differing types of advantageous contract vehicles will be used to provide flexibility, decrease contract administrative costs, and encourage acquisition streamlining through the use of COTS/GOTS products.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

E. Performance Metrics

BFTN - Complete Initial Operational Test and Evaluation (IOT&E) to determine the Operational Effectiveness and Operational Suitability of the BFTN AN/USQ-195(V)1 surface variant, when employed in its intended operational environment. This event will evaluate the capability of BFTN against its intended threats in threat-representative environments. Performance will be evaluated against defined and derived performance criteria listed in the BFTN Test and Evaluation Master Plan (TEMP). The determination of performance in specific environments, or against a specific category of threats, will provide consideration for system employment in future combat operations and contribute to the incremental improvement of future BFTN designs. The IOT&E will focus on employment of BFTN and its Command, Control and Communications (C3) capabilities in a disadvantaged communications environment (i.e., no satellite or other high-bandwidth connections available).

HFORCE - Complete technical studies, procure prototype hardware for half-scale hub, initial development stages of protected High Frequency waveform (PHFW). Develop models to perform hardware, waveforms and system performance simulations.

ADNS - Included in the ADNS program goals are the improvements to bandwidth throughput, connectivity to multiple Radio Frequency (RF) paths, greater security, and system capability delivered within a smaller form factor. The ADNS program will, at a minimum, provide bandwidth throughput enhancements resulting in an increase from 2 megabytes per
second (Mbps) to 25/50 Mbps. ADNS will also provide the ability to transport data across multiple paths simultaneously vice the current limitations of single or secondary paths. ADNS will provide greater security posture by encrypting each enclave, increasing performance of the routing and transport architecture while reducing physical footprint and cost, and securing the core via Cipher-Text.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204163N / *Fleet Tactical Development*	Project (Number/Name) 0725 / *Communication Automation*	

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	62.126	0.000		0.000		0.000		-		0.000	0.000	62.126	-
Systems Engineering-ADNS	WR	SSC : PAC/LANT	23.589	1.691	Dec 2016	0.558	Dec 2017	0.510	Dec 2018	-		0.510	Continuing	Continuing	Continuing
Systems Engineering-ADNS	WR	NUWC : Newport, RI	3.000	0.647	Dec 2016	0.184	Dec 2017	0.166	Dec 2018	-		0.166	Continuing	Continuing	Continuing
System Engineering-ADNS	C/CPFF	NUWC : Newport, RI	0.110	0.145	Mar 2017	0.046	Mar 2018	0.041	Mar 2019	-		0.041	0.000	0.342	-
Integration and Test-ADNS	C/CPFF	SSC : PAC	0.000	0.132	Mar 2017	0.046	Mar 2018	0.041	Mar 2019	-		0.041	0.000	0.219	-
Primary Hardware/ Software - HFORCE	C/FFP	MIT/Lincoln Lab : Lexington MA	0.000	0.000		23.350	Nov 2017	20.966	Nov 2018	-		20.966	Continuing	Continuing	Continuing
Primary Hardware/ Software - HFORCE TRANSEC	C/FFP	MIT/Lincoln Lab : Lexington MA	0.000	0.000		0.000		0.987	Nov 2018	-		0.987	Continuing	Continuing	Continuing
System Engineering JALN-M	MIPR	GTRI : Atlanta, GA	0.000	0.000		1.500	Mar 2018	0.000		-		0.000	0.000	1.500	-
Primary Hardware/ Software - JALN-M	C/FFP	MIT/Lincoln Lab : Lexington MA	48.655	26.678	Nov 2016	1.796	Feb 2018	0.100	Nov 2018	-		0.100	0.000	77.229	-
System Engineering JALN-M	C/CPFF	STF : San Diego,CA	3.330	1.064	Nov 2016	0.800	Feb 2018	0.200	Nov 2018	-		0.200	0.000	5.394	-
System Enginering JALN-M	WR	SSC : PAC	3.127	0.711	Jan 2017	1.851	Nov 2017	0.200	Nov 2018	-		0.200	0.000	5.889	-
		Subtotal	143.937	31.068		30.131		23.211		-		23.211	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	Various	Various : Various	11.701	0.000		0.000		0.000		-		0.000	0.000	11.701	-
System Engineering BFTN	WR	SSC : LANT	0.586	0.306	Nov 2016	0.000		0.000		-		0.000	0.000	0.892	-
System Engineering BFTN	C/CPFF	STF : San Diego, CA	0.713	0.235	Jan 2017	0.000		0.000		-		0.000	0.000	0.948	-
Travel - JALN-M	WR	PMW 170 : San Diego, CA	0.000	0.000		0.050	Jan 2018	0.000		-		0.000	0.000	0.050	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204163N / *Fleet Tactical Development*	Project (Number/Name) 0725 / *Communication Automation*	

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 BFTN	WR	SSC : PAC	0.588	0.016	Nov 2016	0.000		0.000		-		0.000	0.000	0.604	-
Development Support - HFORCE	WR	SSC : San Diego,CA	0.000	0.000		0.850	Nov 2017	1.362	Nov 2018	-		1.362	Continuing	Continuing	Continuing
System Engineering BFTN	WR	SSC : PAC	0.842	0.470	Nov 2016	0.000		0.000		-		0.000	0.000	1.312	-
Logistics Support BFTN	C/CPFF	CSA : San Diego, CA	0.436	0.363	Nov 2016	0.000		0.000		-		0.000	0.000	0.799	-
Development Support - JALN-M	C/CPFF	BAH : San Diego	4.012	0.775	Dec 2016	0.850	Dec 2017	0.000		-		0.000	0.000	5.637	-
Development Support - JALN-M	WR	SSC : PAC	2.971	1.033	Nov 2016	0.000		0.000		-		0.000	0.000	4.004	-
Financial Management Support - JALN-M	C/CPFF	Artemis : San Diego, CA	0.711	0.422	Oct 2016	0.000		0.000		-		0.000	0.000	1.133	-
Certification Authority-ADNS	C/CPFF	BAH : San Diego,CA	0.138	0.094	Jan 2017	0.095	Jan 2018	0.086	Jan 2019	-		0.086	Continuing	Continuing	Continuing
		Subtotal	22.698	3.714		1.845		1.448		-		1.448	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	Various	Various : Various	22.977	0.000		0.000		0.000		-		0.000	0.000	22.977	-
Integration and Test BFTN	C/FFP	COMOPTEVOR : Norfolk, VA	1.699	0.520	Dec 2017	0.050	Mar 2018	0.000		-		0.000	0.000	2.269	-
Test and Evaluation Support BFTN	WR	SSC : PAC	6.721	2.380	Dec 2016	0.449	Dec 2017	0.000		-		0.000	0.000	9.550	-
		Subtotal	31.397	2.900		0.499		0.000		-		0.000	0.000	34.796	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204163N / *Fleet Tactical Development*	Project (Number/Name) 0725 / *Communication Automation*	

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 - HFORCE	C/CPFF	BAH : San Diego, CA	0.000	0.000		0.600	Nov 2017	0.185	Nov 2018	-		0.185	Continuing	Continuing	Continuing
Program Management Support - JALN	C/CPFF	BAH : San Diego, CA	0.000	0.000		0.250	Jan 2018	0.000		-		0.000	0.000	0.250	-
Program Management Support - BFTN	C/CPFF	BAH : San Diego, CA	1.922	0.900	Nov 2016	0.000		0.000		-		0.000	0.000	2.822	-
Program Management Support JALN-M	C/CPFF	BAH : San Diego, CA	0.620	0.367	Nov 2016	0.000		0.000		-		0.000	0.000	0.987	-
Financial Management Support - HFORCE	C/CPFF	Artemis : San Diego, CA	0.000	0.000		0.200	Nov 2017	0.170	Nov 2018	-		0.170	Continuing	Continuing	Continuing
		Subtotal	2.542	1.267		1.050		0.355		-		0.355	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	200.574	38.949		33.525		25.014		-		25.014	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

BFTN

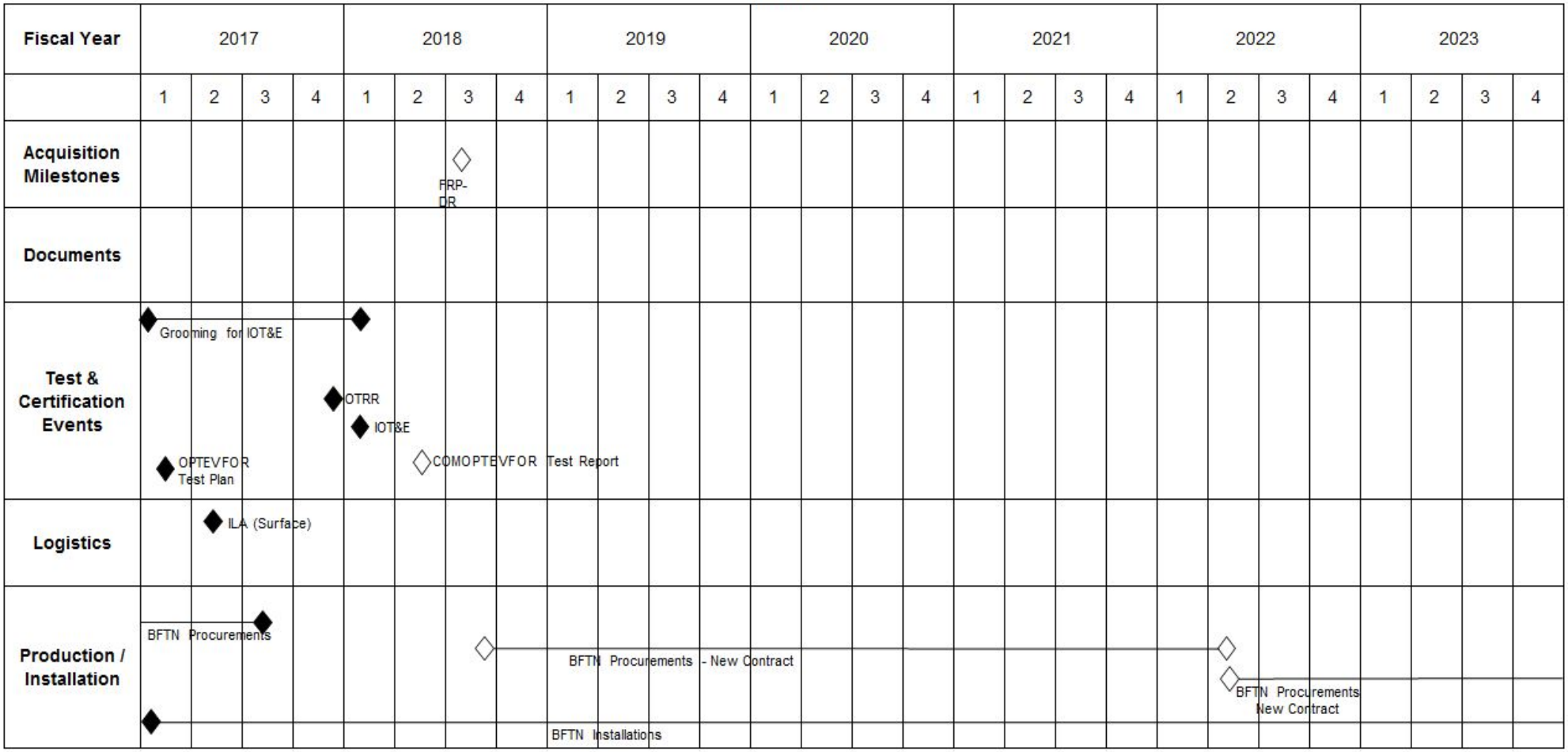


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

JALN-M Demonstration

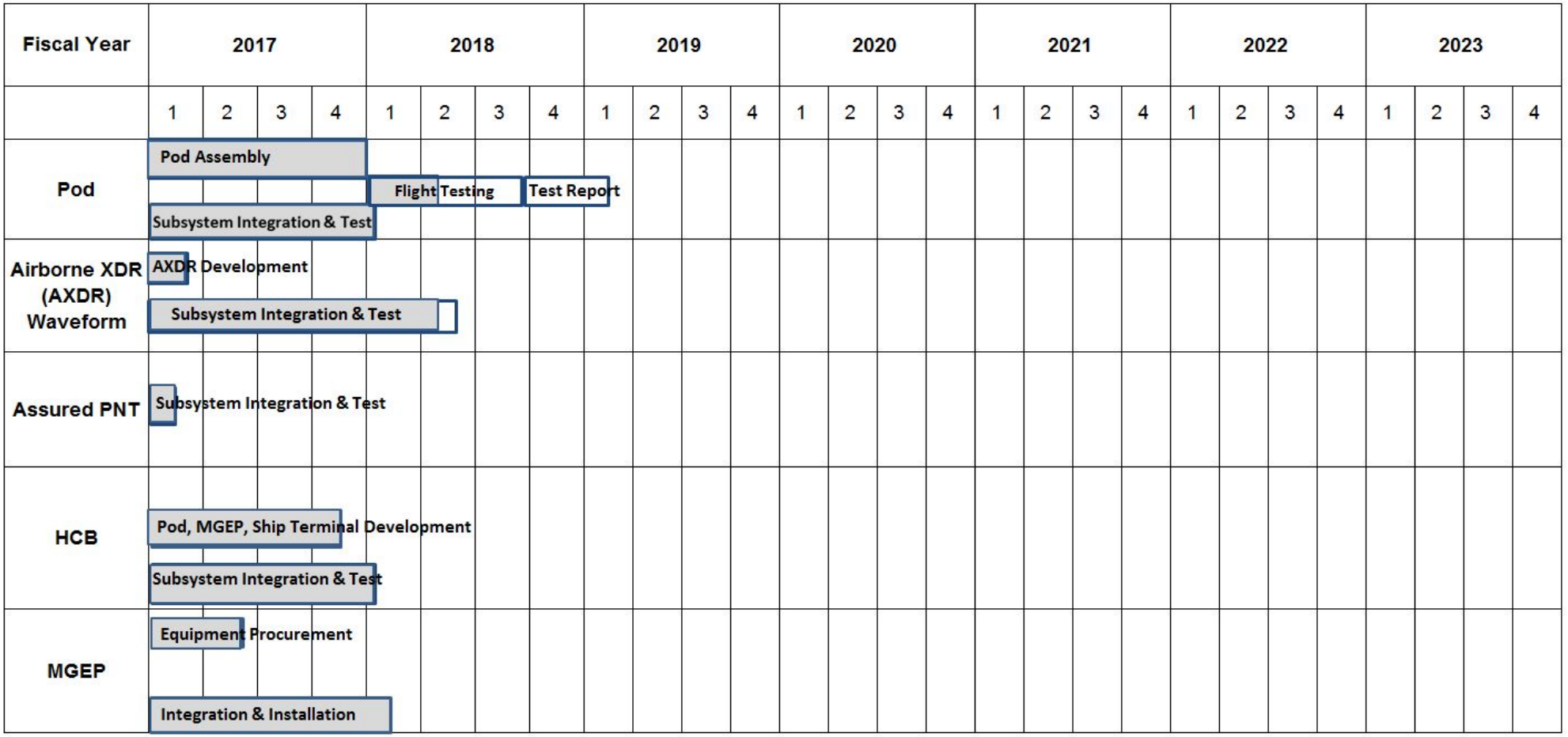


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

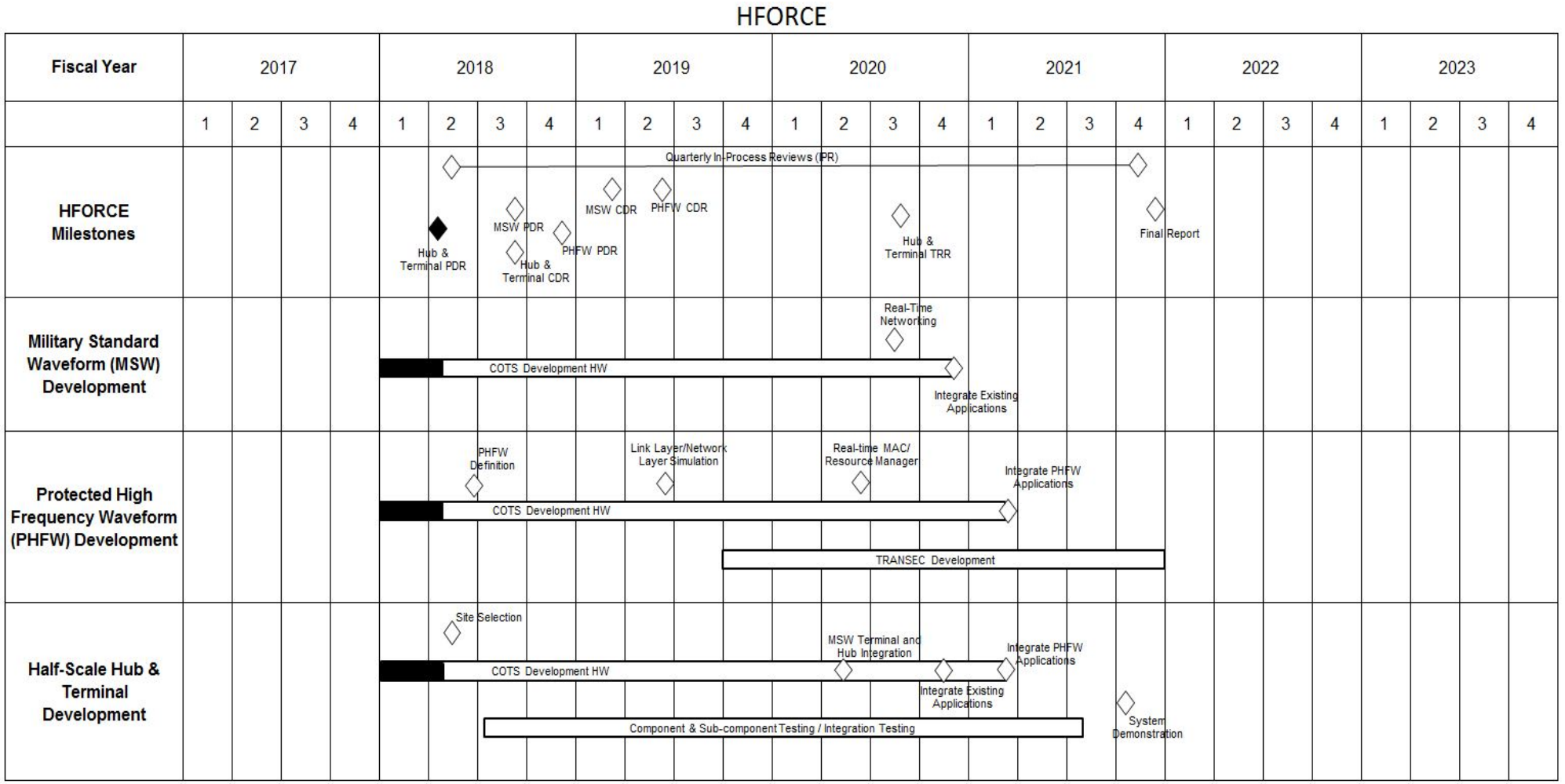


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

ADNS

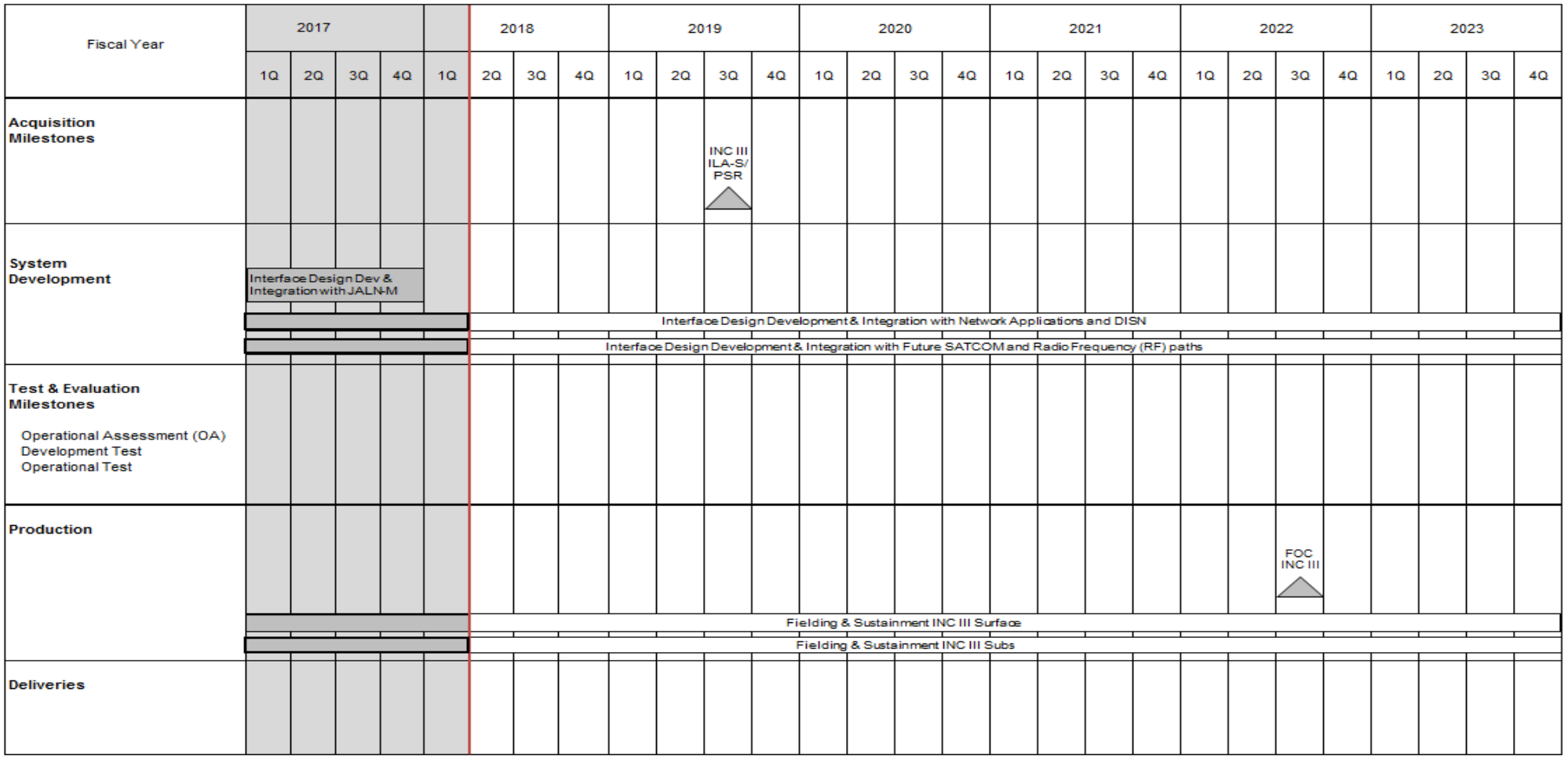


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
BFTN				
Full Rate Production Decision Review (FRP DR) Baseline System	3	2018	3	2018
Grooming for Initial Operational Test & Evaluation	1	2017	1	2018
Operational Test Readiness Review	4	2017	4	2017
Initial Operational Test & Evaluation	1	2018	1	2018
COMOPTEVFOR Test Report	2	2018	2	2018
JALN-M				
Pod Subsystem Integration & Test	1	2017	4	2017
Pod Assembly	1	2017	4	2017
Pod Flight Testing	1	2018	3	2018
A-XDR Development	1	2017	1	2017
A-XDR Integration & Test	1	2017	2	2018
PNT Subsystem Integration & Test	1	2017	1	2017
HCB Pod, MGEP, Ship Terminal Development	1	2017	4	2017
HCB Integration & Test	1	2017	4	2017
MGEP Equipment Procurement	1	2017	2	2017
MGEP Integration & Installation	1	2017	1	2018
HFORCE				
Quarterly In-Process Reviews	2	2018	4	2021
Military Standard Waveform COTS HW Development	1	2018	4	2020
Protected High Frequency Waveform COTS HW Development	1	2018	1	2021
Half-Scale Hub COTS HW Development	1	2018	1	2021
Hub & Terminal PDR	2	2018	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Hub Site Selection	2	2018	2	2018
Protected High Frequency Waveform Definition	2	2018	2	2018
Military Standard Waveform PDR	3	2018	3	2018
Hub and Terminal CDR	3	2018	3	2018
Component & Sub-component Testing/Integration Testing	3	2018	3	2021
Protected High Frequency Waveform PDR	4	2018	4	2018
TRANSEC Development	4	2019	4	2021
Military Standard Waveform CDR	1	2019	1	2019
Protected High Frequency Waveform CDR	2	2019	2	2019
Link Layer/Network Simulation	2	2019	2	2019
Real-time MAC Demonstration	2	2020	2	2020
MSW Terminal and Hub Integration	2	2020	2	2020
Hub and Terminal TRR	3	2020	3	2020
Real-time Networking	3	2020	3	2020
Existing Applications Integration	4	2020	4	2020
Protected High Frequency Waveform Integration	1	2021	1	2021
System Demonstration	4	2021	4	2021
Final Report	4	2021	4	2021
ADNS				
System Development: ADNS: Increment III_Interface Design Development and Integration with JALN-M	1	2017	4	2017
System Development: ADNS: Increment III_Interface Design Development and Integration with Network Applications and Defense Information Systems Network (DISN)	1	2017	4	2023
System Development: ADNS: Increment III_Interface Design Development and Integration with SATCOM and Radio Frequency (RF) paths	1	2017	4	2023
Production: ADNS: Increment III_Fielding and Sustainment INC III Surface	1	2017	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204163N / *Fleet Tactical Development*	**Project (Number/Name)** 0725 / *Communication Automation*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production: ADNS: Increment III_Fielding and Sustainment INC III Submarines	1	2017	4	2023
Production: ADNS: Increment III_Full Operational Capability	3	2022	3	2022
Acquisition Milestones: ADNS: Increment III Product Support Review	3	2019	3	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204228N *I Surface 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	39.821	20.595	24.829	11.661	-	11.661	23.589	23.616	15.896	15.166	Continuing	Continuing
3311: *Navigation Systems*	39.821	20.595	24.829	11.661	-	11.661	23.589	23.616	15.896	15.166	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $7.239 million to account for the availability of prior year execution balances.

The Surface support RDT&E funding will be used for the research, design, development, integration testing, and documentation of a new Inertial Navigation System (INS) AN/WSN-12 for all Navy platforms. Efforts will include analysis and planning for the alignment and evolution of Afloat Navigation Systems for surface and submarine platforms. Development of Capability Phasing Planning (CPP) processes to drive engineering analysis. The program will implement systems engineering processes to investigate major navigation system error sources, define new functions, research new technologies, algorithms, and techniques to improve system performance, conduct analyses of alternatives, create preliminary and final design concepts, develop new hardware components and associated software, and conduct land based and shipboard testing. The INS provides mission critical ship's position and attitude data to shipboard sensors (such as radars), combat systems, gun, and missile systems. The INS uses data from the Global Positioning System (GPS) to periodically update (i.e., reset) its position and internal clock. The INS is the ship's primary position source in absence of GPS. The INS WSN-12 consists of an Inertial Sensor Module (ISM) and a Navigation Processing Module (NPM) that will provide a significant improvement with respect to Attitude and Velocity data over previous INS through the use of Power Spectral Density (PSD) capability. PSD provides a tighter tolerance for error across a wider frequency range. The ISM being is designed, developed, and procured through competitive contract award to Northrop Grumman in November 2015. The NPM is a Government design. RDT&E funding will support continued system design to create a baseline for Pre-Production Units (PPU) and Low Rate Initial Production (LRIP). The system will go through Critical Design Review (CDR), Test Readiness Review (TRR), and Production Readiness Reviews (PRR). The system will go through extensive testing including Independent Validation and Verification (IV&V), Developmental Testing (DT) and Operational Testing (OT).

Cybersecurity funding will be used for the research, development, documentation and integration testing for cybersecurity hardening and enclave development for navigation systems. Efforts will include the development of boundary defense capabilities, platform specific architectures, Navy-Electronic Chart Display and Information System (Navy-ECDIS) secure solution for existing unclassified configurations and CYBERSAFE implementation. Conduct of cybersecurity risk and vulnerability assessments including development of system models, threat models, and mission models for representative groupings of Navigation systems and cyber security capabilities. Risk assessments along with requirements development will lead to incremental capability development leveraging the increment 1 EDM delivery with updated architectures and system level modifications. Follow on capabilities will be developed and added to meet existing threats and requirements.

The MK27 gyrocompass provides a backup heading reference for SSBNs and LSD platforms and has become obsolete. The AN/WSN-11 (MK27-Replacement) is a form fit function replacement that provides the same functionality while addressing the obsolescence issues of the original MK27. RDT&E funding supported the development, testing and certification of the AN/WSN-11. Development has been completed and production has transitioned to OPN funding.

Time and Frequency Distribution System-Replacement (TFDS-R) funding will be used for the research, development, documentation, and integration testing for the Submarine TFDS-R system. TFDS is a Commercial Off the Shelf (COTS) timing system utilizing the precision source signals of GPS to discipline two redundant

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204228N *I Surface Support*

Rubidium clocks to Universal Coordinated Time (UTC). TFDS provides common time to submarine equipment that utilizes clocking pulses or sinusoidal waveforms for proper operation and maintains accurate time in the event of loss of GPS input (holdover). TFDS Uses multiple input power sources for redundancy and provides a built in battery backup. TFDS generates and distributes Precision Time and Timing Interval (PTTI) reference signals to support C4I capabilities needed for Joint, Naval and Allied missions. This funding will be used to conduct a system level Analysis of Alternatives (AoA) and develop a Technical Requirements Document (TRD). These documents will support detailed analysis of the program implementation strategy to replace obsolete TFDS systems in the Fleet including appropriate documentation and contracting strategies. Planned FY19 efforts include release of development contract Request for Information.

Military GPS User Equipment (MGUE) will provide assured Positioning, Navigation and Timing (PNT) in a GPS degraded environment. Funding will be used for development of interface and performance requirements, shipboard system architecture definition, and MGUE integration into SSNs, Tomahawk, and Advanced Anti-Radiation Guided Missile (AARGM). Planned FY19 efforts include TI-22 requirements definition and HAE2 Engineering Development Model (EDM) integration.

Submarine Speed Sensors will provide investigation, development, testing, and integration of new Own-Ship Speed sensors to address new capabilities, reduce detection, and improve reliability.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	21.156	24.829	19.071	-	19.071
Current President's Budget	20.595	24.829	11.661	-	11.661
Total Adjustments	-0.561	0.000	-7.410	-	-7.410
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.561	0.000			
• Program Adjustments	0.000	0.000	-7.239	-	-7.239
• Rate/Misc Adjustments	0.000	0.000	-0.171	-	-0.171

Change Summary Explanation

The FY 2019 funding request was reduced 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 / 7					R-1 Program Element (Number/Name) PE 0204228N / *Surface Support*				Project (Number/Name) 3311 / *Navigation 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**
3311: *Navigation Systems*	39.821	20.595	24.829	11.661	-	11.661	23.589	23.616	15.896	15.166	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Surface support RDT&E funding will be used for the research, design, development, integration testing, and documentation of a new Inertial Navigation System (INS) AN/WSN-12 for all Navy platforms. Efforts will include analysis and planning for the alignment and evolution of Afloat Navigation Systems for surface and submarine platforms. Development of Capability Phasing Planning (CPP) processes to drive engineering analysis. The program will implement systems engineering processes to investigate major navigation system error sources, define new functions, research new technologies, algorithms, and techniques to improve system performance, conduct analyses of alternatives, create preliminary and final design concepts, develop new hardware components and associated software, and conduct land based and shipboard testing. The INS provides mission critical ship's position and attitude data to shipboard sensors (such as radars), combat systems, gun, and missile systems. The INS uses data from the Global Positioning System (GPS) to periodically update (i.e., reset) its position and internal clock. The INS is the ship's primary position source in absence of GPS. The INS WSN-12 consists of an Inertial Sensor Module (ISM) and a Navigation Processing Module (NPM) that will provide a significant improvement with respect to Attitude and Velocity data over previous INS through the use of Power Spectral Density (PSD) capability. PSD provides a tighter tolerance for error across a wider frequency range. The ISM being is designed, developed, and procured through competitive contract award to Northrop Grumman in November 2015. The NPM is a Government design. RDT&E funding will support continued system design to create a baseline for Pre-Production Units (PPU) and Low Rate Initial Production (LRIP). The system will go through Critical Design Review (CDR), Test Readiness Review (TRR), and Production Readiness Reviews (PRR). The system will go through extensive testing including Independent Validation and Verification (IV&V), Developmental Testing (DT) and Operational Testing (OT).

Cybersecurity funding will be used for the research, development, documentation and integration testing for cybersecurity hardening and enclave development for navigation systems. Efforts will include the development of boundary defense capabilities, platform specific architectures, Navy-Electronic Chart Display and Information System (Navy-ECDIS) secure solution for existing unclassified configurations and CYBERSAFE implementation. Conduct of cybersecurity risk and vulnerability assessments including development of system models, threat models, and mission models for representative groupings of Navigation systems and cyber security capabilities. Risk assessments along with requirements development will lead to incremental capability leveraging the increment 1 EDM delivery with updated architectures and system level modifications. Follow on capabilities will be developed and added to meet existing threats and requirements.

The MK27 gyrocompass provides a backup heading reference for SSBNs and LSD platforms and has become obsolete. The AN/WSN-11 (MK27-Replacement) is a form fit function replacement that provides the same functionality while addressing the obsolescence issues of the original MK27. RDT&E funding supported the development, testing and certification of the AN/WSN-11. Development has been completed and production has transitioned to OPN funding.

Time and Frequency Distribution System-Replacement (TFDS-R) funding will be used for the research, development, documentation, and integration testing for the Submarine TFDS-R system. TFDS is a Commercial Off the Shelf (COTS) timing system utilizing the precision source signals of GPS to discipline two redundant Rubidium clocks to Universal Coordinated Time (UTC). TFDS provides common time to submarine equipment that utilizes clocking pulses or sinusoidal waveforms for proper operation and maintains accurate time in the event of loss of GPS input (holdover). TFDS Uses multiple input power sources for redundancy and provides a built in battery backup. TFDS generates and distributes Precision Time and Timing Interval (PTTI) reference signals to support C4I capabilities needed for Joint, Naval and

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation Systems*

Allied missions. This funding will be used to conduct a system level Analysis of Alternatives (AoA) and develop a Technical Requirements Document (TRD). These documents will support detailed analysis of the program implementation strategy to replace obsolete TFDS systems in the Fleet including appropriate documentation and contracting strategies. Planned FY19 efforts include release of development contract Request for Information.

Military GPS User Equipment (MGUE) will provide assured Positioning, Navigation and Timing (PNT) in a GPS degraded environment. Funding will be used for development of interface and performance requirements, shipboard system architecture definition, and MGUE integration into SSNs, Tomahawk, and Advanced Anti-Radiation Guided Missile (AARGM). Planned FY19 efforts include TI-22 requirements definition and HAE2 Engineering Development Model (EDM) integration.

Submarine Speed Sensors will provide investigation, development, testing, and integration of new Own-Ship Speed sensors to address new capabilities, reduce detection, and improve reliability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: WSN-12 Inertial Navigation System - Replacement (INS-R)	14.619	11.803	5.291	0.000	5.291
Articles:	-	-	-	-	-
FY 2018 Plans: Conduct ISM/NPM integration testing for EDM software and hardware Conduct the ISM CDR Begin the ISM PPU build Conduct the system level WSN-12 CDR Begin development of the Integrated Logistics (ILS) documents - Life Cycle Sustainment Plan (LCSP) Begin NPM PPU EQT testing Begin ISM PPU EQT testing Begin system level EDM land based testing					
FY 2019 Base Plans: Continue NPM PPU EQT testing Continue ISM PPU EQT testing Complete ISM PPU builds Complete NPM PPU builds Start system level PPU land based performance 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 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation 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 is due to FY 2017 underexecution resulting in rephasing of FY 2019 funding.					
Title: Cybersecurity	1.918	4.804	0.500	0.000	0.500
Articles:	-	-	-	-	-
FY 2018 Plans: Develop detailed requirements for boundary defense capabilities Finalize navigation enclave construct Develop controlled interface solution for ECDIS Perform vulnerability assessment on ECDIS VMS source code Develop initial increment 1 design of the enclave boundary defense prototype DDG navigation enclave architecture					
FY 2019 Base Plans: Begin development of increment 2 capabilities of boundary defense capability					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease is due to FY 2017 underexecution resulting in rephasing of FY 2019 funding.					
Title: Time Frequency Distribution System (TFDS) Replacement	0.800	2.000	0.500	0.000	0.500
Articles:	-	-	-	-	-
FY 2018 Plans: Finalize the AoA Finalize the TRD Develop an acquisition strategy based on AoA results, brief to OPNAV resource sponsors Draft a System Acquisition Management Plan (SAMP) Complete a draft Request for Information (RFI) Begin project documentation planning/development					
FY 2019 Base Plans: Release the RFI					
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 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation 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 is due to FY 2017 underexecution resulting in rephasing of FY 2019 funding.					
Title: Military GPS User Equipment	0.000	3.906	4.420	0.000	4.420
Articles:	-	-	-	-	-
FY 2018 Plans: Development of a Technical Requirements Document (TRD) and trade studies for the Military GPS User Equipment (MGUE) integration. Development of a program acquisition strategy and accompanying documentation. Upgrade of the submarine integration lab and upgrade of the Enhanced Control Display Unit (ECDU)					
FY 2019 Base Plans: Finalize the integration plan for MGUE into the ECDU Begin MGUE card integration and software analysis Complete platform level integration studies for munitions and GPS end users					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase to support plans for integration of MGUE into ECDU.					
Title: Submarine Speed Sensors	0.491	0.800	0.250	0.000	0.250
Articles:	-	-	-	-	-
FY 2018 Plans: Complete prototype development and conduct flow tank testing.					
FY 2019 Base Plans: Prepare for At-Sea testing.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease is due to FY 2017 underexecution resulting in rephasing of FY 2019 funding.					
Title: Navigation Support	2.767	1.516	0.700	0.000	0.700
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Provide engineering, logistics, and programmatic support for, WSN-12, TFDS, Cyber security, Submarine Speed Sensor Support, and Military GPS User Equipment. ***FY 2019 Base Plans:*** Provide engineering, logistics, and programmatic support for, WSN-12, TFDS, Cyber security, Submarine Speed Sensor Support, and Military GPS User Equipment. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease is due to FY 2017 underexecution resulting in rephasing of FY 2019 funding.					
Accomplishments/Planned Programs Subtotals	20.595	24.829	11.661	0.000	11.661

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/0670: *Other Navigation*	62.970	65.943	63.330	-	63.330	84.002	83.908	74.832	76.476	Continuing	Continuing

Remarks

D. Acquisition Strategy

WSN-12 Inertial Sensor Module (ISM) CPIF/CPFF/FFP contract competitively awarded in FY 2016. Contract includes options for conducting R&D milestones, manufacture of Engineering Development Models (EDM) and Pre-Production Units (PPU), and manufacture of Low Rate Initial Production (LRIP) and Full Rate Production (FRP). Planned FY19 efforts include delivery of PPU.

E. Performance Metrics

FY17
Completed the WSN-12 Inertial Sensor Module (ISM) ISM Engineering Development Models (EDMs).
Began the WSN-12 ISM EDM and NPM EDM hardware and software integration.
WSN-12 Environmental Qualification Test (EQT) Submarine test plan completed.
Awarded the WSN-12 ISM Critical Design Review (CDR) CLIN.
Began the WSN-12 Pre Production Unit (PPU) build for the Navigation Processor Module (NPM) units
Completed the WSN-12 ISM thermal redesign effort

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation Systems*

Develop Cybersecuirty Top Level Requirements document, capabilities roadmap, and prototype deployment schedule
Continued work on the TFDS Analysis of Alternatives (AoA)
Completed first draft of the TFDS Technical Requirements Document (TRD)
Conducted a TFDS Enterprise Stakeholders Integrated Product Team (IPT) meetings
Completed the TFDS Diminishing manufacturing sources and material shortages (DMSMS) Plan
Started TFDS market research activities

FY18
Conduct WSN-12 Critical Design Review (CDR).
Develop Cybersecurity Prototype increment 1 design, ECDIS controlled interface completed design, and ECDIS source code vulnerability report.
Execute TFDS Program of Record activities.
Develop GPS MGUE TRD
Completion of GPS MGUE Trade Studies
Complete Submarine Speed Sensor temporary alteration efforts.

FY19
Complete ISM PPU builds and deliver
Complete NPM PPU builds and deliver
Start WSN-12 system level PPU land based performance testing
Receive M-Code receiver and begin early integration with HAE2 Level Card

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204228N / *Surface Support*	Project (Number/Name) 3311 / *Navigation 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
Systems Engineering/ Design	WR	SPAWAR Atlantic : Little Creek, VA	5.570	0.480	Feb 2017	3.977	Jan 2018	2.308	Jan 2019	-		2.308	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	SPAWAR Pacific : San Diego, CA	0.440	0.220	Feb 2017	0.720	Jan 2018	0.635	Jan 2019	-		0.635	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	WR Systems : Norfolk, VA	7.737	1.739	Sep 2017	3.539	Jan 2018	3.898	Jan 2019	-		3.898	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Penn State/ARL : Warminster, PA	2.550	0.925	Jun 2017	0.600	Jan 2018	0.365	Jan 2019	-		0.365	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC Dahlgren : Dahlgren, VA	0.643	0.000		0.339	Dec 2017	0.210	Jan 2019	-		0.210	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC Dam Neck : Dam Neck, VA	0.340	0.000		2.000	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC PHD : Port Hueneme, CA	0.000	0.122	Mar 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NUWC Newport : Newport, RI	0.180	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Old Dominion University : Suffolk, VA	0.450	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Northrop Grumman : Charlottesville, VA	15.338	12.204	Sep 2017	9.359	Dec 2017	2.250	Jan 2019	-		2.250	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	SPAWAR Atlantic : Charleston, SC	1.530	0.000		0.196	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC Philadelphia : Philadelphia, PA	0.110	0.440	Jun 2017	0.660	Dec 2017	0.080	Jan 2019	-		0.080	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Electric Boat : Groton, CA	0.953	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	John Hopkins, APL : Laurel, MD	0.000	1.638	May 2017	1.816	Dec 2017	0.660	Jan 2019	-		0.660	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Draper : Cambridge, MA	1.475	0.000		0.000		0.060	Jan 2019	-		0.060	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC Crane : Crane, IN	0.000	0.060	Jan 2017	0.000		0.000		-		0.000	0.000	0.060	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation 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
Systems Engineering/ Design	WR	Submarine Special Projects : Washington, DC	0.000	0.000		0.000		0.495	Jan 2019	-		0.495	0.000	0.495	-
		Subtotal	37.316	17.828		23.206		10.961		-		10.961	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
Program Management	C/CPFF	Various : Not Specified	2.505	2.767	Sep 2017	1.623	Jan 2018	0.700	Jan 2019	-		0.700	Continuing	Continuing	Continuing
		Subtotal	2.505	2.767		1.623		0.700		-		0.700	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	39.821	20.595		24.829		11.661		-		11.661	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation Systems*

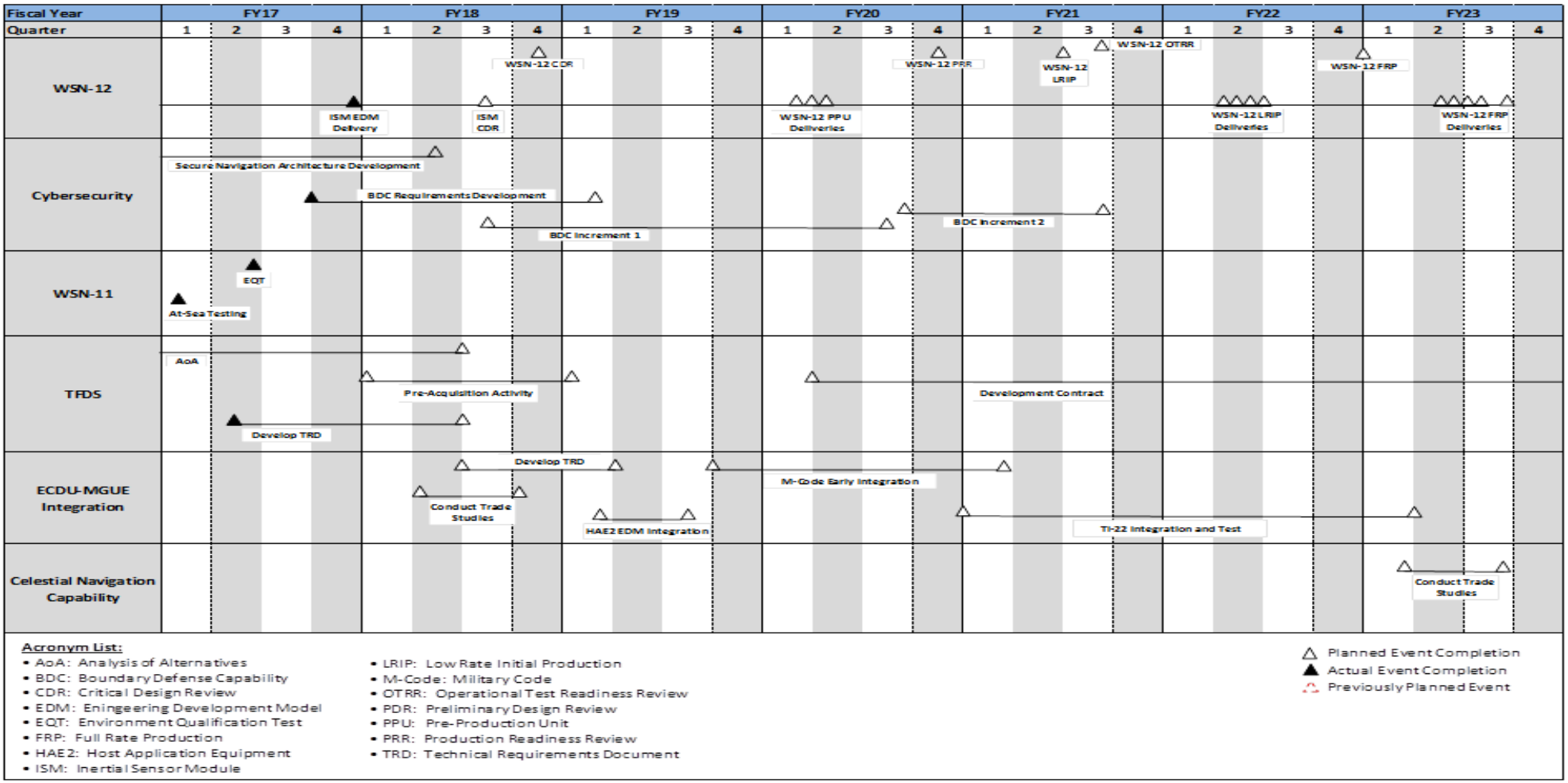


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3311				
ISM EDM Delivery	4	2017	4	2017
ISM CDR	3	2018	3	2018
WSN-12 CDR	4	2018	4	2018
WSN-12 PPU Deliveries	1	2020	2	2020
WSN-12 PRR	4	2020	4	2020
WSN-12 LRIP	2	2021	2	2021
WSN-12 OTRR	3	2021	3	2021
WSN-12 LRIP Deliveries	2	2022	2	2022
WSN-12 FRP	4	2022	4	2022
WSN-12 FRP Deliveries	2	2023	3	2023
Cybersecurity Secure Navigation Architecture Development	1	2017	2	2018
Cybersecurity BDC Requirements Development	1	2017	2	2018
Cybersecurity BDC Increment 1	3	2018	3	2020
Cybersecurity BDC Increment 2	3	2020	3	2021
WSN-11 At Sea Testing	1	2017	1	2017
WSN-11 Environmental Qualification Testing (EQT)	2	2017	2	2017
TFDS AoA	1	2017	2	2018
TFDS Develop TRD	2	2017	2	2018
TFDS Pre-Acquisition Activity	1	2018	1	2019
TFDS Development Contract	2	2020	4	2023
MGUE Trade Studies	2	2018	4	2018
MGUE Develop TRD	3	2018	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *Surface Support*	**Project (Number/Name)** 3311 / *Navigation Systems*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MGUE HAE2 EDM Integration	1	2019	3	2019
MGUE M-Code Early Integration	4	2019	1	2021
MGUE TI-22 Integration and Test	1	2021	2	2023
Celestial Navigation Capability Trade Studies	1	2023	3	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204229N *I Tomahawk Mssn Planning Ctr*							
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	3,165.116	49.149	133.617	282.395	-	282.395	223.615	170.316	50.586	52.233	Continuing	Continuing
0545: *TOMAHAWK*	3,165.116	49.149	133.617	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,347.882
4032: *A2AD*	0.000	0.000	0.000	4.835	-	4.835	4.144	0.000	0.000	0.000	0.000	8.979
4033: *M-Code*	0.000	0.000	0.000	29.013	-	29.013	26.267	7.951	3.400	3.600	Continuing	Continuing
4034: *Maritime Strike*	0.000	0.000	0.000	202.450	-	202.450	133.980	102.822	0.000	0.000	0.000	439.252
4035: *JMEWS*	0.000	0.000	0.000	22.708	-	22.708	41.226	45.543	37.021	30.765	Continuing	Continuing
4036: *TTWCS TMPC PPPI*	0.000	0.000	0.000	23.389	-	23.389	17.998	14.000	10.165	17.868	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 289

A. Mission Description and Budget Item Justification

Funds support development of the Tomahawk Weapons System (TWS) encompassing Tactical Tomahawk upgrades including initiation of baseline improvements into the Block IV weapon system, Tactical Tomahawk Weapons Controls System (TTWCS), Theater Mission Planning Center (TMPC) upgrades and other missile system improvements to maintain pace with threats. The TWS provides a long range cruise missile attack capability against fixed and mobile targets. Tomahawk is capable of being deployed from both submarines and surface ships and significantly increases the total capability of joint forces.

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 (FRP) and anticipate funding in the current or subsequent fiscal year.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	91.355	133.617	239.203	-	239.203
Current President's Budget	49.149	133.617	282.395	-	282.395
Total Adjustments	-42.206	0.000	43.192	-	43.192
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	6.600	0.000			
• SBIR/STTR Transfer	-0.467	0.000			
• Program Adjustments	-20.000	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 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0204229N *I Tomahawk Mssn Planning Ctr*			
• Rate/Misc Adjustments	0.000	0.000	43.192	-	43.192
• Congressional Directed Reductions	-28.339	-	-	-	-
Adjustments					

Change Summary Explanation

The FY 2019 funding request was reduced by $1.469 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 decrease of $1.725 due to rate and purchase inflation changes.

FY 2019 increase due to Maritime Strike Tomahawk (MST) acceleration.

As a part of PB 2019, the A2AD project (PU 4032), M-Code ACAT IVT program (PU 4033), Maritime Strike RDC (PU 4034), JMEWS ACAT III program (PU 4035), TMPC ACAT II program (PU 4036), TTWCS ACAT III program (PU 4036) and PPPI efforts (PU 4036) have been separated from the Tomahawk Mission Planning Center Project unit 0545.

Technical: Not applicable; all funding within Project Unit 0545 has been moved to separate project units to display individual program and project cost, schedule, and performance.

Schedule:

Proj: 0545 A2AD schedule changes are associated with enhanced detail required to independently display program cost, schedule, and performance within the R-4 exhibit.

Added A2AD Parking Lot Test 2Q 2018

Added M-Code ASR 4Q FY2017

Added JMEWS ASR 1Q FY2018

A2AD NAV moved from 1Q FY2016 to 4Q FY2017 to 1Q FY2018 to 4Q FY2018

Changed naming convention of A2AD (NAV/COMMS) ECPs to A2AD ECPs/Integration

Added M-Code EMD Phase 1 2Q FY2018

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204229N *I Tomahawk Mssn Planning Ctr*

Added A2AD Kit Award Lot-1 2Q FY2018

Proj: 4032 A2AD schedule changes are associated with enhanced detail required to independently display program cost, schedule, and performance within the R-4 exhibit.

Moved A2AD OTRR from 4Q FY2019 to 4Q FY2020 in accordance with A2AD Acquisition Strategy Acquisition Plan

Added A2AD Functional Ground Test 3Q FY2019

Added A2AD Operational Test (OT)4Q FY2020

Added A2AD Kit Award Lot-2 2Q FY2019

Added A2AD Kit Award Lot-3 2Q FY2020

Added A2AD Kit Award Lot-4 2Q FY2021

Added A2AD Kit Award Lot-5 2Q FY2022

Added A2AD Kit Award Lot-6 2Q FY2023

Proj: 4033 M-Code schedule changes are associated with enhanced details required to independently display program cost, schedule, and performance within the R-4 exhibit.

Added MS B 1Q FY2019

Added MS C 1Q FY2021

Added M-Code Fleet Release

Added M-Code OTRR 2Q FY2023

Added M-Code TTWCS SW Dev 1Q FY2019 to 4Q FY2023

Added M-Code DT 1Q FY2019 to 4Q FY2020

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204229N *I Tomahawk Mssn Planning Ctr*

Added M-Code OT 1Q FY2021 to 2Q FY2023

Added M-Code EMD Award Phase II 2Q FY2019

Added M-Code LRIP LOT-1 1Q FY2021

Added M-Code LRIP LOT-2 1Q FY2022

Added M-Code LRIP LOT-3 1Q FY2023

Proj: 4034 Maritime Strike schedule changes are associated with enhanced details required to independently display program cost, schedule, and performance within the R-4 exhibit.

Added Maritime Target EOC 4Q FY2019

Added Maritime Strike QRA 2Q FY2021

Added Maritime Strike Modeling and Simulation 1Q FY2019 to 3Q FY2021

Moved Maritime TTWCS Dev from 3Q FY2017 to 1Q FY2021 to 1Q FY2019 to 2Q FY2021

Moved Maritime SW Design from 3Q FY2017 to 3Q FY2019 to 1Q FY2019 to 3Q FY2019

Added MST Simulation Capability 1Q FY2020

Added MST Ready for Ground Launches 3Q FY2020

Added MST Ready for QRA 2Q FY2021

Added MST Initial Fielding 4Q FY2021

Deleted Maritime IOC QRA

Added Maritime QRA 2Q FY2021 to 4Q FY2021

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204229N *I Tomahawk Mssn Planning Ctr*

Moved Maritime Final Integration Testing from 4Q FY2019 to 1Q FY2020

Added MST Integrated Product & Test Contract Award 2Q FY2019

Added Maritime Production Contract Option 1 3Q FY2020

Moved Maritime Production Contract Option 2 from 2Q FY2021 to 3Q FY2021

Added Maritime Production Contract Option 3 3Q FY2022

Added Maritime Production Contract Award 3Q 2023

Changed naming convention of Maritime Strike Production to Maritime Production Deliveries

Moved Maritime Production Deliveries from 2Q FY2022 to 4Q FY2022 to 3Q FY2021 to 4Q FY2023.

Proj: 4035 JMEWS schedule changes are associated with enhanced details required to independently display program cost, schedule, and performance within the R-4 exhibit.

Added MS B 2Q FY2019

Added MS C 1Q FY2023

Changed naming convention from JMEWS Fuze Design/Integration to JMEWS Warhead, Fuze, Target Design Integration

Added JMEWS PDR 1Q FY2020

Added JMEWS CDR 4Q FY2020

Changed naming convention from JMEWS Integration Contract Award to JMEWS EMD Contract Award

Added JMEWS Long-Lead Energetics Award 1Q FY2022

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204229N *I Tomahawk Mssn Planning Ctr*

Proj: 4036 TTWCS TMPC PPPI schedule changes are associated with enhanced details required to independently display program cost, schedule, and performance within the R-4 exhibit.

Moved TMPC 6.0 IOC from 2Q FY2020 to 4Q FY2020

Added TMPC 7.0 IOC 4Q FY2021

Added TMPC 7.0 SW Dev & Integration 1Q FY2019 to 4Q FY2020

Added TMPC 8.0 SW Dev & Integration 1Q FY2020 to 4Q FY2022

Added TT Preplanned Product Improvement (P3I) 1Q FY2019 to 4Q FY2023

Deleted TMPC 6.0

Added TMPC 6.0 Production Acceptance Test (PAT)& DT/OT 1Q FY2019 to 4Q FY2020

Added TMPC 7.0 PAT & DT/OT 1Q FY2020 to 4Q FY2021

Added TMPC 8.0 Requirements Definition 2Q FY2019 to 4Q FY2019

Added TMPC 8.0 PAT & DT/OT 3Q FY2022 to 4Q FY2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 0545 / *TOMAHAWK*	

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
0545: *TOMAHAWK*	3,165.116	49.149	133.617	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,347.882
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 289

A. Mission Description and Budget Item Justification

The Tomahawk Weapons System (TWS), formally referred to as Tomahawk Land Attack Missile (TLAM), provides a long range cruise missile attack capability against fixed and mobile targets. This program ensures that the TWS exploits state of the art technology to preserve the efficiency of this proven weapon system, and includes all missile development, mission planning, weapons control system development, and submarine integration development.

The Tactical Tomahawk All-Up-Round (AUR) Block IV missile is a comprehensive baseline upgrade to the TWS that provides the tactical commander a quick reaction response capability as well as improved flexibility, increased accuracy and higher lethality. A five-year multi-year (FY 2004 - FY 2008) production contract was awarded in August 2004 for the production of up to 2,200 Block IV Tomahawk missiles. The essential upgrades of the Block IV missile are: improved guidance, navigation, control and mission computer two-way satellite communications (SATCOM), and a lower production cost as compared to the Block III missile. Block IV provides a Ultra High Frequency SATCOM data link to enable the missile to receive in-flight mission modification messages, to transfer health and status messages and to broadcast Battle Damage Indication messages. Block IV also includes a high anti-jam Global Positioning System (GPS) receiver, navigation improvements, and associated antenna systems. The Tomahawk program also includes development of continuing advances identified under the Tomahawk Baseline IV Operational Requirements Document (ORD), to include development of advanced warheads.

Tactical Tomahawk baseline improvements include the following: 1) Anti-Access / Area Denial (A2AD) upgrades to navigation and communication of the weapon system. These updates will allow for planned missions using Terrain Contour Matching (TERCOM)/ Digital Scene Matching Area Correlation (DSMAC)/ Vertical Update (VUP) without GPS and continued communication of the Tactical Tomahawk AUR to provide Health and Status and to allow missile redirection in-flight respectively. 2) Maritime Strike Tomahawk modernization effort provides the capability to hit moving maritime targets through mid-course guidance via a third party or seeker mode, to a terminal seeker area of uncertainty 3) M-Code upgrades the Tactical Tomahawk to the next generation GPS required to maintain reliable GPS-provided position, navigation, and timing (PNT) for the missiles and is estimated to be available for operations in FY 2023. The M-code mandate and Public Law restrict the purchase of only M-code-capable GPS User Equipment (MGUE) after FY 2017 unless a waiver is granted by the Secretary of Defense. 4) The design and integration of the Joint Multiple-Effects Warhead System (JMEWS) enables the weapon to utilize multiple lethal effects to address Hard and Deeply Buried Targets (HDBT) while increasing the TWS capabilities against Integrated Air Defense Systems (IADS) and Weapons of Mass Destruction (WMD).

The Theater Mission Planning Center (TMPC) consists of Commercial and Government Off-The-Shelf (COTS/GOTS) software and COTS hardware. TMPC is the mission planning segment of the Tomahawk Weapon System (TWS) that provides subsystems for the precision targeting, route planning, mission distribution, and strike management of Tomahawk cruise missile missions from sites located ashore and afloat. TMPC optimizes all aspects of the Tomahawk missile mission to successfully engage a target.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

TMPC provides mission planning at the theater and operational levels and is designed for high rate mission planning production responsive to national strategic, operational, and tactical requirements. TMPC develops and distributes missions; provides command information services for all variants of the Tomahawk missile; provides strike planning, execution, coordination, control and reporting, and provides Maritime Component Commanders (MCC) the capability to plan or modify conventional TWS missions. TMPC is employed in major joint combat operations and Overseas Contingency Operations. TMPC has evolved into 4 scalable configurations deployed at 187 sites: Cruise Missile Support Activities (CMSAs) (3), Tomahawk Strike Mission Planning Cells (TSMPCs) (3), Carrier Strike Groups (CSGs) (19 - 10 CVN), and Firing Units (FRUs) (143 - 85 Surface / 58 Subsurface). Additionally, TMPC is installed in Labs (6) and Training Classrooms (13) that contain various combinations of the four configurations. TMPC software development activities support new capabilities for the Tomahawk Weapon System while also decreasing mission planning time, increasing the quality and accuracy of each mission and reducing complexity. TMPC was previously referred to as Tomahawk Command and Control System (TC2S).

The Tactical Tomahawk Weapons Control System (TTWCS) provides launch capability for surface and submarine platforms. Development of the TTWCS provides a common architecture to launch the TACTOM and all variants in inventory. Development of upgrades to the TTWCS is required to meet the Department of Defense Information Technology Standards Registry, to meet FORCEnet compliance and be Internet Protocol Version 6 ready in order to remain interoperable within the Joint Service Architecture and to retain weapons system viability and usability for our Sailors. Additionally, TTWCS provides launch capability for both types of modernization efforts, A2AD (Nav/Comms) and Maritime, through an incremental approach to software and hardware upgrades. These efforts provide battle-group tactical flexibility and responsiveness while maximizing TWS wartime 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: Tactical Tomahawk All-Up-Round (AUR) and Tactical Tomahawk Weapons Control System (TTWCS)	44.512	121.986	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Continue Anti-Access/Area Denial (A2AD) navigation and communication integration into Block IV weapons system. Continue fleet experimentation and requirements coordination as well as Concept of Operations (CONOPS)/ Concept of Employment development. Continuation of the design and integration of the seeker suite into the Tactical Tomahawk (TACTOM) to be incorporated during recertification. Continuation of the cooperatively funded United States Navy/United Kingdom Joint Multi-Effects Warhead System (JMEWS) / Joint Capability Technology Demonstration (JCTD) and the commencement of fuze technology maturation and risk-reduction. Include significant research and analysis of the worldwide target set capability gaps to include Hard and Deeply Buried Targets and conventional Global Strike targets. In addition, NAWCAD also provides engine power data/analysis in order to determine reserve power available to power potential upgrades to the Tomahawk AUR, such as JMEWS. Continue development of activities associated with Military Global Positioning System User Equipment (MGUE) Insertion. In addition, the Maritime Strike Tomahawk modernization effort provides the capability to hit moving maritime targets through mid-course guidance via a third party or seeker mode, to a terminal seeker area of uncertainty in an A2AD environment.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

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: FY 2018 plans include A2AD navigation and communications transition and engineering change proposals for software and hardware development and testing to include system engineering reviews, integration, system testing and transition documentation. Includes the execution of end-to-end Tactical Tomahawk system integration testing with pre-production hardware and software to support navigation and communication upgrades required for production decision point for procurement. Finalize TTWCS v5.6 software build and enter Computer Software Configuration Item (CSCI) build Formal Qualification Testing (FQT). Develop segment test procedures and enter formal segment level testing continuing the software coding of the corrective build after the test discovery phase. Conduct TTWCS test ship certification phase and "fix it" build software development. Continue activities in support of Maritime Strike Tomahawk integration. Effort includes refinement of system requirements, specifications, and interfaces; integration engineering, laboratory simulation development, qualification of hardware and software, and captive carry flights of seeker suites by the prime; TTWCS, TMPC, and missile OES software development; lab and component-level testing. Specifically, the following items are planned for FY 2018: seeker software functionality in the Navigation & Guidance System Integration Laboratory (NAVSIL), modeling and simulation requirements defined, procure seeker hardware for test and integration, conduct Maritime Targeting Capability (MTC) flight test to affirm results of HWIL, and bench top mock-up for component integration. Coordinate with fleet stakeholders to develop TTPs and CONEMPs/CONOPs. Military-code (M Code) planned activities include Application Specific Integrated Circuit (ASIC) integration with the M Code GPS user equipment initial AGR-M testing, design reviews, requirements definition and decomposition, box-level and system-level specification finalization, interface development, and test planning. Continue JMEWS transition, integration, demonstration, and test efforts which will include fuze technology maturation and risk-reduction. Perform target and lethality assessments, engine performance analysis to include high-speed engine feasibility studies and SBIRs, data-fusion studies, campaign planning and mission analysis for potential TACTOM upgrades or new applicable weapons. Continue participation in fleet experimentation and kill chain analysis. Perform non-recurring engineering activities, systems and software development, integration and testing of capability upgrades to address emergent threats, UONS, fleet gaps, and the Tomahawk ORD as directed. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

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:*** Decrease of $121.986M from FY 2018 to FY 2019 due to the A2AD project (PU 4032), M-Code ACAT IVT program (PU 4033), Maritime Strike RDC (PU 4034), JMEWS ACAT III program (PU 4035),TTWCS ACAT III program (PU 4036) and PPPI efforts (PU 4036) being separated from the Tomahawk Mission Planning Center Project unit 0545.					
Title: Theater Mission Planning Center (TMPC)	4.637	11.631	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Development and incorporation of new capabilities into the Theater Mission Planning Center (TMPC) necessary for the employment of the Tomahawk Weapon System (TWS). ***FY 2018 Plans:*** Continue TWS navigation and accuracy and weapons delivery Circular Error Probable (CEP) studies and assessments necessary to ensure the TWS is properly employed; continued evaluation of TMPC design process to ensure Tomahawk missile performance characteristics are adequately modeled in TMPC; and continue evaluation of imagery formats resulting from nationally mandated architectural and format changes. Commence A2AD navigation and communications integration testing required to support the TWS Modernization program. Complete requirements and design and commence initial coding of Maritime Strike Tomahawk capability in support of the Maritime Strike requirement. Initiate requirements definition and preliminary design to support TWS Global Positioning System (GPS) Military-code (M-Code) upgrade necessary to enhance TWS GPS navigation and guidance. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

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 $11.631M from FY 2018 to FY 2019 due to the TMPC ACAT II program (PU 4036) being separated from the Tomahawk Mission Planning Center Project unit 0545.					
Accomplishments/Planned Programs Subtotals	49.149	133.617	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
• WPN/2101: *Tomahawk*	297.505	234.461	98.570	-	98.570	98.115	130.981	210.305	265.712	1,983.683	16,473.952
• OPN/5253: *Tomahawk Support Equipment*	67.062	73.184	92.890	-	92.890	79.187	81.059	83.612	84.201	Continuing	Continuing
• OPN/9020: *Initial and Vendor Direct Spares*	0.181	0.311	0.365	-	0.365	0.185	0.180	0.199	0.219	Continuing	Continuing
• WPN/6120: *Spares and Repair Parts*	39.815	13.518	25.096	-	25.096	23.801	19.575	18.707	22.499	Continuing	Continuing

Remarks

D. Acquisition Strategy

The TACTOM Weapon System achieved IOC in May 2004. The acquisition strategy involves maintaining production through FY 2018 with final deliveries in FY 2020. With production halting, transition into recertification starting in FY 2019 for half-life missiles. Recertification of TACTOM missiles starting in FY 2019 provides modernization opportunities to improve weapon system performance to include communication and navigation baseline improvements.

The Maritime Strike Tomahawk will employ a Rapid Deployment Capability (RDC) acquisition plan, in accordance with the DoD 5000.2, resulting in a IOC in FY 2021 following Quick Reaction Assessment (QRA) and characterization. This strategy affords the program flexibility in achieving a minimum capability in a timely manner. Following a fielding of IOC, further procurements will comply with DoD 5000.2 for programs of record.

The M-Code acquisition strategy includes the development, integration, test, qualification and production of a new GPS receiver which will satisfy the M-Code requirement with installations commencing in FY 2022. The acquisition strategy also includes M-Code upgrades to the Tactical Tomahawk Weapons Control System (TTWCS) and requires upgrades to the Theater Mission Planning Center (TMPC). Initially funded by the United States Air Force commencing in FY 2015, efforts have been underway as part of the Robust Positioning, Navigation and Timing Integrated Technology (RPNT) program and have included the interface and specification development, layout and initial design and testing required to commence integration into the Tomahawk Weapon System commencing in FY 2018.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

TMPC and TTWCS require periodic hardware and software updates to maintain compliance with IA standards and maintain system relevance against emerging threats. TMPC and TTWCS segments will rely on a blend of industry and government expertise through the remaining life of the program.

Upon completion of the Joint Multiple Effects Warhead System (JMEWS)fuze risk reduction activities in FY 2019, the program will enter the Engineering and Manufacturing Development (EMD) phase and conduct integration, System Engineering Technical Reviews (SETR), and testing activities. Additionally, corresponding updates to the Tactical Tomahawk Weapons Control System (TTWCS) and the Theatre Mission Planning Center (TMPC) will need to be made to properly launch the missile and plan for JMEWS missions. Procurement of energetics material is required before Milestone C for first LRIP lot. Operational testing is scheduled for FY 2023.

E. Performance Metrics

The Navy seeks to improve the Tomahawk cruise missile attack capability against land and maritime targets through research and development.

Examples in the area of the All-Up-Round include development of candidate warheads and sensors that will enhance weapon ability to cover all assigned target types, provide a quick reaction response capability for the weapon system, and improved guidance, navigation, control, mission computer two-way satellite communications, and a high anti-jam GPS receiver all in line with state of the art technology.

In the area of the weapons control system, research and development is performed to ensure viability and usability of the system into the future, providing necessary upgrades to meet the Department of Defense Information Technology standards registry to comply with FORCEnet requirements and be Internet Protocol Version 6 ready to remain interoperable within Joint Service Architecture, in order to provide battle-group tactical flexibility and responsiveness needed to enable full wartime capability.

In the area of the TMPC, research and development is performed in order to provide scalable configurations to deploy where and as needed to provide necessary command and control, conduct development necessary to function with national and tactical imagery architectures, support new TWS capabilities, decrease mission planning time, and increase the quality and accuracy of each mission for the TWS.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

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 - A2AD Improvements Prime Integrator (NAV/ COMMS)	SS/CPFF	Raytheon : Tucson, AZ	12.178	13.247	Feb 2017	8.133	Feb 2018	0.000		-		0.000	0.000	33.558	Continuing
Systems Engineering - TTWCS A2AD Improvements (NAV/ COMMS)	WR	NSWC : Dahlgren, VA	2.650	0.615	Feb 2017	0.847	Feb 2018	0.000		-		0.000	0.000	4.112	Continuing
Systems Engineering - Hardware Development- A2AD Improvements (NAV/COMMS)	MIPR	NRO : Chantilly, VA	21.569	12.345	Nov 2016	8.470	Nov 2017	0.000		-		0.000	0.000	42.384	Continuing
Systems Engineering- TTWCS Software Support Activity(NAV/COMMS)	SS/CPFF	LMVF : Valley Forge, PA	1.117	1.661	Apr 2017	2.817	Feb 2018	0.000		-		0.000	0.000	5.595	Continuing
M-Code - TTWCS	WR	NSWC : Dahlgren, VA	0.000	0.000		0.800	Nov 2017	0.000		-		0.000	0.000	0.800	Continuing
M-Code - AUR	C/CPFF	Raytheon : Tucson, AZ	0.000	0.000		11.849	Feb 2018	0.000		-		0.000	0.000	11.849	Continuing
M-Code- AUR	SS/FFP	Raytheon SAS : El Segundo, CA	0.000	0.000		6.006	Dec 2017	0.000		-		0.000	0.000	6.006	Continuing
M-Code	WR	NSWC-IH : Indian Head, MD	0.000	0.000		0.300	Nov 2017	0.000		-		0.000	0.000	0.300	Continuing
M-Code	WR	NUWC-RI : Newport, RI	0.000	0.000		0.200	Nov 2017	0.000		-		0.000	0.000	0.200	Continuing
M-Code	WR	NAWC-AD : Pax River, MD	0.000	0.000		0.702	Nov 2017	0.000		-		0.000	0.000	0.702	Continuing
M-Code - TMPC	SS/CPFF	Tapestry : St. Louis, MO	0.000	0.000		0.250	Dec 2017	0.000		-		0.000	0.000	0.250	Continuing
M-Code - TMPC	SS/CPFF	CommGlobal : SanJose, CA	0.000	0.000		0.500	Dec 2017	0.000		-		0.000	0.000	0.500	Continuing
Maritime Strike - TMPC	SS/CPFF	CommGlobal : San Jose, CA	0.000	0.530	Dec 2016	2.103	Dec 2017	0.000		-		0.000	0.000	2.633	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 0545 / *TOMAHAWK*	

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
Maritime Strike - TMPC	SS/CPFF	Tapestry : St. Louis, MO	0.000	0.622	Dec 2016	0.600	Dec 2017	0.000		-		0.000	0.000	1.222	Continuing
Maritime Strike - TMPC	SS/CPFF	BAE Systems : San Diego, CA	0.000	0.435	Dec 2016	0.462	Dec 2017	0.000		-		0.000	0.000	0.897	Continuing
Maritime Strike - TMPC	SS/CPFF	Leidos : California, MD	0.000	0.999	Dec 2016	0.823	Dec 2017	0.000		-		0.000	0.000	1.822	Continuing
Maritime Strike - TMPC	SS/CPFF	UARC APL : Laurel, MD	0.000	0.375	Dec 2016	0.000		0.000		-		0.000	0.000	0.375	Continuing
Maritime Strike - TMPC	WR	NAWC-AD : Pax River, MD	0.000	0.126	Nov 2016	0.606	Nov 2017	0.000		-		0.000	0.000	0.732	Continuing
Maritime Strike - TMPC	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
Maritime Strike - AUR	C/CPFF	Raytheon : Tucson, AZ	0.000	9.400	Jul 2017	59.650	Dec 2017	0.000		-		0.000	0.000	69.050	Continuing
Maritime Strike	SS/CPFF	UARC APL : Laurel, MD	0.000	0.000		0.425	Dec 2017	0.000		-		0.000	0.000	0.425	Continuing
Maritime Strike - TTWCS	WR	NSWC-DD : Dahlgren, VA	0.000	0.977	Nov 2016	0.000		0.000		-		0.000	0.000	0.977	Continuing
JMEWS - TMPC	SS/CPFF	Tapestry : St. Louis, MO	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
Maritime Strike - TTWCS	SS/CPFF	LMVF : Valley Forge, PA	0.000	1.132	Dec 2016	2.000	Dec 2017	0.000		-		0.000	0.000	3.132	Continuing
JMEWS - TMPC	SS/CPFF	BAE Systems : San Diego, CA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
Maritime Strike - AUR	WR	NAWC-WD : China Lake, CA	0.000	0.521	Nov 2016	0.000		0.000		-		0.000	0.000	0.521	Continuing
JMEWS - TMPC	SS/CPFF	Leidos : California, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
Maritime Strike - BRAT Dev	MIPR	AFRL : Dayton, OH	0.000	0.230	Jun 2017	0.000		0.000		-		0.000	0.000	0.230	Continuing
JMEWS - TMPC	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 0545 / *TOMAHAWK*	

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
JMEWS	WR	NAWC-WD : China Lake, CA	0.000	0.000		7.000	Nov 2017	0.000		-		0.000	0.000	7.000	Continuing
Prior Year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	2,660.256	0.000		0.000		0.000		-		0.000	0.000	2,660.256	-
		Subtotal	2,697.770	43.215		114.543		0.000		-		0.000	0.000	2,855.528	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
A2AD Improvements (NAV/COMMS) - Mission Planning upgrade	SS/CPFF	ComGlobal : San Jose, CA	2.043	0.170	Feb 2017	0.900	Feb 2018	0.000		-		0.000	0.000	3.113	Continuing
A2AD Improvements (NAV/COMMS) - Mission Planning upgrade	SS/CPFF	Boeing : St. Louis, MO	2.820	0.000		0.000	Feb 2018	0.000		-		0.000	0.000	2.820	Continuing
A2AD Improvements (NAV/COMMS) - Mission Planning upgrade	SS/CPFF	BAE Systems : San Diego, CA	2.850	0.000		0.000	Feb 2018	0.000		-		0.000	0.000	2.850	Continuing
A2AD Improvements (NAV/COMMS) - Mission Planning upgrade	SS/CPFF	Leidos : California, MD	4.560	0.441	Feb 2017	1.482	Feb 2018	0.000		-		0.000	0.000	6.483	Continuing
A2AD Improvements (NAV/COMMS) - Mission Planning upgrade	SS/CPFF	UARC APL : Laurel, MD	2.623	0.000		0.000	Feb 2018	0.000		-		0.000	0.000	2.623	Continuing
TLAM MP Analysis - Mission Planning	SS/CPFF	UARC APL : Laurel, MD	1.145	0.321	Feb 2017	1.067	Feb 2018	0.000		-		0.000	0.000	2.533	Continuing
Imagery Format Analysis - Mission Planning	SS/CPFF	Leidos : California, MD	5.330	0.670	Feb 2017	1.618	Feb 2018	0.000		-		0.000	0.000	7.618	Continuing
A2AD Improvements (NAV/COMMS) - Mission Planning upgrade	WR	NAWC-AD : Pax River, MD	1.019	0.005	Feb 2017	1.220	Feb 2018	0.000		-		0.000	0.000	2.244	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 0545 / *TOMAHAWK*	

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 - TTWCS AUR	WR	NSWC : Dahlgren, VA	4.067	0.000		0.520	Nov 2017	0.000		-		0.000	0.000	4.587	Continuing
Development Support - CSS AUR	SS/CPFF	Leidos : California, MD	1.539	0.000		0.000		0.000		-		0.000	0.000	1.539	Continuing
Development Support - Advanced Concepts AUR	WR	NAWC-WD : China Lake, CA	80.523	1.544	Feb 2017	1.734	Nov 2017	0.000		-		0.000	0.000	83.801	Continuing
Development Support - AUR Fleet Representative	SS/CPFF	UARC APL : Laurel, MD	0.180	0.317	Feb 2017	0.325	Nov 2017	0.000		-		0.000	0.000	0.822	Continuing
Development Support - Advanced Concepts AUR	WR	NAWC-AD : Pax River, MD	0.368	0.385	Feb 2017	0.399	Nov 2017	0.000		-		0.000	0.000	1.152	Continuing
Development Support - Advanced Concepts AUR	WR	NSWC : Dahlgren, VA	0.048	0.348	Feb 2017	0.443	Nov 2017	0.000		-		0.000	0.000	0.839	Continuing
Development Spt - CSS AUR	C/BA	Precise : Lexington Park, MD	0.000	0.180	Dec 2017	0.982	Dec 2017	0.000		-		0.000	0.000	1.162	Continuing
Development Spt - M-Code	C/BA	UARC APL : Laurel, MD	0.000	0.000		1.347	Dec 2017	0.000		-		0.000	0.000	1.347	Continuing
M-Code AUR	WR	NUWC-NPT : Newport, RI	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
M-Code AUR	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
M-Code AUR	WR	NSWC-IH : Indian Head, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
M-Code TWS	C/BA	Precise : Lexington Park, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
M-Code TTWCS	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
M-Code TTWCS	C/BA	UARC APL : Laurel, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
M-Code TTWCS	SS/CPFF	LMVF : Valley Forge, PA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
M-Code TTWCS	SS/CPFF	LMBM : Baltimore, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

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
M-Code TTWCS	WR	NUWC-NPT : Newport, RI	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
Development Spt - Maritime Strike	WR	NUWC-NPT : Newport, RI	0.000	0.188	Jun 2017	0.000		0.000		-		0.000	0.000	0.188	Continuing
Development Spt - Maritime Strike	WR	NAWC-WD : China Lake, CA	0.000	0.000		1.010	Nov 2017	0.000		-		0.000	0.000	1.010	Continuing
Development Spt - Maritime Strike	SS/CPFF	NSWC-DD : Dahlgren, VA	0.000	0.500	Jun 2017	1.980	Nov 2017	0.000		-		0.000	0.000	2.480	Continuing
Development Spt - Maritime Strike	WR	NAWC-AD : Pax River, MD	0.000	0.865	Jun 2017	1.010	Nov 2017	0.000		-		0.000	0.000	1.875	Continuing
Prior Year Support cost no longer funded in FYDP	Various	Various : Various	274.418	0.000		0.000		0.000		-		0.000	0.000	274.418	Continuing
		Subtotal	383.533	5.934		16.037		0.000		-		0.000	0.000	405.504	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
Maritime Strike	C/CPFF	Raytheon : Tucson, AZ	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
Maritime Strike	WR	NAWC-AD : China Lake, CA	0.000	0.000		1.500	Nov 2017	0.000		-		0.000	0.000	1.500	Continuing
Maritime Strike	WR	NAWC-WD : Pax River, MD	0.000	0.000		0.425	Nov 2017	0.000		-		0.000	0.000	0.425	Continuing
Maritime Strike	WR	NSWC : Dahlgren, VA	0.000	0.000		0.500	Dec 2017	0.000		-		0.000	0.000	0.500	Continuing
TTWCS	WR	NSWC-DD : Dahlgren	0.000	0.000		0.612	Dec 2017	0.000		-		0.000	0.000	0.612	Continuing
M-Code	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
A2AD Improvements (NAV/COMMS)	SS/CPFF	NSWC-IHD : Indian Head, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

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
A2AD Improvements (NAV/COMMS)	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
Prior Year T&E cost no longer funded in FYDP	Various	Various : Various	83.412	0.000		0.000		0.000		-		0.000	0.000	83.412	Continuing
		Subtotal	83.412	0.000		3.037		0.000		-		0.000	0.000	86.449	N/A

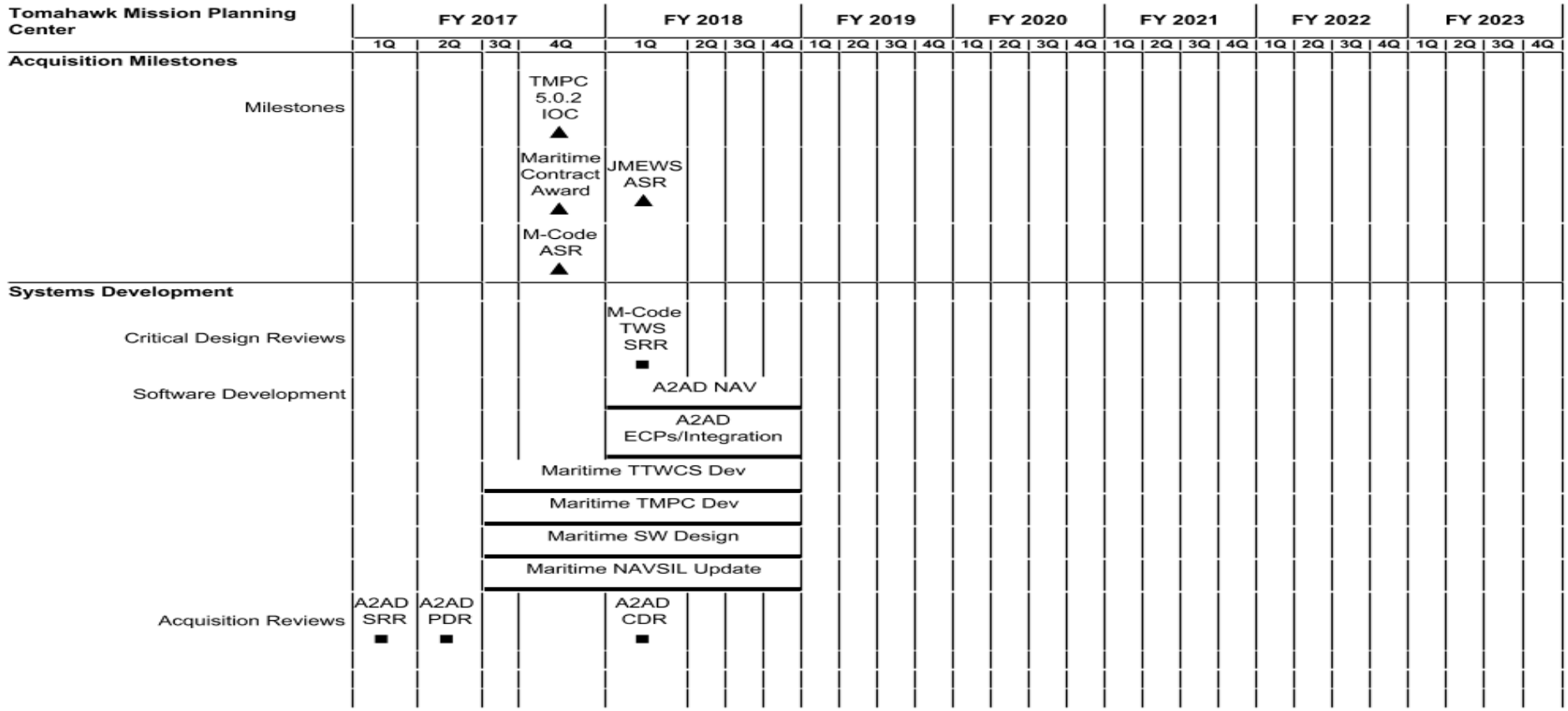
Management Services ($ in Millions)

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
M-Code	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	Continuing
Prior Year Mgmt cost no longer funded in FYDP	Various	Various : Various	0.401	0.000		0.000		0.000		-		0.000	0.000	0.401	Continuing
		Subtotal	0.401	0.000		0.000		0.000		-		0.000	0.000	0.401	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	3,165.116	49.149		133.617		0.000		-		0.000	0.000	3,347.882	N/A

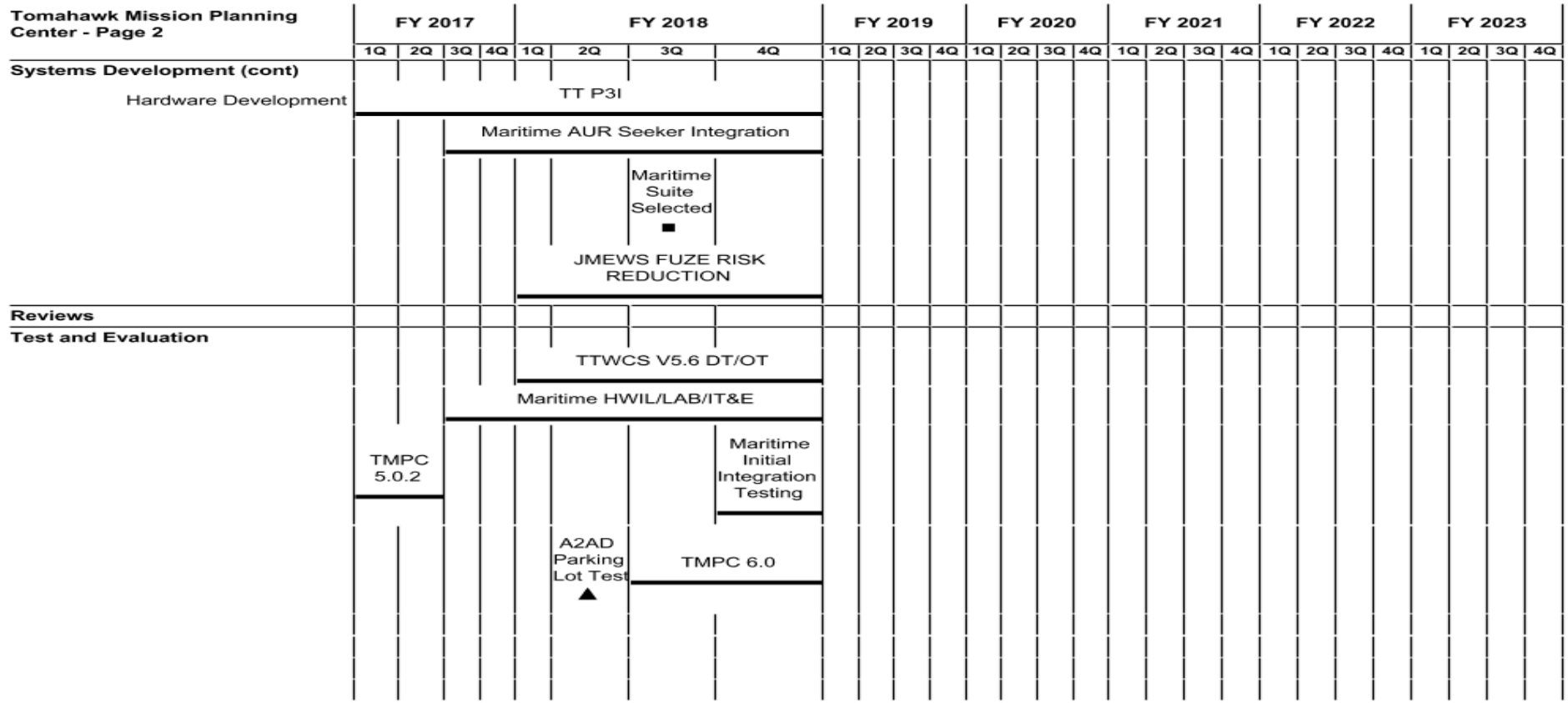
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*



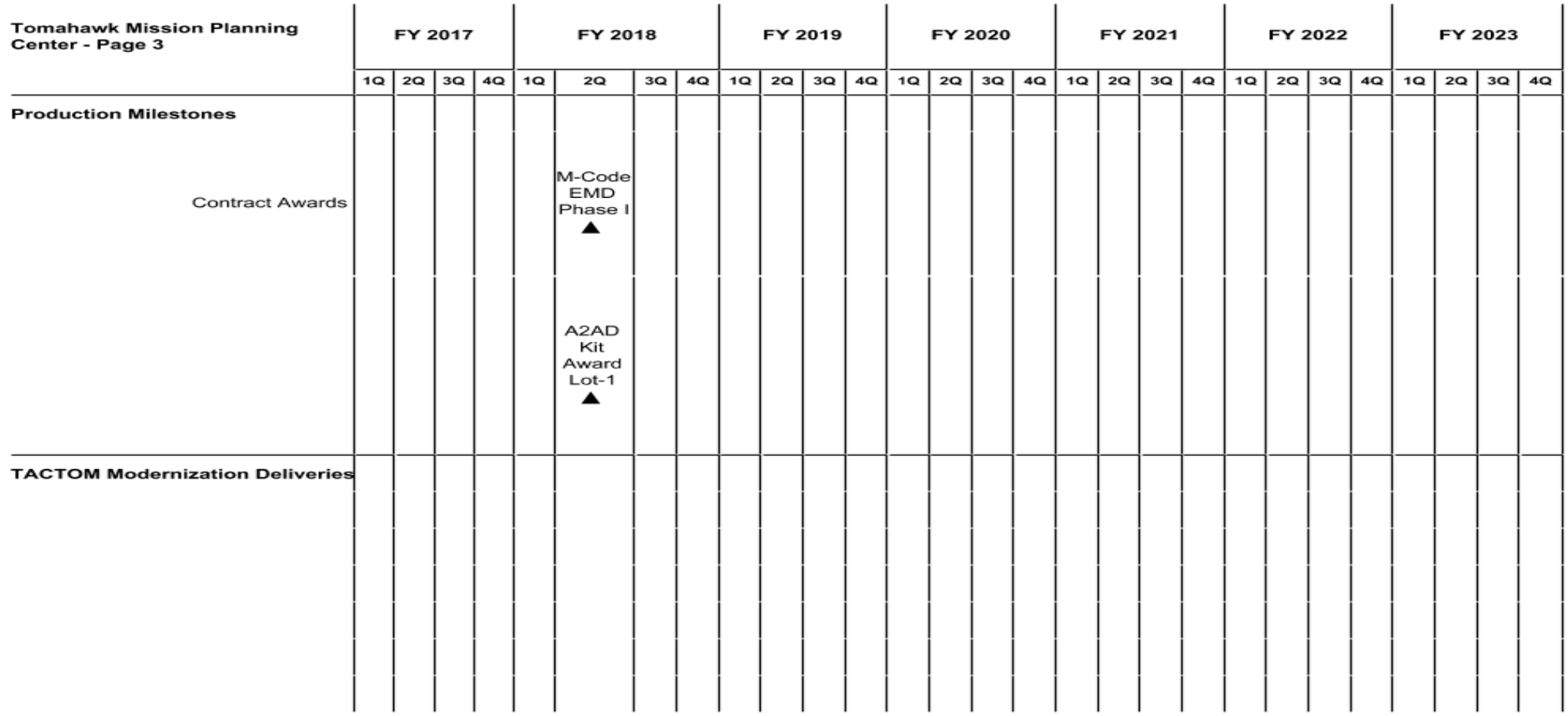
2019PB - 0204229N - 0545

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*



2019PB - 0204229N - 0545

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*



2019PB - 0204229N - 0545

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Tomahawk Mission Planning Center				
Acquisition Milestones: Milestones: TMPC 5.0.2 IOC	4	2017	4	2017
Acquisition Milestones: Milestones: Maritime Strike Contract Award	4	2017	4	2017
Acquisition Milestones: Milestones: JMEWS Acquisition Strategy Review	1	2018	1	2018
Acquisition Milestones: Milestones: M-Code Acquisition Strategy Review	4	2017	4	2017
Systems Development: Critical Design Reviews: M-CodeTWS SRR	1	2018	1	2018
Systems Development: Software Development: A2AD Navigation	1	2018	4	2018
Systems Development: Software Development: A2AD ECPs/Integration	1	2018	4	2018
Systems Development: Software Development: Maritime Strike- TTWCS Development	3	2017	4	2018
Systems Development: Software Development: Maritime Strike- TMPC Development	3	2017	4	2018
Systems Development: Software Development: Maritime Strike Software Design	3	2017	4	2018
Systems Development: Software Development: Maritime Strike NAVSIL Update	3	2017	4	2018
Systems Development: Acquisition Reviews: A2AD - SRR	1	2017	1	2017
Systems Development: Acquisition Reviews: A2AD - PDR	2	2017	2	2017
Systems Development: Acquisition Reviews: A2AD - CDR	1	2018	1	2018
Tomahawk Mission Planning Center - Page 2				
Systems Development (cont): Hardware Development: TT Preplanned Product Improvement (P3I)	1	2017	4	2018
Systems Development (cont): Hardware Development: Maritime Strike - AUR Seeker Integration	3	2017	4	2018
Systems Development (cont): Hardware Development: Maritime Strike Suite Selected	3	2018	3	2018
Systems Development (cont): Hardware Development: JMEWS FUZE RISK REDUCTION	1	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 0545 / *TOMAHAWK*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test and Evaluation: TTWCS V5.6 Modernized Missile DT/OT	1	2018	4	2018
Test and Evaluation: Maritime Strike - HWIL/LAB/Integration Testing	3	2017	4	2018
Test and Evaluation: Maritime Strike Initial Integration Testing	4	2018	4	2018
Test and Evaluation: TMPC 5.0.2	1	2017	2	2017
Test and Evaluation: TMPC 6.0	3	2018	4	2018
Test and Evaluation: A2AD Parking Lot Test	2	2018	2	2018
Tomahawk Mission Planning Center - Page 3				
Production Milestones: Contract Awards: M-Code EMD Phase I	2	2018	2	2018
Production Milestones: Contract Awards: A2AD Kit Award Lot-1	2	2018	2	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4032 / *A2AD*	

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
4032: *A2AD*	0.000	0.000	0.000	4.835	-	4.835	4.144	0.000	0.000	0.000	0.000	8.979
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 289

A. Mission Description and Budget Item Justification

This project funds Anti-Access / Area Denial (A2AD) engineering change proposal (ECP) upgrades to the navigation and communication of the Tactical Tomahawk (TACTOM). TACTOM navigation modernization will enable launch via a fine alignment solution and navigation using TERCOM/DSMAC/Vertical Update Point in a GPS denied/degraded environment. TACTOM communications development replaces 5Khz DAMA with Advanced Communication Architecture (ACA) leveraging National Technical Means (NTM), replacing the Satellite Data Link Terminal (SDLT) with an Integrated Single Box Solution (ISBS) that combines Dual Transmit and Receive Capability in a single box, replacing existing UHF antenna and adding a second band antenna.

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-Access/Area Denial	0.000	0.000	4.835	0.000	4.835
Articles:	-	-	-	-	-

FY 2018 Plans:
N/A

FY 2019 Base Plans:
FY 2019 plans include A2AD(NAV/COMMS) identification of the kit bill of materials, logistics, fabrication, assembly, integration, test, and documentation of prototype kits for the Functional Ground Test (FGT), flight test, and associated procedures. Includes the completion of the FGT and technical assessments of data collected. Continue program management and engineering support for navigation and communication system upgrades completion of the Engineering Change Proposal (ECP). Continue technical engineering support to the Integrated Single Box Solution (ISBS) radio developer and Advanced Communication Architecture (ACA) Network Service Provider. Complete the AUR System Verification Review (SVR) and Operational Test Readiness Review (OTRR).

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 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4032 / *A2AD*

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 funding was realigned from 0545 project unit. PU 4032 A2AD efforts decrease from FY 2018 $19.957M to FY 2019 $4.835M due to the completion of the A2AD CDR in FY 2018 and the commencement of the project's testing efforts in FY 2019.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	4.835	0.000	4.835

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
• WPN 2101: *Tomahawk*	297.505	234.461	98.570	-	98.570	98.115	130.981	210.305	265.712	1,983.683	16,473.952
• OPN 5253: *Tomahawk Support Equipment*	67.062	73.184	92.890	-	92.890	79.187	81.059	83.612	84.201	Continuing	Continuing
• OPN 9020: *Initial and Vendor Direct Spares*	0.181	0.311	0.365	-	0.365	0.185	0.180	0.199	0.219	Continuing	Continuing
• WPN 6120: *Spares and Repair Parts*	39.815	13.518	25.096	-	25.096	23.801	19.575	18.707	22.499	Continuing	Continuing

Remarks

D. Acquisition Strategy

Tactical Tomahawk communications and navigation development is funded via the National Reconnaissance Office (NRO) and Raytheon Missile Systems to include the development of either multiple or multi-band antennas, for the integrated single box solution radio. These changes will be incorporated during missile recertification scheduled to begin in FY 2019.

E. Performance Metrics

The Navy seeks to improve the Tomahawk cruise missile attack capability against land and maritime targets through research and development.

Examples in the area of the All-Up-Round include development of improved navigation, control, and mission computer two-way satellite communications, all in line with state of the art technology.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4032 / *A2AD*

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
A2AD Improvements Prime Integrator (NAV/ COMMS)	SS/CPFF	Raytheon : Tucson, AZ	0.000	0.000		0.000		0.750	Nov 2018	-		0.750	0.000	0.750	-
Hardware Development-A2AD Improvements (NAV/COMMS)	MIPR	NRO : Chantilly, VA	0.000	0.000		0.000		2.585	Nov 2018	-		2.585	0.000	2.585	-
		Subtotal	0.000	0.000		0.000		3.335		-		3.335	0.000	3.335	N/A

Remarks

FY 2019 A2AD Product Development funding required to continue hardware development to include the development of either multiple or multi-band antennas, for the integrated single box solution radio.

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
A2AD Development Support	WR	NAWC-AD : Pax River, MD	0.000	0.000		0.000		0.350	Nov 2018	-		0.350	0.000	0.350	-
		Subtotal	0.000	0.000		0.000		0.350		-		0.350	0.000	0.350	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
A2AD Test & Evaluation	WR	NAWC-WD : China Lake, CA	0.000	0.000		0.000		0.625	Nov 2018	-		0.625	0.000	0.625	-
A2AD Test & Evaluation	SS/CPFF	Raytheon : Tucson, AZ	0.000	0.000		0.000		0.525	Dec 2018	-		0.525	0.000	0.525	-
		Subtotal	0.000	0.000		0.000		1.150		-		1.150	0.000	1.150	N/A

Remarks

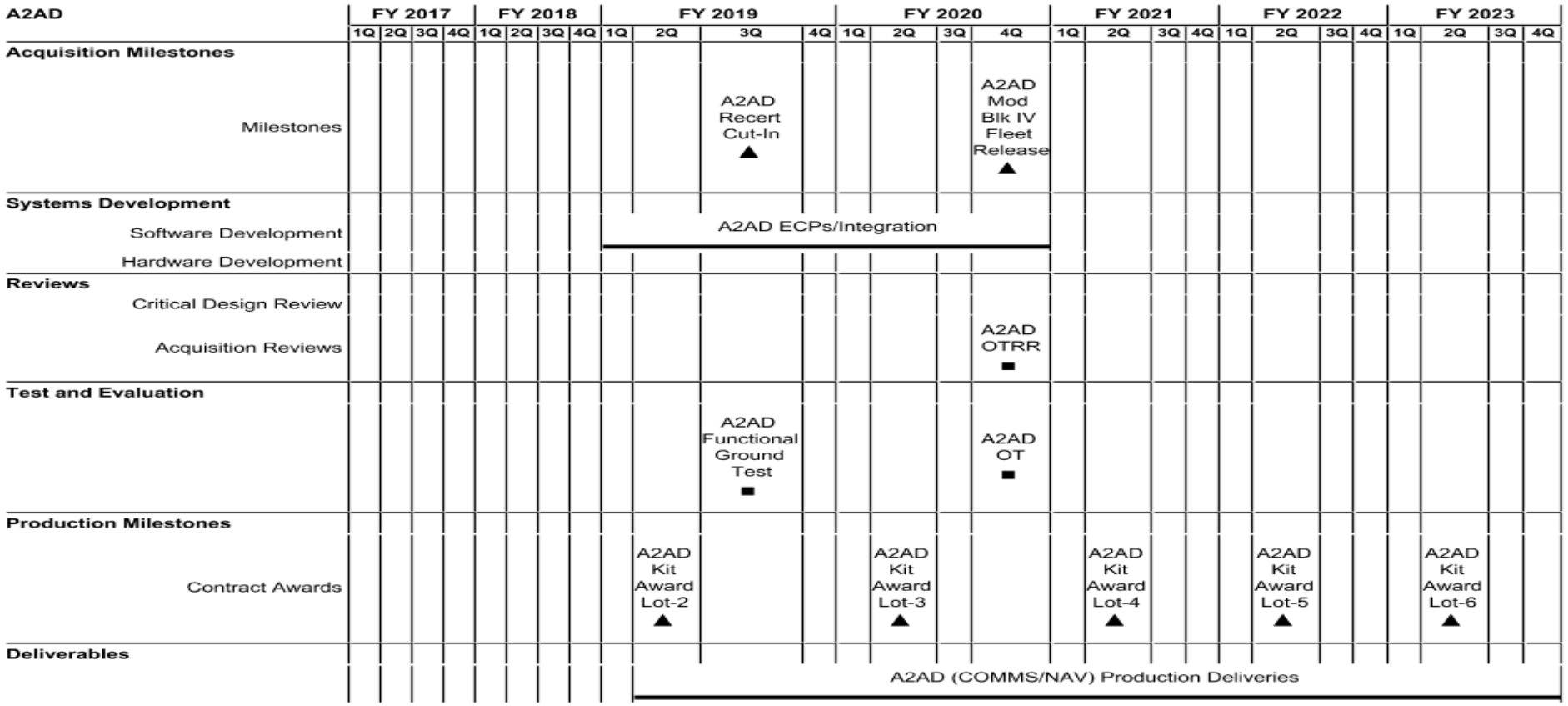
FY 2019 A2AD Test and Evaluation funding required for prototype kits for the Functional Ground Test (FGT), flight test, and associated procedures.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4032 / *A2AD*	

	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		4.835		-		4.835	0.000	4.835	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4032 / *A2AD*



2019PB - 0204229N - 4032

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4032 / *A2AD*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
A2AD				
Acquisition Milestones: Milestones: A2AD Recert Cut-In	3	2019	3	2019
Acquisition Milestones: Milestones: A2AD Modernization Blk IV Fleet Release	4	2020	4	2020
Systems Development: Software Development: A2AD Navigation/Communications ECPs/Integration	1	2019	4	2020
Reviews: Acquisition Reviews: A2AD - OTRR	4	2020	4	2020
Test and Evaluation: A2AD Functional Ground Test	3	2019	3	2019
Test and Evaluation: A2AD Operational Test	4	2020	4	2020
Production Milestones: Contract Awards: A2AD Kit Award Lot-2	2	2019	2	2019
Production Milestones: Contract Awards: A2AD Kit Award Lot-3	2	2020	2	2020
Production Milestones: Contract Awards: A2AD Kit Award Lot-4	2	2021	2	2021
Production Milestones: Contract Awards: A2AD Kit Award Lot-5	2	2022	2	2022
Production Milestones: Contract Awards: A2AD Kit Award Lot-6	2	2023	2	2023
Deliverables: A2AD (COMMS/NAV) Production Deliveries	2	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4033 / *M-Code*	

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
4033: *M-Code*	0.000	0.000	0.000	29.013	-	29.013	26.267	7.951	3.400	3.600	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The M-Code ACAT IVT program upgrades the Tactical Tomahawk to the next generation Global Positioning System (GPS) satellite constellation required to maintain GPS-provided position, navigation, and timing (PNT) for the missiles and is estimated to be available for operations in FY 2023. The M-code mandate and Public Law restrict the purchase of only M-code-capable GPS User Equipment (MGUE) after FY 2017 unless a waiver is granted by the Secretary of Defense.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: M-Code	0.000	0.000	29.013	0.000	29.013
Articles:	-	-	-	-	-

FY 2018 Plans:

N/A

FY 2019 Base Plans:

Continuation of Military-code (M Code) planned activities include performing engineering, design, fabrication, procurement, integration, testing, evaluation, and management. Engineering and design activities include requirements finalization, TWS interface development & finalization, and System Engineering Technical Reviews (SETR). Other FY19 plans include updating the Life Cycle Support Plan (LCSP); continuing design & certification of the Application Specific Integrated Circuit (ASIC) chip; fabrication, integration, testing and evaluation (IT&E) of the ASIC chip into the upgraded Anti-jam GPS Receiver (AGR-5); beginning stages of IT&E of the AGR-5 into subsystem components and the All-Up-Round (AUR) missile. FY19 will also encompass modeling and simulation of the AGR-5 in navigation simulators designed to simulate real-world M-Code, Y-Code, and jamming environments. Test vectors will be designed, developed, and finalized to guide the Modeling & Simulation (M&S) testing events. Finally, utilize a satellite simulator, to simulate the M-Code transmissions and software.

FY 2019 OCO Plans:

N/A

FY 2018 to FY 2019 Increase/Decrease Statement:

FY 2019 funding was realigned from 0545 project unit. PU 4033 M-Code increase from FY 2018 $22.0M to FY 2019 $29.0M required to continue design & certification of the Application Specific Integrated Circuit (ASIC) chip; fabrication, integration, testing and evaluation (IT&E) of the ASIC chip into the upgraded Anti-jam GPS Receiver

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4033 / *M-Code*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
(AGR-5); beginning stages of IT&E of the AGR-5 into subsystem components and the AUR missile. In addition, Test and Evaluation events will encompass modeling and simulation of the AGR-5 in navigation simulators designed to simulate real-world M-Code, Y-Code, and jamming environments. Test vectors will be designed, developed, and finalized to guide the M&S testing events.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	29.013	0.000	29.013

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 2101: *Tomahawk*	297.505	234.461	98.570	-	98.570	98.115	130.981	210.305	265.712	1,983.683	16,473.952
• OPN 5253: *Tomahawk Support Equipment*	67.062	73.184	92.890	-	92.890	79.187	81.059	83.612	84.201	Continuing	Continuing
• OPN 9020: *Initial and Vendor Direct Spares*	0.181	0.311	0.000	0.365	0.365	0.185	0.180	0.199	0.219	Continuing	Continuing
• WPN 6120: *Spares and Repair Parts*	39.815	13.518	25.096	-	25.096	23.801	19.575	18.707	22.499	Continuing	Continuing

Remarks

D. Acquisition Strategy

The M-Code acquisition strategy includes the development, integration, test, qualification and production of a new GPS receiver which will satisfy the M-Code requirement with installations commencing in FY 2022. The acquisition strategy also includes M-Code upgrades to the Tactical Tomahawk Weapons Control System (TTWCS) and requires updates to the Theater Mission Planning Center (TMPC). Initially funded by the United States Air Force commencing in FY 2015, efforts have been underway as part of the Robust Positioning, Navigation and Timing Integrated Technology (RPNT) program and have included the interface and specification development, layout and initial design and testing required to commence integration into the Tomahawk Weapon System commencing in FY 2018.

E. Performance Metrics

The Navy seeks to improve the Tomahawk cruise missile attack capability against land and maritime targets through research and development.

Examples in the area of the All-Up-Round include development of a high anti-jam GPS receiver in line with state of the art technology.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4033 / *M-Code*

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
M-Code-AUR	C/CPFF	Raytheon : Tuscon, AZ	0.000	0.000		0.000		19.195	Dec 2018	-		19.195	Continuing	Continuing	Continuing
M-Code - AUR	SS/FFP	Raytheon : Raytheon SAS: El Segundo, CA	0.000	0.000		0.000		3.485	Dec 2018	-		3.485	Continuing	Continuing	Continuing
M-Code - TTWCS	SS/CPFF	LMVF : Valley Forge, PA	0.000	0.000		0.000		0.946	Nov 2018	-		0.946	Continuing	Continuing	Continuing
M-Code - TTWCS	SS/CPFF	LMBM : Baltimore, MD	0.000	0.000		0.000		0.161	Nov 2018	-		0.161	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		23.787		-		23.787	Continuing	Continuing	N/A

Remarks

FY 2019 M-Code product development funding required to continue design & certification of the Application Specific Integrated Circuit (ASIC) chip; fabrication, integration, testing and evaluation (IT&E) of the ASIC chip into the upgraded Anti-jam GPS Receiver (AGR-5); beginning stages of IT&E of the AGR-5 into subsystem components and the AUR 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
M-Code Development Support	WR	NAWC-WD : China Lake, CA	0.000	0.000		0.000		0.133	Nov 2018	-		0.133	Continuing	Continuing	Continuing
M-Code Development Support	WR	NUWC-NPT : Newport, RI	0.000	0.000		0.000		0.886	Nov 2018	-		0.886	Continuing	Continuing	Continuing
M-Code Development Support	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		1.468	Nov 2018	-		1.468	Continuing	Continuing	Continuing
M-Code Development Support	WR	NSWC-IH : Indian Head, VA	0.000	0.000		0.000		0.697	Nov 2018	-		0.697	Continuing	Continuing	Continuing
M-Code Development Support	SS/CPFF	UARC APL : Laurel, MD	0.000	0.000		0.000		1.318	Nov 2018	-		1.318	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		4.502		-		4.502	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4033 / *M-Code*

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
M-Code Test & Evaluation	WR	NAWC-AD : Patuxent River	0.000	0.000		0.000		0.362	Nov 2018	-		0.362	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.362		-		0.362	Continuing	Continuing	N/A

Remarks

FY 2019 M-Code Test and Evaluation will encompass modeling and simulation of the AGR-5 in navigation simulators designed to simulate real-world M-Code, Y-Code, and jamming environments. Test vectors will be designed, developed, and finalized to guide the M&S testing events

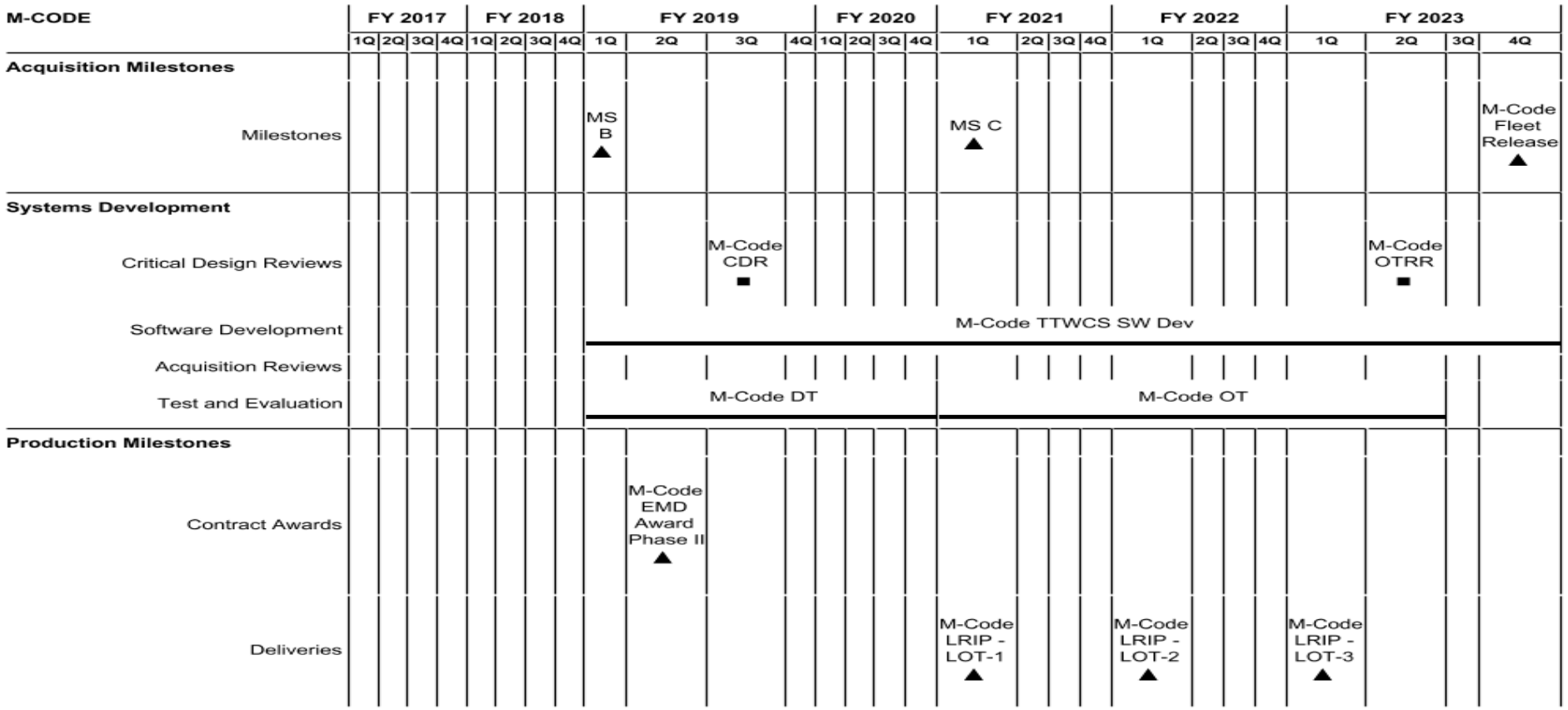
Management Services ($ in Millions)

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
M-Code	WR	NAWC-AD : Patuxent River	0.000	0.000		0.000		0.362	Nov 2018	-		0.362	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.362		-		0.362	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		29.013		-		29.013	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4033 / *M-Code*



2019PB - 0204229N - 4033

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4033 / *M-Code*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
M-CODE				
Acquisition Milestones: Milestones: Milestone B	1	2019	1	2019
Acquisition Milestones: Milestones: Milestone C	1	2021	1	2021
Acquisition Milestones: Milestones: M-Code Fleet Release	4	2023	4	2023
Systems Development: Critical Design Reviews: M-Code CDR	3	2019	3	2019
Systems Development: Critical Design Reviews: M-Code OTRR	2	2023	2	2023
Systems Development: Software Development: M-Code TTWCS Software Development	1	2019	4	2023
Systems Development: Test and Evaluation: M-Code Developmental Test	1	2019	4	2020
Systems Development: Test and Evaluation: M-Code Operational Test	1	2021	2	2023
Production Milestones: Contract Awards: M-Code EMD Award Phase II	2	2019	2	2019
Production Milestones: Deliveries: M-Code LRIP - LOT-1	1	2021	1	2021
Production Milestones: Deliveries: M-Code LRIP - LOT-2	1	2022	1	2022
Production Milestones: Deliveries: M-Code LRIP - LOT-3	1	2023	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4034 / *Maritime Strike*	

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
4034: *Maritime Strike*	0.000	0.000	0.000	202.450	-	202.450	133.980	102.822	0.000	0.000	0.000	439.252
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Maritime Strike Tomahawk modernization effort provides the capability to hit moving maritime targets through mid-course guidance via a third party or seeker mode, to a terminal seeker area of uncertainty.

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 Strike Tomahawk	0.000	0.000	202.450	0.000	202.450
Articles:	-	-	-	-	-

FY 2018 Plans:

N/A

FY 2019 Base Plans:

Continuation of activities in support of Maritime Strike Tomahawk (MST). Effort includes development of system requirements, specifications, and interfaces; integration of seeker suites, culminating in a mature hardware design with software algorithm preliminary design architecture. Continue TTWCS, TMPC, and missile software development; captive carriage flights and sensor capture events, and lab and component-level testing. Award contract for integration and test. Commence integration and testing of mature hardware design with software functionality qualification of hardware and software, missile OES software development, laboratory development of Modeling and Simulation capabilities in the lab for missile performance and algorithm maturity, and simulation updates. In addition, procure Engineering Development Models (EDMs) for the purpose of parallel testing and reducing risk while allowing for procurement of hardware components required to build kits for full system end to end testing in FY 2020.

FY 2019 OCO Plans:

N/A

FY 2018 to FY 2019 Increase/Decrease Statement:

FY 2019 funding was realigned from 0545 project unit. Increase in MST from FY 2018 $73.0M to FY 2019 $202.5M associated with development of system requirements, specifications, and interfaces; integration of seeker suites, culminating in a mature hardware design with software algorithm preliminary design architecture. Funding will procure Engineering Development Models (EDMs) for the purpose of parallel testing and reducing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4034 / *Maritime Strike*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
risk while allowing for procurement of hardware components required to build kits for full system end to end testing in FY 2020. In addition, FY 2019 funding for Test and Evaluation will commence integration and testing of mature hardware design with software functionality qualification of hardware and software, missile OES software development, laboratory development of Modeling and Simulation capabilities in the lab for missile performance and algorithm maturity, and simulation updates.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	202.450	0.000	202.450

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 2101: *Tomahawk*	297.505	234.461	98.570	-	98.570	98.115	130.981	210.305	265.712	1,983.683	16,473.952
• OPN 5253: *Tomahawk Support Equipment*	67.062	73.184	92.890	-	92.890	79.187	81.059	83.612	84.201	Continuing	Continuing
• OPN 9120: *Initial and Vendor Direct Spares*	0.181	0.311	0.365	-	0.365	0.185	0.180	0.199	0.219	Continuing	Continuing
• WPN 6120: *Spares and Repair Parts*	39.815	13.518	25.096	-	25.096	23.801	19.575	18.707	22.499	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Maritime Strike Tomahawk will employ a Rapid Deployment Capability (RDC) acquisition plan, in accordance with the DoD 5000.2, resulting in a IOC in Q4 FY 2021 following Quick Reaction Assessment (QRA) and characterization. This strategy affords the program flexibility in achieving a minimum capability in a timely manner. Following a fielding of IOC, further procurements will comply with DoD 5000.2 for programs of record.

E. Performance Metrics

The Navy seeks to improve the Tomahawk cruise missile attack capability against land and maritime targets through research and development.

Examples in the area of the All-Up-Round include development of a seeker that will enhance weapon ability to cover all assigned target types in line with state of the art technology.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4034 / *Maritime Strike*	

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
Maritime Strike - AUR	C/CPFF	Raytheon : Tucson, AZ	0.000	0.000		0.000		183.200	Dec 2018	-		183.200	0.000	183.200	-
Maritime Strike - AUR	WR	NAWCWD : China Lake, CA	0.000	0.000		0.000		1.400	Nov 2018	-		1.400	0.000	1.400	-
Maritime Strike- TTWCS	SS/CPFF	LMVF : Valley Forge, PA	0.000	0.000		0.000		3.300	Dec 2018	-		3.300	0.000	3.300	-
Maritime Strike- TTWCS	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		7.200	Nov 2018	-		7.200	0.000	7.200	-
Maritime Strike- TTWCS	WR	NUWC-DN : Newport, RI	0.000	0.000		0.000		0.700	Nov 2018	-		0.700	0.000	0.700	-
		Subtotal	0.000	0.000		0.000		195.800		-		195.800	0.000	195.800	N/A

Remarks

FY 2019 Maritime Strike funding includes development of system requirements, specifications, and interfaces; integration of seeker suites, culminating in a mature hardware design with software algorithm preliminary design architecture. Funding will procure Engineering Development Models (EDMs) for the purpose of parallel testing and reducing risk while allowing for procurement of hardware components required to build kits for full system end to end testing in FY 2020. Increase to TTWCS Product Development accelerates TTWCS IOC by one year (FY 2021).

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
Maritime Strike Development Support	WR	NAWC-WD : China Lake	0.000	0.000		0.000		3.400	Nov 2018	-		3.400	0.000	3.400	-
Martime Strike Development Support	SS/CPFF	UARC APL : Laurel, MD	0.000	0.000		0.000		0.450	Dec 2018	-		0.450	0.000	0.450	-
Maritime Strike Development Support	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		0.500	Nov 2018	-		0.500	0.000	0.500	-
Maritime Strike Development Support	WR	NAWC-AD : Pax River, MD	0.000	0.000		0.000		0.300	Nov 2018	-		0.300	0.000	0.300	-
		Subtotal	0.000	0.000		0.000		4.650		-		4.650	0.000	4.650	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4034 / *Maritime Strike*

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
Maritime Strike Test and Evaluation	WR	NAWC-WD : China Lake	0.000	0.000		0.000		1.500	Nov 2018	-		1.500	0.000	1.500	-
Maritime Strike Test and Evaluation	WR	NAWC-AD : Pax River	0.000	0.000		0.000		0.250	Nov 2018	-		0.250	0.000	0.250	-
Maritime Strike Test and Evaluation	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		0.250	Nov 2018	-		0.250	0.000	0.250	-
		Subtotal	0.000	0.000		0.000		2.000		-		2.000	0.000	2.000	N/A

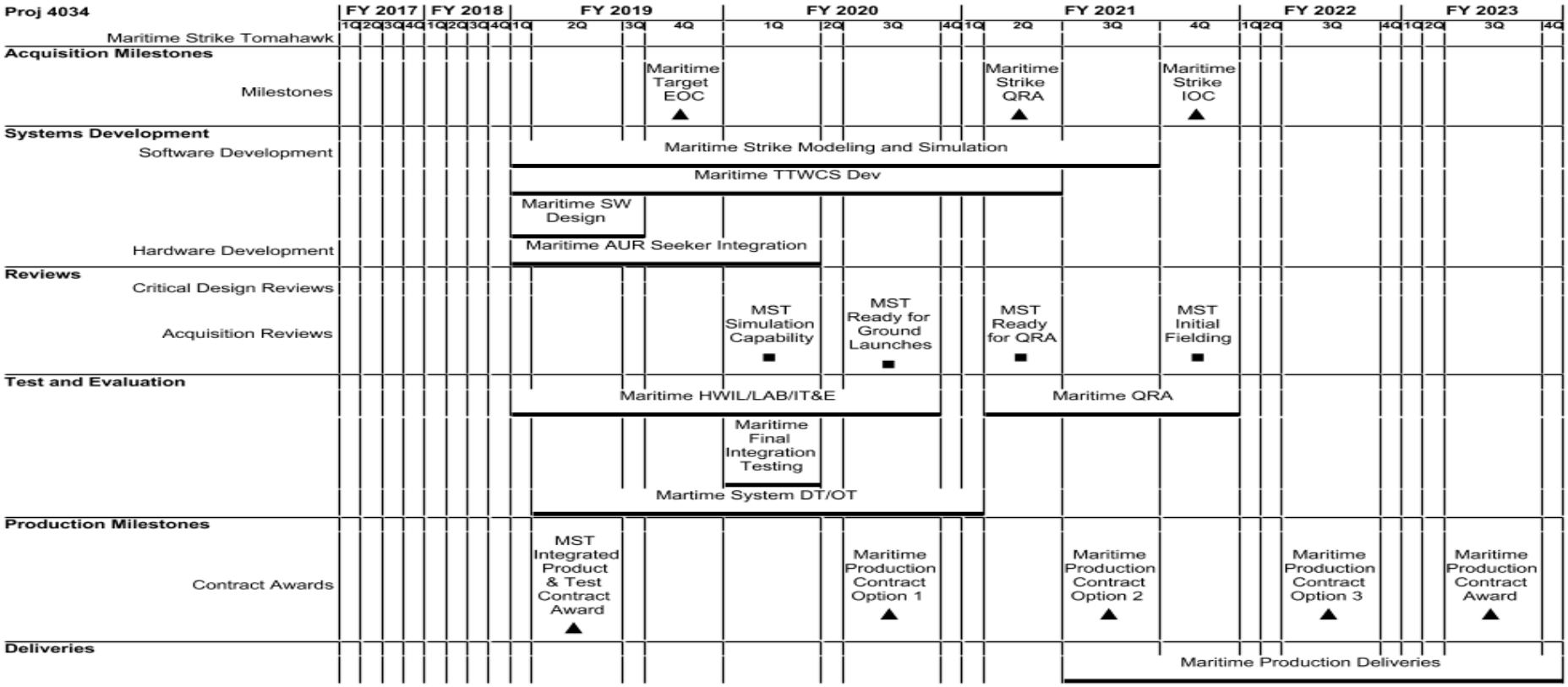
Remarks

FY 2019 Test and Evaluation Maritime Strike funding required to commence integration and testing of mature hardware design with software functionality qualification of hardware and software, missile OES software development, laboratory development of Modeling and Simulation capabilities in the lab for missile performance and algorithm maturity, and simulation updates.

	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		202.450		-		202.450	0.000	202.450	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4034 / *Maritime Strike*



2019PB - 0204229N - 4034

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4034 / *Maritime Strike*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4034				
Acquisition Milestones: Milestones: Maritime Target Capability Early Operational Capability	4	2019	4	2019
Acquisition Milestones: Milestones: Maritime Strike Initial Operational Capability	4	2021	4	2021
Acquisition Milestones: Milestones: Maritime Strike QRA	2	2021	2	2021
Systems Development: Software Development: Maritime Strike Modeling and Simulation	1	2019	3	2021
Systems Development: Software Development: Maritime Strike- TTWCS Development	1	2019	2	2021
Systems Development: Software Development: Maritime Strike Software Design	1	2019	3	2019
Systems Development: Hardware Development: Maritime Strike - AUR Seeker Integration	1	2019	1	2020
Reviews: Acquisition Reviews: Maritime Strike Simulation Capability	1	2020	1	2020
Reviews: Acquisition Reviews: Maritime Strike Ready for Ground Launches	3	2020	3	2020
Reviews: Acquisition Reviews: Maritime Strike Ready for QRA	2	2021	2	2021
Reviews: Acquisition Reviews: Maritime Strike Initial Fielding	4	2021	4	2021
Test and Evaluation: Maritime Strike - HWIL/LAB/Integration Testing	1	2019	3	2020
Test and Evaluation: Maritime Strike QRA	2	2021	4	2021
Test and Evaluation: Maritime Strike Final Integration Testing	1	2020	1	2020
Test and Evaluation: Maritime Strike Testing	2	2019	1	2021
Production Milestones: Contract Awards: MST Integrated Product & Test Contract Award	2	2019	2	2019
Production Milestones: Contract Awards: Maritime Strike Production Contract Award LRIP-1	3	2020	3	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4034 / *Maritime Strike*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Contract Awards: Maritime Strike Production Contract Award LRIP-2	3	2021	3	2021
Production Milestones: Contract Awards: Maritime Strike Production Contract Award LRIP-3	3	2022	3	2022
Production Milestones: Contract Awards: Maritime Strike Production Contract Award LRIP-4	3	2023	3	2023
Deliveries: Maritime Strike Production Deliveries	3	2021	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4035 / *JMEWS*	

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
4035: *JMEWS*	0.000	0.000	0.000	22.708	-	22.708	41.226	45.543	37.021	30.765	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Multiple-Effects Warhead System (JMEWS) ACAT III program enables the Tactical Tomahawk to utilize multiple lethal effects to address Hard and Deeply Buried Targets (HDBT) while increasing the Tomahawk Weapon System (TWS) capabilities against Integrated Air Defense Systems (IADS) and Weapons of Mass Destruction (WMD).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: JMEWS	0.000	0.000	22.708	0.000	22.708
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: JMEWS planned activities include completion of the fuze risk reduction efforts, and completing Milestone B to enter the Engineering and Manufacturing Development phase. Fuze risk reduction will culminate in sled testing. Initial Engineering and Manufacturing Design (EMD) efforts include continuation of hardware and software development, performing fuze and warhead integration, performing subscale testing required to improve lethality modeling capabilities, and system engineering reviews. Update Tomahawk Test and Evaluation Master Plan.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding was realigned from 0545 project unit. Increase in JMEWS from FY 2018 $7.0M to FY 2019 $22.7M due to product development efforts required to complete fuze risk reduction efforts culminating in sled testing. Initial Engineering and Manufacturing Design (EMD) efforts include continuation of hardware and software development, performing fuze and warhead integration, performing subscale testing required to improve lethality modeling capabilities, and system engineering reviews.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	22.708	0.000	22.708

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4035 / *JMEWS*

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 2101: *Tomahawk*	297.505	234.461	98.570	-	98.570	98.115	130.981	210.305	265.712	1,983.683	16,473.952
• OPN 5253: *Tomahawk Support Equipment*	67.062	73.184	92.890	-	92.890	79.187	81.059	83.612	84.201	Continuing	Continuing
• OPN 9020: *Initial and Vendor Direct Spares*	0.181	0.311	0.000	0.365	0.365	0.185	0.180	0.199	0.219	Continuing	Continuing
• WPN 6120: *Spares and Repair Parts*	39.815	13.518	25.096	-	25.096	23.801	19.575	18.707	22.499	Continuing	Continuing

Remarks

D. Acquisition Strategy

Upon completion of the Joint Multiple Effects Warhead System (JMEWS) fuze risk reduction activities in FY 2019, the program will enter the Engineering and Manufacturing Development (EMD) phase and conduct integration, Systems Engineering Technical Review (SETR), and testing activities. Additionally, corresponding updates to the Tactical Tomahawk Weapons Control System (TTWCS) and the Theatre Mission Planning Center (TMPC) will need to be made to properly launch the missile and plan for JMEWS missions. Procurement of energetics material is required before Milestone (MS) C for first LRIP lot. Operational testing is scheduled for FY 2023.

E. Performance Metrics

The Navy seeks to improve the Tomahawk cruise missile attack capability against land targets through research and development.

Examples in the area of the All-Up-Round include development of candidate warheads that will enhance weapon ability to cover all assigned target types in line with state of the art technology.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4035 / *JMEWS*

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
JMEWS	SS/CPFF	Raytheon : Tucson, AZ	0.000	0.000		0.000		15.500	Dec 2018	-		15.500	Continuing	Continuing	Continuing
JMEWS	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		0.000		1.100	Nov 2018	-		1.100	Continuing	Continuing	Continuing
JMEWS	WR	NAWC-WD : China Lake, CA	0.000	0.000		0.000		5.000	Nov 2018	-		5.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		21.600		-		21.600	Continuing	Continuing	N/A

Remarks

FY 2019 JMEWS product development efforts are required to complete fuze risk reduction efforts to culminate in sled testing.

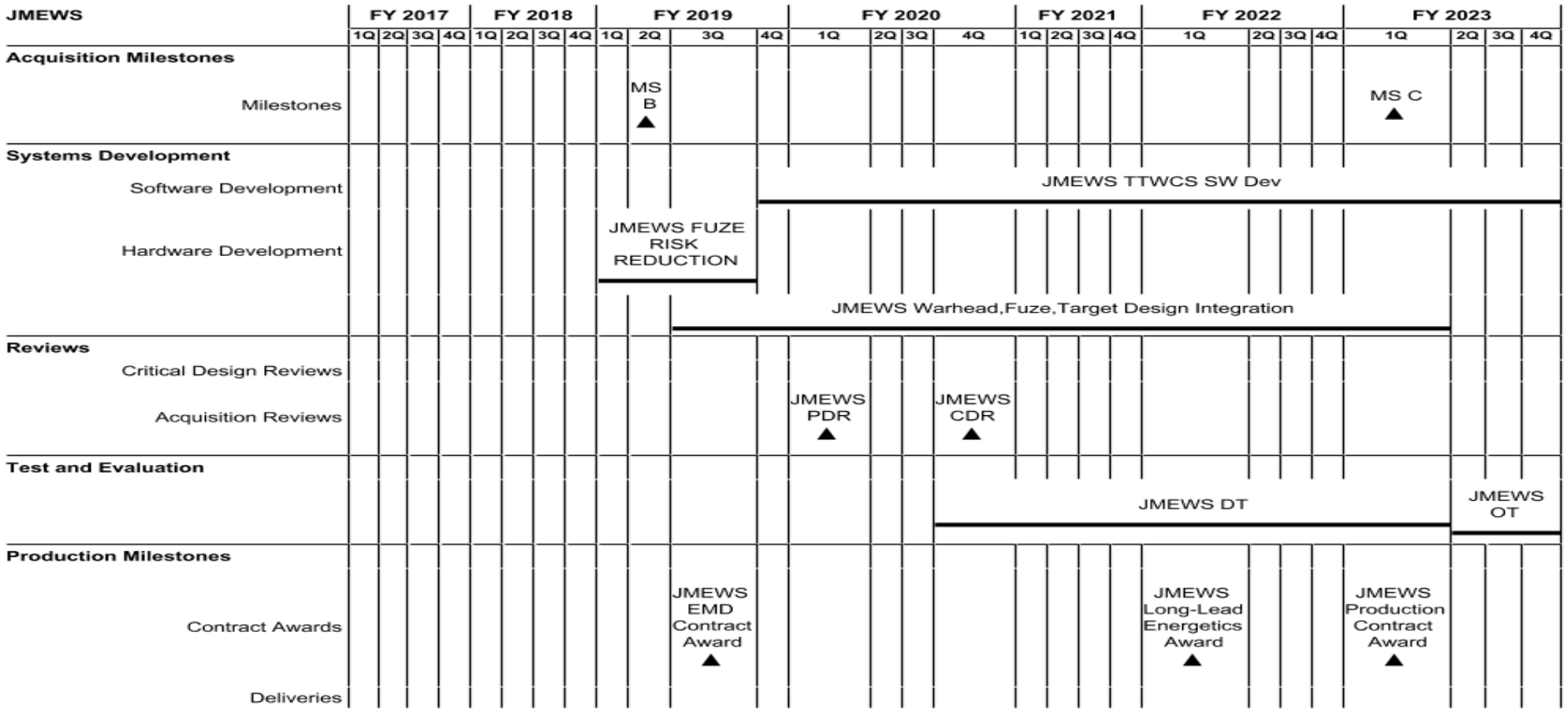
Support ($ in Millions)

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
JMEWS Development Support	SS/CPFF	UARC-APL : Laurel, MD	0.000	0.000		0.000		0.500	Nov 2018	-		0.500	Continuing	Continuing	Continuing
JMEWS Development Support	WR	NSWC-IH : Indian Head, MD	0.000	0.000		0.000		0.300	Nov 2018	-		0.300	Continuing	Continuing	Continuing
JMEWS Development Support	WR	NSWC-DD : Dahlgren, VA	0.000	0.000		0.000		0.308	Nov 2018	-		0.308	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.108		-		1.108	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		22.708		-		22.708	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4035 / *JMEWS*



2019PB - 0204229N - 4035

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4035 / *JMEWS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
JMEWS				
Acquisition Milestones: Milestones: Milestone B	2	2019	2	2019
Acquisition Milestones: Milestones: Milestone C	1	2023	1	2023
Systems Development: Software Development: JMEWS TTWCS SW Dev	4	2019	4	2023
Systems Development: Hardware Development: JMEWS FUZE RISK REDUCTION	1	2019	3	2019
Systems Development: Hardware Development: JMEWS Warhead,Fuze,Target Design Integration	3	2019	1	2023
Reviews: Acquisition Reviews: JMEWS PDR	1	2020	1	2020
Reviews: Acquisition Reviews: JMEWS CDR	4	2020	4	2020
Test and Evaluation: JMEWS DT	4	2020	1	2023
Test and Evaluation: JMEWS OT	2	2023	4	2023
Production Milestones: Contract Awards: JMEWS EMD Contract Award	3	2019	3	2019
Production Milestones: Contract Awards: JMEWS Long-Lead Energetics Award	1	2022	1	2022
Production Milestones: Contract Awards: JMEWS Production Contract Award	1	2023	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4036 / *TTWCS TMPC PPPI*	

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
4036: *TTWCS TMPC PPPI*	0.000	0.000	0.000	23.389	-	23.389	17.998	14.000	10.165	17.868	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Pre-Planned Product Improvement (P3I) funding is required to create an integrated future strategy across the Tomahawk Weapon System. This includes identifying potential capability upgrades, advanced technologies, and new requirements resulting from target and lethality assessments, engine performance analysis, data-fusion studies, campaign planning, mission analysis, fleet experimentation and kill chain analysis. Perform nonrecurring engineering activities, systems and software development, integration and testing of capability upgrades to address emergent threats, Urgent Operational Needs (UONS), fleet gaps, and the Tomahawk Operational Readiness Document (ORD).

The Theater Mission Planning Center (TMPC) consists of Commercial and Government Off-The-Shelf (COTS/GOTS) software and COTS hardware. TMPC is the mission planning segment of the Tomahawk Weapon System (TWS) that provides subsystems for the precision targeting, route planning, mission distribution, and strike management of Tomahawk cruise missile missions from sites located ashore and afloat. TMPC optimizes all aspects of the Tomahawk missile mission to successfully engage a target.

TMPC provides mission planning at the theater and operational levels and is designed for high rate mission planning production responsive to national strategic, operational, and tactical requirements. TMPC develops and distributes missions; provides command information services for all variants of the Tomahawk missile; provides strike planning, execution, coordination, control and reporting, and provides Maritime Component Commanders (MCC) the capability to plan or modify conventional TWS missions. TMPC is employed in major joint combat operations and Overseas Contingency Operations. TMPC has evolved into 4 scalable configurations deployed at 187 sites: Cruise Missile Support Activities (CMSAs) (3), Tomahawk Strike Mission Planning Cells (TSMPCs) (3), Carrier Strike Groups (CSGs) (19 - 10 CVN), and Firing Units (FRUs) (143 - 85 Surface / 58 Subsurface). Additionally, TMPC is installed in Labs (6) and Training Classrooms (13) that contain various combinations of the four configurations. TMPC software development activities support new capabilities for the Tomahawk Weapon System while also decreasing mission planning time, increasing the quality and accuracy of each mission and reducing complexity. TMPC was previously referred to as Tomahawk Command and Control System (TC2S).

The Tactical Tomahawk Weapons Control System (TTWCS) provides launch capability for surface and submarine platforms. Development of the TTWCS provides a common architecture to launch the TACTOM and all variants in inventory. Development of upgrades to the TTWCS is required to meet the Department of Defense Information Technology Standards Registry, to meet FORCEnet compliance and be Internet Protocol Version 6 ready in order to remain interoperable within the Joint Service Architecture and to retain weapons system viability and usability for our Sailors. Additionally, TTWCS provides launch capability for both types of modernization efforts, A2AD (Nav/Comms) and Maritime, through an incremental approach to software and hardware upgrades. These efforts provide battle-group tactical flexibility and responsiveness while maximizing TWS wartime capability.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4036 / *TTWCS TMPC PPPI*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Theater Mission Planning Center (TMPC)	0.000	0.000	20.664	0.000	20.664
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Continue TWS navigation and accuracy and weapons delivery CEP studies and assessments necessary to ensure the TWS is properly employed; continued evaluation of TMPC design process to ensure Tomahawk missile performance characteristics are adequately modeled in TMPC; and continue evaluation of imagery formats resulting from nationally mandated architectural and format changes. Conduct A2AD navigation and communications system product acceptance testing (PAT) at the TWS level required to support the TWS Modernization program. Conduct software development and start system integration and testing of Maritime Strike Tomahawk capability. Conduct requirements definition for the TWS GPS M-Code upgrade necessary to enhance TWS GPS navigation and guidance. Conduct requirements definition and preliminary design to support TWS Joint Multiple Effects Warhead System (JMEWS) transition, demonstration and test efforts.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding was realigned from 0545 project unit. Increase from FY 2018 of $11.6M to FY 2019 of $23.2M funds JMEWS initial requirements definition for insertion into the Tomahawk Weapon System.					
Title: Tactical Tomahawk Weapons Control System (TTWCS)	0.000	0.000	2.725	0.000	2.725
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Continue TTWCS software development efforts necessary to enable Tomahawk navigation and communications modernization. Conduct integration and functional testing for TTWCS v5.6 which includes A2AD navigation and modernization improvements. Correct and verify software deficiencies found in segment testing and develop					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4036 / *TTWCS TMPC PPPI*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
final software "fix-it" build for system level test events. Continue TTWCS ship test, ship certifications and prepare for operational test events. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 funding was realigned from 0545 project unit. Funding levels associated with the TTWCS program have remained stable from FY 2018 to FY 2019 and are required to conduct development efforts to provide launch capability to A2AD (Nav/Comms) and conduct PPPI engineering activities, system and software development, integration and testing of capability upgrades to address emergent threats, UONS, fleet gaps, and the Tomahawk ORD.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	23.389	0.000	23.389

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 5253: *Tomahawk Support Equipment*	67.062	73.184	92.890	-	92.890	79.187	81.059	83.612	84.201	Continuing	Continuing
• OPN 9020: *Initial and Vendor Direct Spares*	0.181	0.311	0.374	-	0.374	0.281	0.231	0.204	0.000	Continuing	Continuing
• WPN 2101: *Tomahawk*	297.505	234.461	98.570	-	98.570	98.115	130.981	210.305	265.712	1,983.683	16,473.952
• WPN 6120: *Spares and Repair Parts*	62.383	110.255	135.688	-	135.688	133.450	131.911	143.868	146.315	Continuing	Continuing

Remarks

D. Acquisition Strategy

TMPC and TTWCS require periodic hardware and software updates to maintain compliance with Information Assurance (IA) standards and maintain system relevance against emerging threats. TMPC and TTWCS segments will rely on a blend of industry and government expertise through the remaining life of the program.

E. Performance Metrics

In the area of the weapons control system, research and development is performed to ensure viability and usability of the system into the future, providing necessary upgrades to meet the Department of Defense Information Technology standards registry to comply with FORCEnet requirements and be Internet Protocol Version 6

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4036 / *TTWCS TMPC PPPI*

ready to remain interoperable within Joint Service Architecture, in order to provide battle-group tactical flexibility and responsiveness needed to enable full wartime capability.

In the area of the TMPC, research and development is performed in order to provide scalable configurations to deploy where and as needed to provide necessary command and control, conduct development necessary to function with national and tactical imagery architectures, support new TWS capabilities, decrease mission planning time, and increase the quality and accuracy of each mission for the TWS.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4036 / *TTWCS TMPC PPPI*	

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
TMPC 7.0	SS/CPFF	Vencore : San Jose, CA	0.000	0.000		0.000		5.675	Dec 2018	-		5.675	Continuing	Continuing	Continuing
TMPC 7.0	SS/CPFF	Tapestry : St. Louis, MO	0.000	0.000		0.000		2.407	Dec 2018	-		2.407	Continuing	Continuing	Continuing
TMPC 7.0	SS/CPFF	BAE Systems : San Diego, CA	0.000	0.000		0.000		2.040	Dec 2018	-		2.040	Continuing	Continuing	Continuing
TMPC 7.0	SS/CPFF	Leidos : California, MD	0.000	0.000		0.000		5.703	Dec 2018	-		5.703	Continuing	Continuing	Continuing
TMPC 7.0	SS/CPFF	UARC APL : Laurel, MD	0.000	0.000		0.000		0.111	Nov 2018	-		0.111	Continuing	Continuing	Continuing
TMPC 7.0	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		0.000		0.614	Nov 2018	-		0.614	Continuing	Continuing	Continuing
TMPC 8.0	SS/CPFF	Vencore : San Jose, CA	0.000	0.000		0.000		0.362	Dec 2018	-		0.362	Continuing	Continuing	Continuing
TMPC 8.0	SS/CPFF	Tapestry : St. Louis, MO	0.000	0.000		0.000		0.328	Nov 2018	-		0.328	Continuing	Continuing	Continuing
TMPC 8.0	SS/CPFF	BAE Systems : San Diego, CA	0.000	0.000		0.000		0.328	Nov 2018	-		0.328	Continuing	Continuing	Continuing
TMPC 8.0	SS/CPFF	Leidos : California, MD	0.000	0.000		0.000		0.618	Nov 2018	-		0.618	Continuing	Continuing	Continuing
TMPC 8.0	SS/CPFF	UARC APL : Laurel, MD	0.000	0.000		0.000		0.084	Nov 2018	-		0.084	Continuing	Continuing	Continuing
TMPC 8.0	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		0.000		0.277	Nov 2018	-		0.277	Continuing	Continuing	Continuing
Systems Engineering - TTWCS A2AD Improvements (NAV/ COMMS)	WR	NSWC : Dahlgren, VA	0.000	0.000		0.000		1.180	Dec 2018	-		1.180	Continuing	Continuing	Continuing
Systems Engineering- TTWCS Software Support Activity(NAV/COMMS)	SS/CPFF	LMVF : Valley Forge, PA	0.000	0.000		0.000		0.785	Dec 2018	-		0.785	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		20.512		-		20.512	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204229N / *Tomahawk Mssn Planning Ctr*	Project (Number/Name) 4036 / *TTWCS TMPC PPPI*	

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

TMPC 7.0 - Implements functionality to support Maritime Strike Tomahawk. Aligns with PU 4034.

TMPC 8.0 - Implements functionality to support GPS M-Code and JMEWS. Aligns with PU 4033 and 4035.

FY 2019 funding increase supports the acceleration of the Maritime Strike TWS capability under TMPC 7.0.

FY 2019 TTWCS funding required to continue to provides launch capability for both types of modernization efforts, A2AD (Nav/Comms) and Maritime, through an incremental approach to software and hardware upgrades.

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
TMPC 6.0	SS/CPFF	Vencore : San Jose, CA	0.000	0.000		0.000		0.988	Dec 2018	-		0.988	0.000	0.988	0.988
TMPC 6.0	SS/CPFF	Leidos : California, MD	0.000	0.000		0.000		1.129	Nov 2018	-		1.129	0.000	1.129	0.910
PPPI Development Support	WR	NAWC-WD : China Lake, CA	0.000	0.000		0.000		0.760	Nov 2018	-		0.760	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		2.877		-		2.877	Continuing	Continuing	N/A

Remarks

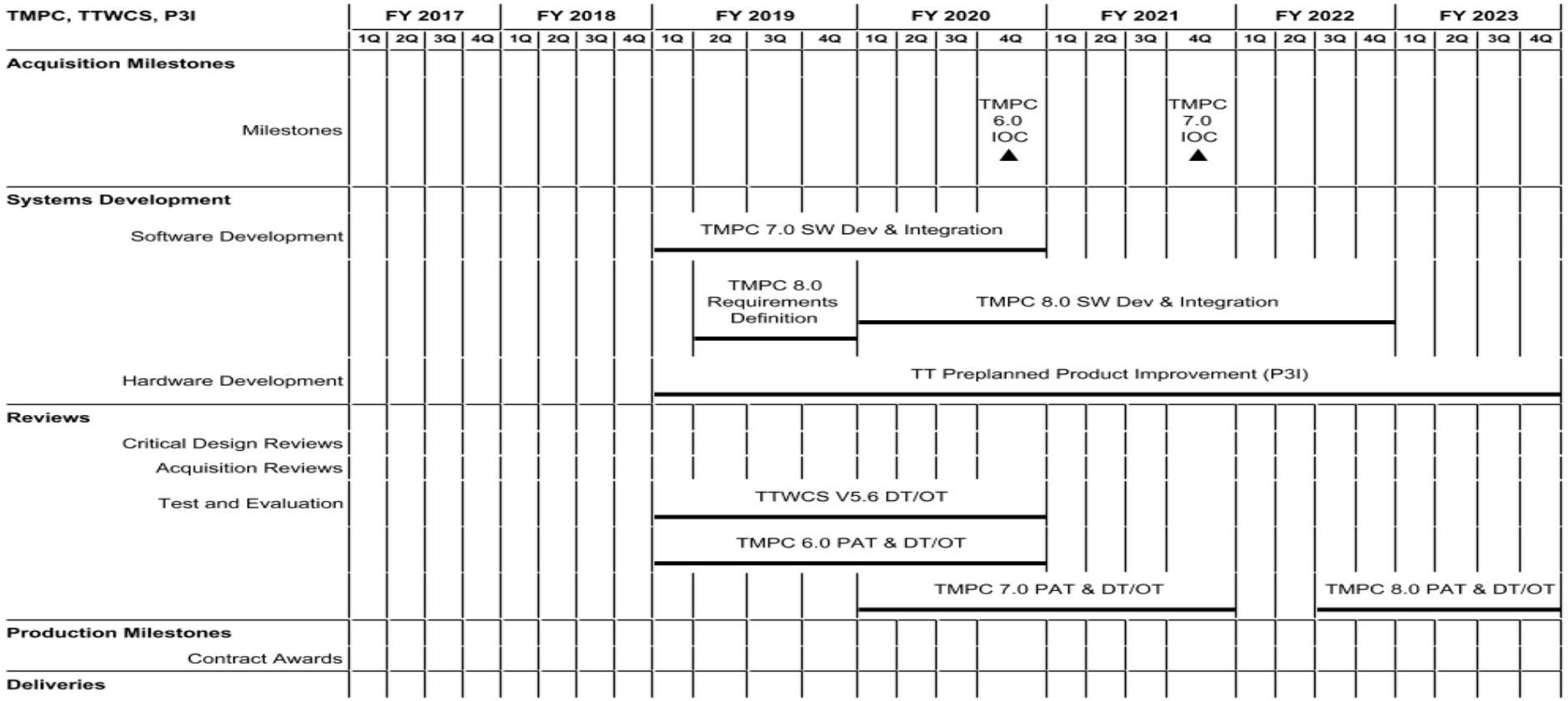
Pre-Planned Product Improvement efforts (PPPI) required to perform nonrecurring engineering activities, systems and software development, integration and testing of capability upgrades to address emergent threats, UONS, fleet gaps, and the Tomahawk ORD.

TMPC 6.0 - Missile Modernization; Timeline Improvements; Communications Upgrades, deploys to all sites, IOC 4th Qtr FY20. Aligns with PU 4032.

	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		23.389		-		23.389	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4036 / *TTWCS TMPC PPPI*



2019PB - 0204229N - 4036

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204229N / *Tomahawk Mssn Planning Ctr*	**Project (Number/Name)** 4036 / *TTWCS TMPC PPPI*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TMPC, TTWCS, P3I				
Acquisition Milestones: Milestones: TMPC 6.0 IOC	4	2020	4	2020
Acquisition Milestones: Milestones: TMPC 7.0 IOC	4	2021	4	2021
Systems Development: Software Development: TMPC 7.0 SW Dev & Integration	1	2019	4	2020
Systems Development: Software Development: TMPC 8.0 SW Dev & Integration	1	2020	4	2022
Systems Development: Software Development: TMPC 8.0 Requirements Definition	2	2019	4	2019
Systems Development: Hardware Development: TT Preplanned Product Improvement (P3I)	1	2019	4	2023
Reviews: Test and Evaluation: TTWCS V5.6 Modernized Missile DT/OT	1	2019	4	2020
Reviews: Test and Evaluation: TMPC 6.0 Product Acceptance Testing (PAT) & DT/OT	1	2019	4	2020
Reviews: Test and Evaluation: TMPC 7.0 Product Acceptance Testing (PAT) & DT/OT	1	2020	4	2021
Reviews: Test and Evaluation: TMPC 8.0 Product Acceptance Testing (PAT) & DT/OT	3	2022	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204311N *I Integrated Surveillance 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	406.030	57.043	50.572	36.959	-	36.959	59.619	81.759	84.409	84.902	Continuing	Continuing
0344: *SUB AUXILIARIES*	0.000	0.000	0.000	0.000	-	0.000	8.500	22.500	25.100	24.400	Continuing	Continuing
0766: *IUSS Detect/Classif System*	406.030	57.043	50.572	36.959	-	36.959	51.119	59.259	59.309	60.502	Continuing	Continuing

A. Mission Description and Budget Item Justification

Project 0766 provides for Integrated Undersea Surveillance Systems (IUSS) Research and Development Projects under the Maritime Surveillance Systems (MSS) Program Office (PEO SUB PMS 485). IUSS provides the Navy with its primary means of submarine detection both nuclear and diesel. A portion of project 0766 Fixed Surveillance System (FSS) is classified, with details available at a higher classification level.

The IUSS Research and Development project (0766) funds SURTASS Passive and SURTASS Low Frequency Active (LFA) developments. SURTASS provides the mobile, tactical arm of the Integrated Undersea Surveillance System, providing long range detection and cueing for tactical weapons platforms or other vessels of interest. SURTASS LFA provides an active adjunct capability for IUSS passive and tactical sensors to assist in countering the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow quiet threats in harsh littoral waters.

Development and improvement continues on the common IUSS processor based on NAVSEA's Acoustic Rapid COTS Insertion (ARCI) program with a cyclical tech refresh of hardware and software in conjunction with the submarine Advanced Processor Build (APB) process. The IUSS Integrated Common Processor (ICP) has the capability to process and display data from all fixed and mobile underwater systems. The IUSS ICP is used for all new system installations and replaces the legacy systems as they reach end of life and require upgrading. Additionally, SURTASS consolidated on the TB-29A Twin-line array, a variant of the Submarine TB-29A Long line array. This reduced the number of array variants employed by SURTASS from 3 to 1, and enabled development and logistics cost savings by leveraging off the submarine TB-29A program.

The Navy's Theater Anti-Submarine Warfare (TASW) Offset Strategy responds to an urgent EUROCOM/AFRICOM requirement for additional maritime intelligence, surveillance, and reconnaissance capabilities. PEOSUB, in conjunction with COMSUBFOR and CNO, directed a rapid prototyping program be undertaken utilizing systems developed by the Office of Naval Research (ONR), the Defense Advanced Research Projects Agency (DARPA) and the Naval Undersea Warfare Center (NUWC). Development of TASW capabilities to meet TASW requirements against evolving threats in the EUROCOM/AFRICOM Area of Responsibility (AOR) will also serve to address similar requirements globally. In FY16, funds were reprogrammed to complete the first prototype contracting and deployment in support of the Navy's TASW Offset Strategy. In FY17, the IUSS Research and Development project (0766) funded the second major prototype contracting and deployment to support the Navy's TASW Offset Strategy. This is a Military Intelligence Program (MIP).

Project 0344 funds the Deployable System of Systems project which complements FSS and SURTASS by providing flexibility to TASW commanders worldwide by allowing the Fleet to address operational gaps in wide area undersea surveillance by using a deep water deployable system.

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 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0204311N *I Integrated Surveillance System*			
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	58.542	38.972	40.135	-	40.135
Current President's Budget	57.043	50.572	36.959	-	36.959
Total Adjustments	-1.499	11.600	-3.176	-	-3.176
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	11.600	-2.803	-	-2.803
• Rate/Misc Adjustments	0.000	0.000	-0.373	-	-0.373
• Congressional General Reductions Adjustments	-0.015	-	-	-	-
• Congressional Directed Reductions Adjustments	-1.484	-	-	-	-

Change Summary Explanation

Program Adjustments: FY18 Increase of $11.600 million is to support continued funding for the TASW ERI PBR.

The FY 2019 funding request was reduced by $0.149 million to reflect the Department of the 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 2019 funding request was reduced by $9.758 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 / 7	R-1 Program Element (Number/Name) PE 0204311N / *Integrated Surveillance System*	Project (Number/Name) 0344 / *SUB AUXILIARIES*	

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
0344: *SUB AUXILIARIES*	0.000	0.000	0.000	0.000	-	0.000	8.500	22.500	25.100	24.400	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Deployable System of Systems project (0344), complementing FSS and SURTASS, provides flexibility to Theater Anti-Submarine Warfare commanders worldwide, allowing the Fleet to address operational gaps in wide area undersea surveillance by using a deep water deployable system. The Deployable Family of Systems will operate as adjunct systems to meet the established FSS and SURTASS missions. Informed by TASW offset operations, following priority needs, systems will be transitioned to development and testing in FY21-23.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204311N / *Integrated Surveillance System*	Project (Number/Name) 0766 / *IUSS Detect/Classif 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
0766: *IUSS Detect/Classif System*	406.030	57.043	50.572	36.959	-	36.959	51.119	59.259	59.309	60.502	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

A. This project includes efforts for SURTASS and the Theater ASW Offset Initiative. The SURTASS project comprises the mobile, tactical arm of the Integrated Undersea Surveillance System, providing long range detection and cueing for tactical weapons platforms against both diesel and nuclear powered submarines. SURTASS also provides the undersea surveillance necessary to support regional conflicts and sea-lane protection. SURTASS has experienced recent passive and active success against diesel submarines operating in shallow water. SURTASS is leveraging existing developments and reducing costs by using Non-Developmental Items and commercial hardware, supporting common Navy Undersea Warfare processing and towed array developments, and increasing operator efficiency through computer-aided detection and classification processing. SURTASS development efforts include LFA/CLFA improvements, common IUSS processing, twin-line array development and processing, improved detection and classification/passive automation to counter quieter threats, additional signal processing, integrated active and passive operations, improved Battle Group support, and improved information processing.

LFA provides an active adjunct capability for IUSS passive and tactical sensors to counter the quieter diesel and nuclear threats of the 1990s and beyond. The LFA tasks are directed at detection of slow, quiet threats in harsh littoral waters. Improvements include TL-29A/LFA integration enhancements, advanced waveforms for littoral/shallow water operations including Doppler sensitive waveforms, and processing algorithms to reduce clutter and reverberation false alarms in shallow water. The Integrated Common Processor (ICP) is a derivative of the NAVSEA Submarine Acoustic Rapid Commercial Off the Shelf (COTS) Insertion (ARCI) program, and is being augmented for IUSS requirements. Together, the LFA/CLFA improvements, TL-29A, and the ICP support the SURTASS Active Improvement Program.

Functional improvements to ICP are delivered to the Fleet in software "builds" while hardware improvements are delivered through the Tech Insertion (TI) process. Software improvements delivered via the Advanced Surveillance Build (ASB) process are based on the Advanced Processor Build (APB) process begun by the NAVSEA Submarine USW program. Each ASB will introduce new capabilities into SURTASS systems including improved automation, normalizer techniques, adaptive beam forming, and display enhancements. SURTASS participates in the process by contributing algorithms for consideration, supplying peer group members for review of candidate algorithms, participating in test evolutions, and incorporating improved algorithms into operational systems. The TI process, modeled after the NAVSEA Submarine USW hardware improvement program, delivers processing technology improvements to platforms on roughly a 4-6 year cycle. Hardware upgrades for active and passive arrays and communications systems will also be provided during TI upgrades, but not on a regular planned development cycle as for the processing upgrades.

B. PEO SUB is involved with the development and maintenance of various IUSS systems. These systems include Fixed Distributed systems (FDS), Fixed Distributed Systems-Commercial (FDS-C), and SURTASS. The existing system architectures, signal processing, contact management, and reporting requirements will be evaluated as well as the requirements for future systems. The cyclical development of the ICP will take advantage of automation advancement, array technology improvements, along with IUSS, submarine, and surface USW system commonality to address these requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif System*

C. Theater Anti-Submarine Warfare Strategy (TASW) Offset Initiative responds to an urgent EUROCOM/AFRICOM requirement for additional maritime intelligence, surveillance, and reconnaissance capabilities. PEOSUB, in conjunction with COMSUBFOR and CNO, directed a rapid prototyping program be undertaken utilizing systems developed by the Office of Naval Research (ONR), the Defense Advanced Research Projects Agency (DARPA) and the Naval Undersea Warfare Center (NUWC). Development of TASW capabilities to meet TASW requirements against evolving threats in the EUROCOM/AFRICOM Area of Responsibility (AOR) will also serve to address similar requirements globally.
The FSS portion of 0766 is classified with details available at a higher classification level.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Integrated Common Processor (ICP)	13.851	15.831	13.650	0.000	13.650
Articles:	-	-	-	-	-
FY 2018 Plans: Develop advanced Undersea Warfare (USW) sensor technology and associated processor and Advanced Surveillance Build (ASB) processing to enhance capabilities necessary to meet Key Performance Parameters against adversary's advanced submarines. Both processing and sensors are required to detect increasingly quiet threats in a cluttered environment with the emerging situation of insufficient numbers of qualified Fleet operators available to staff. These CNO high priority systems provide for the requirement to increase focus on operator workload reduction and processing capability enhancement/development as well as increased sensitivity of sensors. Work will include development of software updates, improvements to reduce existing and projected cyber security threat vectors, as well as, improving the overall Program Protection posture for afloat ICP installations and associated Engineering Measurements Program (EMP) systems. Continue to investigate methods to reduce surface ship clutter in order to enhance detection performance to include incorporation of Passive Sonar Automation Technology (PSAT) aspects. Continue to support Technical Insertion-18 (TI-18) hardware replacement to enhance ICP surveillance capability.					
FY 2019 Base Plans: Develop advanced Undersea Warfare (USW) sensor technology and associated processor and Advanced Surveillance Build (ASB) processing to enhance capabilities necessary to meet Key Performance Parameters against adversary's advanced submarines. Both processing and sensors are required to detect increasingly quiet threats in a cluttered environment with the emerging situation of insufficient numbers of qualified Fleet operators available to staff. These CNO high priority systems provide for the requirement to increase focus on operator workload reduction and processing capability enhancement/development as well as increased sensitivity of sensors. Work will include development of software updates, improvements to reduce existing and projected cyber security threat vectors, as well as, improving the overall Program Protection posture for afloat ICP installations and associated Engineering Measurements Program (EMP) systems. Continue to investigate					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
methods to reduce surface ship clutter in order to enhance detection performance to include incorporation of Passive Sonar Automation Technology (PSAT) aspects. Continue to support Technical Insertion-18 (TI-18) hardware replacement to enhance ICP surveillance capability. The FY 2019 funding request was reduced by $2.2 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:*** The FY 2019 funding request overall was reduced by $9.758 million to account for the availability of prior year execution balances; a $2.2M decrease between FY18 and FY19 specifically to the ICP program.					
Title: Compact Low Frequency Active (CLFA) ***Articles:*** ***FY 2018 Plans:*** Continue product improvement and upgrade efforts associated with CLFA and LFA OT&E, and development of cyber security enhancements. Conduct pier-side and at-sea test and evaluation efforts to research alternative LFA/CLFA system performance enhancements. Will conduct yearly cyber security evaluation of deployed systems. ***FY 2019 Base Plans:*** Continue product improvement and upgrade efforts associated with CLFA and LFA OT&E, and development of cyber security enhancements. Conduct pier-side and at-sea test and evaluation efforts to research alternative LFA/CLFA system performance enhancements. Will conduct yearly cyber security evaluation of deployed systems. Investigate future active systems to outfit T-AGOS X development. ***FY 2019 OCO Plans:*** N/A	2.000 -	2.000 -	2.000 -	0.000 -	2.000 -
Title: TL-29A/Twin-Line ***Articles:*** ***FY 2018 Plans:*** Continue development of true fiber optic array technologies and array components with reduced connection points. Continue efforts to explore Twin-line variants of new submarine Long-line arrays for future application to SURTASS. Continue development of fishing net mitigation approaches and supports associated test	2.000 -	2.000 -	2.000 -	0.000 -	2.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
and evaluation efforts to facilitate operations in littoral waters and reduced potential for array damage from fishing apparatus. Continue development of upgraded components to address component obsolescence. Improvements intended to modernize equipment to address system deficiencies, improve operational reliability, and reduce maintenance touch-points. ***FY 2019 Base Plans:*** Continue development of true fiber optic array technologies and array components with reduced connection points. Continue efforts to explore Twin-line variants of new submarine Long-line arrays for future application to SURTASS. Continue development of fishing net mitigation approaches and supports associated test and evaluation efforts to facilitate operations in littoral waters and reduced potential for array damage from fishing apparatus. Continue development of upgraded components to address component obsolescence. Improvements intended to modernize equipment to address system deficiencies, improve operational reliability, and reduce maintenance touch-points. ***FY 2019 OCO Plans:*** N/A					
Title: Theater Anti-Submarine Warfare (TASW)	27.596	11.600	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: OCO: Execute preliminary staging, planning and preparation for, and execution of the Q1FY19 TASW prototype operations. Complete contract actions for additional prototype units to augment existing prototype barriers. Complete deployment of additional prototype units. Recover and demilitarize TASW hardware in FY19 following completion of TASW FY19 prototype operations ***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 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif System*

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 of $11.6M from FY 2018 to FY 2019 to $0.0M in FY 2019 is due to conclusion of the TASW ERI effort in FY 2018					
Title: Classified Effort	11.596	19.141	19.309	0.000	19.309
Articles:	-	-	-	-	-
Description: The FSS portion of 0766 is classified with details available at a higher classification level. ***FY 2018 Plans:*** The FSS portion of 0766 is classified with details available at a higher classification level. ***FY 2019 Base Plans:*** The FSS portion of 0766 is classified with details available at a higher classification level. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding request was reduced by $0.168 million as the aggregate of program increases detailed at higher classification level, reductions to account for the availability of prior year execution balances, and directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.					
Accomplishments/Planned Programs Subtotals	57.043	50.572	36.959	0.000	36.959

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/2237: *SURTASS*	43.743	30.180	57.872	-	57.872	22.084	18.188	24.462	24.918	Continuing	Continuing

Remarks

D. Acquisition Strategy

FY 2010: T&E Milestones: CLFA/TL-29A/ICP DT.
FY 2011: Engineering Milestones: ICP Tech Refresh.
FY 2011: T&E Milestones: CLFA/TL-29A/ICP DT. LFA/TL-29A/ICP FOT&E.
FY 2012: T&E Milestones: CLFA/TL-29A/ICP DT/OT. LFA/TL-29A/ICP FOT&E.
FY 2013: LFA/TL-29A/ICP FOT&E.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif System*

FY 2014: ICP Tech Refresh. CLFA OT/CLFA/TL-29A/ICP FOT&E
FY 2015: ICP Tech Refresh. LFA/CLFA/TL-29A/ICP FOT&E
FY 2016: ICP Tech Refresh. ASB Step 4 Testing.
FY 2017: ICP Tech Refresh. CLFA/TL-29A/ICP FOT&E
FY 2018: ICP Tech Refresh. ASB Step 4 Testing.
FY 2018: LFA/TL-29A/ICP FOT&E
FY 2019: ICP Tech Refresh. CLFA/TL-29A/ICP FOT&E
The FSS portion of 0766 is classified with details available at a higher classification level.

E. Performance Metrics

Successfully complete CLFA Operational Test Readiness Review. Successfully complete CLFA Developmental Test / Operational Test. Successful demonstration of required LFA/CLFA improvements capability. Successful transition of Submarine Advanced Processing Build (APB) functionality and advanced capabilities into IUSS products. Successful transition of net mitigation technologies into Towed Array baseline.
The FSS portion of 0766 is classified with details available at a higher classification level.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204311N / *Integrated Surveillance System*	Project (Number/Name) 0766 / *IUSS Detect/Classif 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
IUSS COMMON ARCHITECTURE	C/CPFF	LOCKHEED MARTIN : VA	33.644	5.552	Feb 2017	6.326	Dec 2017	5.437	Dec 2018	-		5.437	Continuing	Continuing	Continuing
IUSS COMMON ARCHITECTURE	SS/CPFF	APL/JHU : MD	3.361	0.767	May 2017	1.054	Apr 2018	1.170	Apr 2019	-		1.170	Continuing	Continuing	Continuing
IUSS COMMON ARCHITECTURE	Various	VARIOUS : Not Specified	67.689	2.004	Feb 2017	2.056	Dec 2017	1.765	Dec 2018	-		1.765	Continuing	Continuing	Continuing
IUSS COMMON ARCHITECTURE	C/CPFF	ADAPTIVE Methods : VA	2.650	0.687	Feb 2017	0.774	Dec 2017	0.680	Dec 2018	-		0.680	Continuing	Continuing	Continuing
ACTIVE IMPROVEMENT/ CLFA/LFA	WR	NFESC : CA	2.170	0.363	Feb 2017	0.414	Dec 2017	0.413	Dec 2018	-		0.413	Continuing	Continuing	Continuing
ACTIVE IMPROVEMENT/ CLFA/LFA	WR	SSC PAC : CA	1.547	0.205	Jan 2017	0.199	Nov 2017	0.197	Nov 2018	-		0.197	Continuing	Continuing	Continuing
ACTIVE IMPROVEMENT/ CLFA/LFA	SS/CPFF	APL/JHU : MD	2.815	0.557	May 2017	0.512	Apr 2018	0.509	Apr 2019	-		0.509	Continuing	Continuing	Continuing
ARRAY IMPROVEMENTS	SS/CPFF	APL/JHU : VA	3.465	0.842	May 2017	0.920	Apr 2018	0.927	Apr 2019	-		0.927	Continuing	Continuing	Continuing
ARRAY IMPROVEMENTS	SS/CPFF	ADAPTIVE METHODS : VA	1.247	0.503	Feb 2017	0.339	Dec 2017	0.321	Dec 2018	-		0.321	Continuing	Continuing	Continuing
ARRAY IMPROVEMENTS	Various	VARIOUS : Not Specified	9.760	0.355	Feb 2017	0.441	Jan 2018	0.448	Jan 2019	-		0.448	Continuing	Continuing	Continuing
TASW FIELDING	Various	SSC PAC : CA	3.084	0.848	Mar 2017	0.200	Dec 2017	0.000		-		0.000	0.000	4.132	-
TASW FIELDING	Various	NUWC NEWPORT : RI	1.153	1.390	Jul 2017	0.300	Nov 2017	0.000		-		0.000	0.000	2.843	-
TASW FIELDING	SS/CPFF	APL/UW : WA	12.075	0.999	Jul 2017	0.900	Feb 2018	0.000		-		0.000	0.000	13.974	-
TASW FIELDING	Various	VARIOUS : CA	1.883	0.401	Jul 2017	0.000		0.000		-		0.000	0.000	2.284	-
TASW FIELDING	C/CPFF	LEIDOS : CA	34.858	19.552	Feb 2017	5.500	Dec 2017	0.000		-		0.000	0.000	59.910	-
TASW FIELDING	C/CPFF	PROTEQ : VA	1.180	1.650	Sep 2017	1.000	Mar 2018	0.000		-		0.000	0.000	3.830	-
TASW FIELDING	SS/CPFF	SANDIA : NM	0.000	0.621	May 2017	0.000		0.000		-		0.000	0.000	0.621	-
TASW FIELDING	WR	NAVY OCEANOGRAPHIC OFFICE : MS	0.000	0.000		0.200	Feb 2018	0.000		-		0.000	0.000	0.200	-
FSS - Classified	Various	TBD : Not Specified	138.084	11.596	Nov 2016	19.141	Nov 2017	19.309	Nov 2018	-		19.309	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif 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
		Subtotal	320.665	48.892		40.276		31.176		-		31.176	Continuing	Continuing	N/A

Remarks

The FSS portion of 0766 is classified with details available at a higher classification level.

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
IUSS COMMON ARCHITECTURE	WR	SSC PAC : CA	4.242	0.381	Apr 2017	0.412	Nov 2017	0.362	Nov 2018	-		0.362	Continuing	Continuing	Continuing
IUSS COMMON ARCHITECTURE	C/CPFF	APL/JHU : MD	2.111	1.031	May 2017	1.537	Apr 2018	1.007	Apr 2019	-		1.007	Continuing	Continuing	Continuing
IUSS COMMON ARCHITECTURE	C/CPFF	Lockheed Martin : VA	3.252	0.906	Feb 2017	1.012	Dec 2017	0.889	Dec 2018	-		0.889	Continuing	Continuing	Continuing
IUSS COMMON ARCHITECTURE	Various	VARIOUS : Not Specified	4.906	0.397	Mar 2017	0.414	Jan 2018	0.364	Jan 2019	-		0.364	Continuing	Continuing	Continuing
ACTIVE IMPROVEMENT/ CLFA/LFA	WR	SSC PAC : CA	0.928	0.195	Jan 2017	0.195	Nov 2017	0.195	Nov 2018	-		0.195	Continuing	Continuing	Continuing
ACTIVE IMPROVEMENT/ CLFA/LFA	Various	VARIOUS : Not Specified	7.630	0.141	Mar 2017	0.141	Jan 2018	0.141	Jan 2019	-		0.141	Continuing	Continuing	Continuing
ARRAY IMPROVEMENTS	Various	VARIOUS : Not Specified	1.552	0.200	Mar 2017	0.195	Jan 2018	0.197	Jan 2019	-		0.197	Continuing	Continuing	Continuing
TASW FIELDING	WR	NUWC NEWPORT : MA	0.180	0.250	Jul 2017	0.700	Nov 2017	0.000		-		0.000	0.000	1.130	-
TASW FIELDING	WR	NUWC KEYPORT : WA	0.400	0.125	Jul 2017	0.120	Nov 2017	0.000		-		0.000	0.000	0.645	-
TASW FIELDING	SS/CPFF	APL/JHU : MD	0.350	0.750	Feb 2017	0.200	Jan 2018	0.000		-		0.000	0.000	1.300	-
TASW FIELDING	WR	SSC PAC : CA	0.000	0.700	Mar 2017	0.750	Nov 2017	0.000		-		0.000	0.000	1.450	-
		Subtotal	25.551	5.076		5.676		3.155		-		3.155	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif 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
IUSS COMMON ARCHITECTURE	C/CPFF	LOCKHEED MARTIN : VA	4.341	0.846	Feb 2017	0.846	Dec 2017	0.745	Dec 2018	-		0.745	Continuing	Continuing	Continuing
IUSS COMMON ARCHITECTURE	Various	VARIOUS : Not Specified	8.206	0.550	May 2017	0.550	Jan 2018	0.487	Jan 2019	-		0.487	Continuing	Continuing	Continuing
ACTIVE IMPROVEMENT/ CLFA/LFA	WR	OPTEVFOR : VA	0.552	0.095	Feb 2017	0.095	Dec 2017	0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
ACTIVE IMPROVEMENT/ CLFA/LFA	Various	VARIOUS : Not Specified	20.919	0.084	Mar 2017	0.084	Jan 2018	0.084	Jan 2019	-		0.084	Continuing	Continuing	Continuing
ARRAY IMPROVEMENTS	SS/CPFF	APL/JHU : MD	0.890	0.235	May 2017	0.235	Apr 2018	0.235	Apr 2019	-		0.235	Continuing	Continuing	Continuing
TASW FIELDING	WR	NUWC NEWPORT : MA	0.149	0.250	Jul 2017	0.300	Feb 2018	0.000		-		0.000	0.000	0.699	-
TASW FIELDING	WR	NAVY OCEANOGRAPHIC OFFICE : MS	0.854	0.060	Jul 2017	0.030	Feb 2018	0.000		-		0.000	0.000	0.944	-
		Subtotal	35.911	2.120		2.140		1.651		-		1.651	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
IUSS COMMON ARCHITECTURE	Various	VARIOUS : Not Specified	7.110	0.730	Jun 2017	0.850	Jan 2018	0.745	Jan 2019	-		0.745	Continuing	Continuing	Continuing
ACTIVE IMPROVEMENT/ CLFA/LFA	Various	VARIOUS : Not Specified	15.850	0.125	Jun 2017	0.125	Jan 2018	0.125	Jan 2019	-		0.125	Continuing	Continuing	Continuing
ARRAY IMPROVEMENTS	Various	VARIOUS : Not Specified	0.558	0.100	Jun 2017	0.105	Jan 2018	0.107	Jan 2019	-		0.107	Continuing	Continuing	Continuing
TASW FIELDING	C/CPFF	BAH : VA	0.385	0.000		1.400	Jan 2018	0.000		-		0.000	0.000	1.785	-
		Subtotal	23.903	0.955		2.480		0.977		-		0.977	Continuing	Continuing	N/A

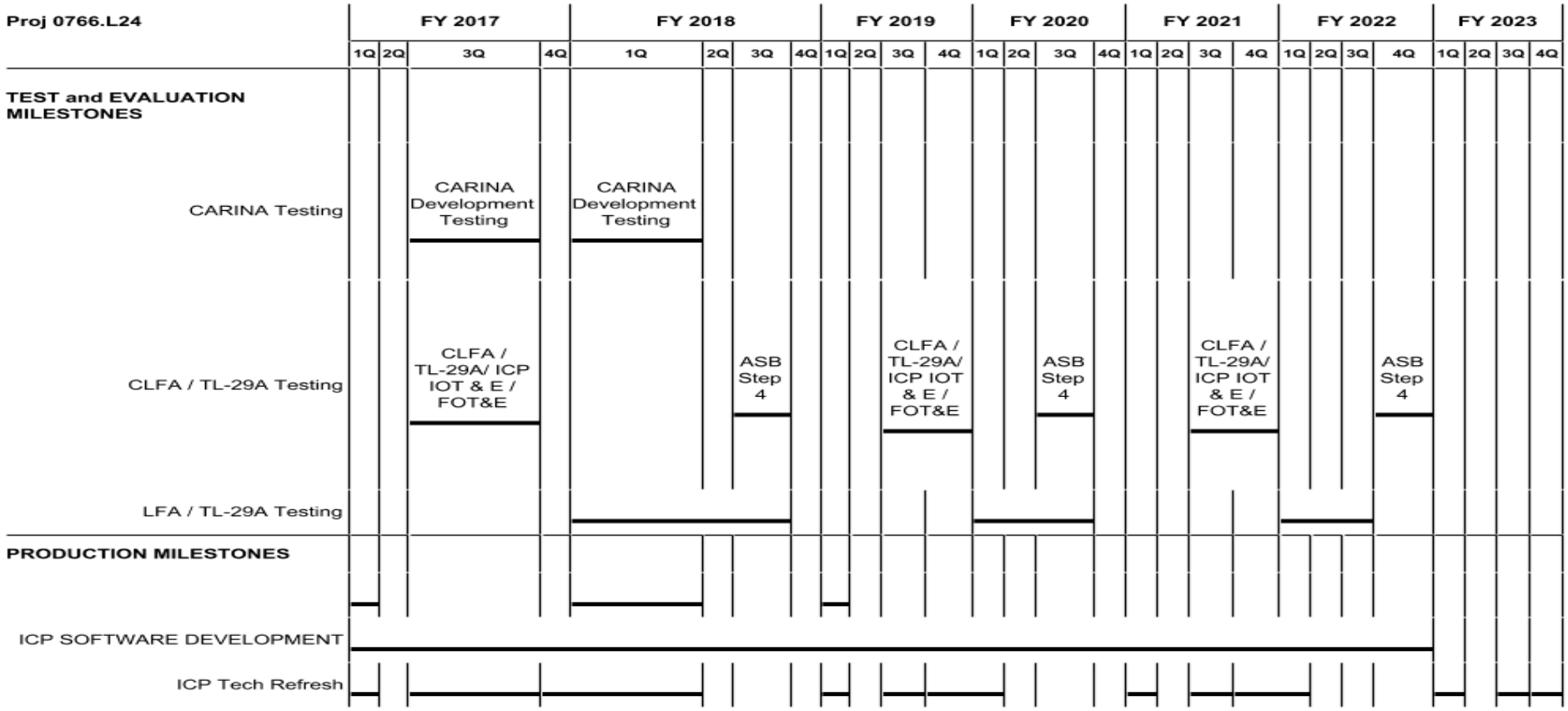
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204311N / *Integrated Surveillance System*	Project (Number/Name) 0766 / *IUSS Detect/Classif System*	

	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	406.030	57.043		50.572		36.959		-		36.959	Continuing	Continuing	N/A

Remarks

The R3 and the R4 / R4A reflect the UNCLASSIFIED portion of the PE.
The FSS portion of 0766 is classified with details available at a higher classification level.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif System*



2019DON - 0204311N - 0766.L24

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0766.L24				
TEST and EVALUATION MILESTONES: CARINA Testing: CARINA Development Testing	3	2017	3	2017
TEST and EVALUATION MILESTONES: CARINA Testing: CARINA Development Testing (2nd Test)	1	2018	1	2018
TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: CLFA / TL-29A/ ICP IOT & E / FOT&E (COMPL 2017)	3	2017	3	2017
TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: ASB Step 4 (3rd qtr FY18)	3	2018	3	2018
TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: CLFA / TL-29A/ ICP IOT & E / FOT&E (COMPL 2019)	3	2019	4	2019
TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: ASB Step 4	3	2020	3	2020
TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: CLFA / TL-29A/ ICP IOT & E / FOT&E (COMPL 2021)	3	2021	4	2021
TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: ASB Step 4	4	2022	4	2022
TEST and EVALUATION MILESTONES: CLFA / TL-29A Testing: CLFA / TL-29A/ ICP IOT & E / FOT&E (COMPL 2023)	3	2023	4	2023
TEST and EVALUATION MILESTONES: LFA / TL-29A Testing: LFA / TL-29A/ ICP FOT & E (COMPLETE 2018)	1	2018	3	2018
TEST and EVALUATION MILESTONES: LFA / TL-29A Testing: LFA / TL-29A/ ICP FOT & E (COMPLETE 2020)	1	2020	3	2020
TEST and EVALUATION MILESTONES: LFA / TL-29A Testing: LFA /TL-29A/ICP FOT & E (COMPLETE 2022)	1	2022	3	2022
PRODUCTION MILESTONES: Field First Segment TRAPS/Carina	1	2017	1	2017
PRODUCTION MILESTONES: Field Second Segment TRAPS	1	2018	1	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204311N / *Integrated Surveillance System*	**Project (Number/Name)** 0766 / *IUSS Detect/Classif System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
PRODUCTION MILESTONES: Field Third Segment TRAPS/CARINA	1	2019	1	2019
PRODUCTION MILESTONES: ICP SOFTWARE DEVELOPMENT: ICP Software Development	1	2017	4	2022
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 1st QTR FY17	1	2017	1	2017
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 3rd QTR FY17	3	2017	3	2017
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 4th QTR FY17	4	2017	1	2018
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 1st QTR FY19	1	2019	1	2019
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 3rd QTR FY19	3	2019	3	2019
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 4th QTR FY19	4	2019	1	2020
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 1st QTR FY21	1	2021	1	2021
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 3rd QTR FY21	3	2021	3	2021
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 4th QTR FY21	4	2021	1	2022
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 1st QTR FY23	1	2023	1	2023
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 3rd QTR FY23	3	2023	3	2023
PRODUCTION MILESTONES: ICP Tech Refresh: ICP Tech Refresh 4th QTR FY23	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204313N *I SHIP-TOWED ARRAY SURVEILLANCE 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	0.000	0.000	0.000	15.454	-	15.454	14.449	10.748	6.079	0.000	0.000	46.730
3261: *TAGOS Design & Total Ship Integration*	0.000	0.000	0.000	15.454	-	15.454	14.449	10.748	6.079	0.000	0.000	46.730

A. Mission Description and Budget Item Justification

This program was previously funded in FY 2018 under Program Element 0603564N (Ship Preliminary Design and Feasibility Studies) Project 3261 (TAGOS Design and Total Ship Integration). This program element continues efforts started under the previous program element and is not a new start.

T-AGOS Design & Total Ship Integration - Ocean surveillance ships gather underwater acoustical data to support the mission of the Integrated Undersea Surveillance System by
providing a ship platform capable of theater anti-submarine acoustic passive and active surveillance. Auxiliary General Ocean Surveillance Ships (T-AGOS) are operated by Military
Sealift Command to support the anti-submarine warfare mission of the commanders of the Atlantic and Pacific Fleets. The two current classes of surveillance ships use surveillance
towed-array sensor system (SURTASS) equipment to gather undersea acoustic data. The ships also carry electronic equipment to process and transmit that data via satellite to shore
stations for evaluation. Funding will support recapitalization of the four SWATH (T-19 Class) and one SWATH (T-23 Class) Auxiliary General Ocean Surveillance ships (T-AGOS).

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	15.454	-	15.454
Total Adjustments	0.000	0.000	15.454	-	15.454
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	15.454	-	15.454

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204313N *I SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS*

Change Summary Explanation

FY 2019 continues funding efforts previously financed under Program Element 0603564N (Ship Preliminary Design and Feasibility Studies) Project 3261 (TAGOS Design and Total Ship Integration).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204313N / *SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS*	Project (Number/Name) 3261 / *TAGOS Design & 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
3261: *TAGOS Design & Total Ship Integration*	0.000	0.000	0.000	15.454	-	15.454	14.449	10.748	6.079	0.000	0.000	46.730
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

T-AGOS Design & Total Ship Integration - Ocean surveillance ships gather underwater acoustical data to support the mission of the Integrated Undersea Surveillance System by
providing a ship platform capable of theater anti-submarine acoustic passive and active surveillance. Auxiliary General Ocean Surveillance Ships (T-AGOS) are operated by Military
Sealift Command to support the anti-submarine warfare mission of the commanders of the Atlantic and Pacific Fleets. The two current classes of surveillance ships use surveillance
towed-array sensor system (SURTASS) equipment to gather undersea acoustic data. The ships also carry electronic equipment to process and transmit that data via satellite to shore
stations for evaluation. Funding will support recapitalization of the four SWATH (T-19 Class) and one SWATH (T-23 Class) Auxiliary General Ocean Surveillance ships (T-AGOS).

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-AGOS Design	0.000	0.000	15.454	0.000	15.454
Articles:	-	-	-	-	-

FY 2018 Plans:
Funding for FY18 is in PE 0603564N (Ship Preliminary Design and Feasibility Studies) Project 3261 (TAGOS Design and Total Ship Integration). FY18 funding amount is 12.012 million.

FY 2019 Base Plans:
Award multiple contracts for industry studies. Begin the Navy led Preliminary Design efforts with industry participation. Continue development of SURTASS interface documentation. Conduct Gate 3 to support submission of the CDD for joint staffing. Develop model to conduct seakeeping and loads tests. Coordinate acquisition efforts with NAVSEA, MSC, PEO SHIPS, CNO, ASN RD&A, OSD, and Fleet.

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 / 7	**R-1 Program Element (Number/Name)** PE 0204313N / *SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS*	**Project (Number/Name)** 3261 / *TAGOS Design & 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
Funding increase from FY18 ($12.012 million) is to begin the design efforts with industry and model development for testing.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	15.454	0.000	15.454

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/5030: *TAGOS Surtass Ships*	0.000	0.000	0.000	-	0.000	0.000	0.000	343.244	369.000	901.000	1,613.244

Remarks

D. Acquisition Strategy

Develop CDD, conduct trade studies and Pre-Preliminary Design in FY18. Issue RFP for Industry Studies for award of multiple contracts in FY19 to participate in Navy-led Preliminary/Contract Design (PD/CD) efforts. Complete Navy-led PD/CD efforts in FY21in order to issue Detail Design and Construction (DD&C) RFP and award to a single shipbuilder in FY22 for DD&C of a Lead Ship with options for up to four follow-on ships.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204313N / *SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS*	**Project (Number/Name)** 3261 / *TAGOS Design & 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
Engineering Integration/ Design	Various	Various : Various	0.000	0.000		0.000		4.338	Jan 2019	-		4.338	12.724	17.062	-
Industry Studies (shipyards)	C/FFP	Various : Various	0.000	0.000		0.000		4.000	May 2019	-		4.000	3.000	7.000	-
Model Testing	Various	Various : Various	0.000	0.000		0.000		2.124	Jan 2019	-		2.124	1.000	3.124	-
SURTASS Integration	Various	Various : Various	0.000	0.000		0.000		0.800	Jan 2019	-		0.800	2.800	3.600	-
		Subtotal	0.000	0.000		0.000		11.262		-		11.262	19.524	30.786	N/A

Remarks

FY18 funding is in PE 0603564N P/U 3261.

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
Milestone Doc/RFP Development	Various	Various : Various	0.000	0.000		0.000		1.240	Jan 2019	-		1.240	3.838	5.078	-
Specification & TDP Development	Various	Various : Various	0.000	0.000		0.000		1.446	Jan 2019	-		1.446	3.160	4.606	-
Systems Integration (C4I/ Safety/Risk)	Various	Various : Various	0.000	0.000		0.000		0.930	Jan 2019	-		0.930	2.804	3.734	-
Source Selection Support	Various	Various : Various	0.000	0.000		0.000		0.163	Feb 2019	-		0.163	0.300	0.463	-
		Subtotal	0.000	0.000		0.000		3.779		-		3.779	10.102	13.881	N/A

Remarks

FY18 funding is in PE 0603564N P/U 3261.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204313N / *SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS*	Project (Number/Name) 3261 / *TAGOS Design & 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
Test and Evaluation Planning	Various	Various : Various	0.000	0.000		0.000		0.413	Jan 2019	-		0.413	1.650	2.063	-
		Subtotal	0.000	0.000		0.000		0.413		-		0.413	1.650	2.063	N/A

Remarks

FY18 funding is in PE 0603564N P/U 3261.

	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		15.454		-		15.454	31.276	46.730	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204313N / *SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS*	**Project (Number/Name)** 3261 / *TAGOS Design & Total Ship Integration*

T-AGOS Design & Total Ship Integration

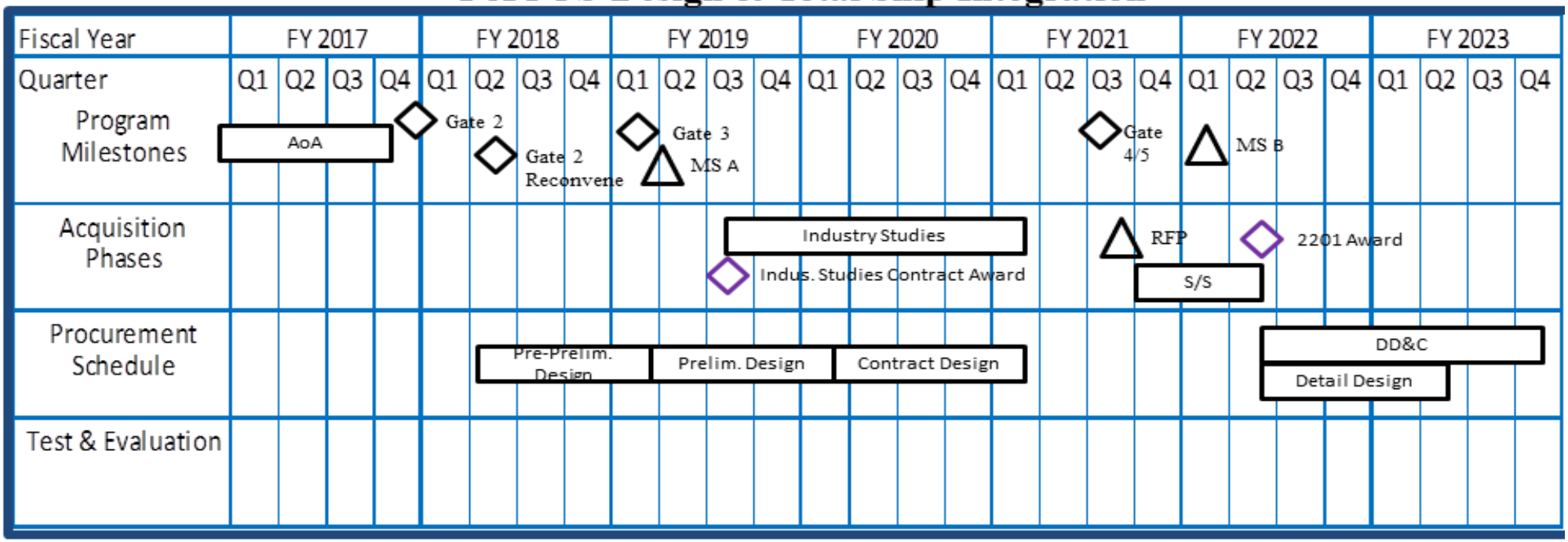


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204313N / *SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS*	**Project (Number/Name)** 3261 / *TAGOS Design & Total Ship Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3261				
Gate 3	1	2019	1	2019
Milestone B	1	2022	1	2022
DD&C Award	2	2022	2	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204413N *I Amphibious Tactical Supt Units*							
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	46.414	11.143	3.940	6.073	-	6.073	7.100	3.074	2.306	1.308	Continuing	Continuing
2231: *LCAC / LCU 1700*	45.832	9.036	1.650	1.153	-	1.153	1.229	1.270	1.297	1.308	Continuing	Continuing
2909: *Amphibious Lighterage Development*	0.582	2.107	2.290	4.920	-	4.920	5.871	1.804	1.009	0.000	0.000	18.583

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $0.020 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.

Landing Craft, Air Cushion (LCAC): Research and development efforts to transfer technologies into functional uses on the current LCACs. Current technology initiatives include sustainability/reliability/readiness/performance analyses, LCAC communication improvements, compliance with Cybersecurity policy regulations, and LCAC Total Ownership Costs (TOC) reduction initiatives.

Landing Craft, Utility (LCU 1700): Replacement program for the current LCU 1610 class craft - a class of craft that has exceeded its 25-year planned service life by nearly double, average age of craft is approaching 50-years-old. LCU 1700 will provide similar payload, range, speed, and interoperability. Contract award is planned for early 2018.

The Amphibious Support Craft Vehicle (ASCV) which will be the Lighter Amphibious Resupply Cargo, 5 ton (LARC-V) Replacement, provides amphibious equipment and personnel transport as well as near shore salvage and diving capability.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	13.929	3.940	1.898	-	1.898
Current President's Budget	11.143	3.940	6.073	-	6.073
Total Adjustments	-2.786	0.000	4.175	-	4.175
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.786	0.000			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	4.276	-	4.276
• Rate/Misc Adjustments	0.000	0.000	-0.101	-	-0.101

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204413N *I Amphibious Tactical Supt Units*

Change Summary Explanation

Added additional funding in FY 2019 to support the Amphibious Support Craft Vehicle.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204413N / *Amphibious Tactical Supt Units*	Project (Number/Name) 2231 / *LCAC / LCU 1700*	

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
2231: *LCAC / LCU 1700*	45.832	9.036	1.650	1.153	-	1.153	1.229	1.270	1.297	1.308	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Landing Craft, Air Cushion (LCAC): Research and development efforts to transfer technologies into functional uses on the current LCACs. Current technology initiatives include sustainability/reliability/readiness/performance analyses, LCAC communication improvements, compliance with Cybersecurity policy regulations, and LCAC Total Ownership Costs (TOC) reduction initiatives.

Landing Craft, Utility (LCU 1700): Replacement program for the current LCU 1610 class craft - a class of craft that has exceeded its 25-year planned service life by nearly double, average age of craft is approaching 50-years-old. LCU 1700 will provide similar payload, range, speed, and interoperability. Contract award is planned for early 2018.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: LCAC RDT&E,N and LCU 1700	9.036	1.650	1.153	0.000	1.153
Articles:	-	-	-	-	-
FY 2018 Plans: LCAC: - Improve reliability and maintainability of the LCAC HM&E systems. - Complete the technical data package for Windows 10 updates to SBC4 (command and control system) and LCAC Mission Support Systems (LMSS) stations in accordance with DoD directives and Cybersecurity requirements. - Seek Platform IT RMF accreditation. - Complete the technical data package for electronic navigation on LCAC; in accordance with OPNAVINST 9420.2A. LCU: - Conduct risk reduction efforts and special studies/analyses, which support Life Cycle/Total Ownership Cost (TOC) reductions for the class. - Perform Developmental Testing (DT-1 and DT-2) in coordination with COMOPTEVFOR and MCOTEA. - Commence Platform IT RMF accreditation activity.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204413N / *Amphibious Tactical Supt Units*	**Project (Number/Name)** 2231 / *LCAC / LCU 1700*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Update Life Cycle Sustainment Plan. ***FY 2019 Base Plans:*** LCAC: - Improve reliability and maintainability of the LCAC HM&E systems. - Maintain compliance with cybersecurity directives and mandates. LCU: - Conduct risk reduction efforts and special studies/analyses, which support Life Cycle/Total Ownership Cost (TOC) reductions for the class. - Perform Developmental Testing (DT-3 and DT-4) in coordination with COMOPTEVFOR and MCOTEA. - Complete Platform IT RMF accreditation. - Update Life Cycle Sustainment Plan. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** LCU 1700 program is entering the Design and Production phase with contract award planned early 2018.					
Accomplishments/Planned Programs Subtotals	9.036	1.650	1.153	0.000	1.153

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 0970: *LCAC*	3.090	5.507	3.709	-	3.709	5.512	5.456	20.795	21.205	0.000	180.703
• SCN 5139: *LCAC SLEP*	82.074	0.000	23.321	-	23.321	0.000	0.000	0.000	0.000	0.000	1,443.818
• SCN 5100: *LCU 1700*	0.000	31.850	41.520	-	41.520	85.733	89.559	88.737	89.579	287.782	748.760

Remarks

D. Acquisition Strategy

Technology Transition - RDT&E efforts commenced in FY06. Multiple contracts and Field Activities are involved to complete the various projects.

E. Performance Metrics

LCAC: Continue to improve the reliability, maintainability, and security of the LCAC.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204413N / *Amphibious Tactical Supt Units*	**Project (Number/Name)** 2231 / *LCAC / LCU 1700*

LCU 1700: Continue risk reduction efforts, complete MS B/C program documentation and commence updates as design completes and continue IT/OT activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204413N / *Amphibious Tactical Supt Units*	Project (Number/Name) 2231 / *LCAC / LCU 1700*	

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 CD : Philadelphia, PA	8.325	0.000		0.000		0.000		-		0.000	0.000	8.325	-
Systems Engineering	WR	NSWC : Various	6.558	0.676	Feb 2017	0.205	Jan 2018	0.199	Jan 2019	-		0.199	3.296	10.934	-
LCU 1700 - Special Studies	Various	Various : Various	14.536	3.321	May 2017	0.000		0.000		-		0.000	7.087	24.944	-
LCU 1700 - Ship Design	WR	NSWC : Various	0.000	3.482	May 2017	0.863	Jan 2018	0.310	Jan 2019	-		0.310	0.000	4.655	-
		Subtotal	29.419	7.479		1.068		0.509		-		0.509	10.383	48.858	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	WR	NSWC PCD : Panama City, FL	10.633	1.507	Mar 2017	0.199	Jan 2018	0.000		-		0.000	3.195	15.534	-
LCU 1700 - Research Studies	Various	Various : Various	0.565	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	11.198	1.507		0.199		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
Developmental Test & Evaluation	WR	Various : Various	0.287	0.000		0.076	Jan 2018	0.358	Jan 2019	-		0.358	0.000	0.721	-
Operational Test & Evaluation	WR	OPTEVFOR/ MCOTEA : Norfolk, VA/Quantico, VA	2.047	0.009	Mar 2017	0.257	Jan 2018	0.240	Jan 2019	-		0.240	0.565	3.118	-
Test Assets	WR	NSWC PCD : Panama City, FL	0.850	0.000		0.000		0.000		-		0.000	0.000	0.850	-
		Subtotal	3.184	0.009		0.333		0.598		-		0.598	0.565	4.689	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204413N / *Amphibious Tactical Supt Units*	Project (Number/Name) 2231 / *LCAC / LCU 1700*	

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	WR	Various : Various	0.726	0.000		0.000		0.000		-		0.000	0.000	0.726	-
Program Management	WR	NSWC CD : West Bethesda, MD	1.230	0.041	Apr 2017	0.050	Jan 2018	0.046	Jan 2019	-		0.046	0.165	1.532	-
Travel	WR	NAVSEA : Not Specified	0.064	0.000		0.000		0.000		-		0.000	0.000	0.064	-
Defense Acquisition Workforce	MIPR	OSD : Not Specified	0.011	0.000		0.000		0.000		-		0.000	0.000	0.011	-
		Subtotal	2.031	0.041		0.050		0.046		-		0.046	0.165	2.333	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	45.832	9.036		1.650		1.153		-		1.153	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204413N / *Amphibious Tactical Supt Units*	**Project (Number/Name)** 2231 / *LCAC / LCU 1700*

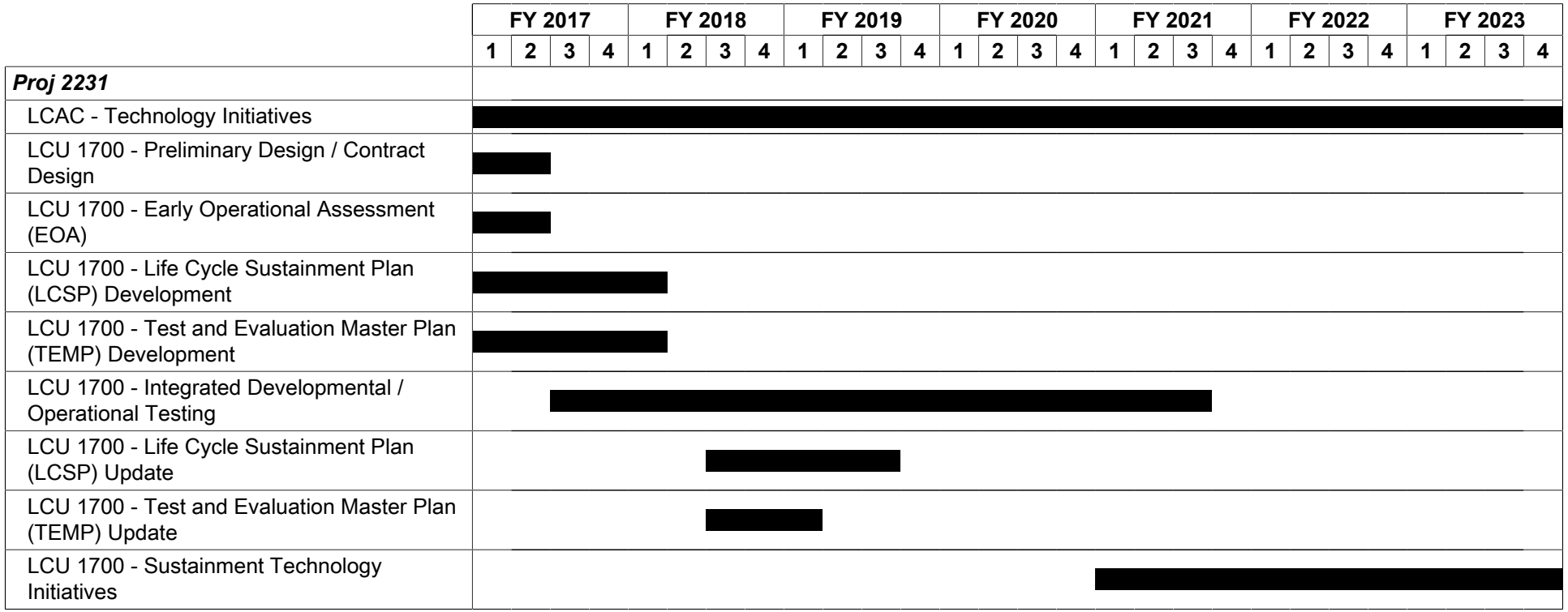


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204413N / *Amphibious Tactical Supt Units*	**Project (Number/Name)** 2231 / *LCAC / LCU 1700*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2231				
LCAC - Technology Initiatives	1	2017	4	2023
LCU 1700 - Preliminary Design / Contract Design	1	2017	2	2017
LCU 1700 - Early Operational Assessment (EOA)	1	2017	2	2017
LCU 1700 - Life Cycle Sustainment Plan (LCSP) Development	1	2017	1	2018
LCU 1700 - Test and Evaluation Master Plan (TEMP) Development	1	2017	1	2018
LCU 1700 - Integrated Developmental / Operational Testing	3	2017	3	2021
LCU 1700 - Life Cycle Sustainment Plan (LCSP) Update	3	2018	3	2019
LCU 1700 - Test and Evaluation Master Plan (TEMP) Update	3	2018	1	2019
LCU 1700 - Sustainment Technology Initiatives	1	2021	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204413N / *Amphibious Tactical Supt Units*	Project (Number/Name) 2909 / *Amphibious Lighterage 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
2909: *Amphibious Lighterage Development*	0.582	2.107	2.290	4.920	-	4.920	5.871	1.804	1.009	0.000	0.000	18.583
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Amphibious Support Craft Vehicle (ASCV) which will be the Lighter Amphibious Resupply Cargo, 5 ton (LARC-V) Replacement, provides amphibious equipment and personnel transport as well as near shore salvage and diving capability. It is a vital piece of equipment required for the execution of the Naval Beach Group (NBG) and Underwater Construction Team (UCT) 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: LARC-V Replacement	2.107	2.290	4.920	0.000	4.920
Articles:	-	-	-	-	-

FY 2018 Plans:

The ASCV program schedule and associated funding was re-baselined with the Resource Sponsor in Q3FY17. Subsequent to the approved re-baseline and realignment of funds, and in consideration of the program funding gap in FY 2016, a new series of program goals was established for ASCV. In FY2018, ASCV will continue development and execution of a tailored acquisition plan to conform with all required tasks and documents for an ACAT IV (T) program, in support of a Milestone A and Gate 2/3 review with the Milestone Decision Authority. Inclusive as part of the Milestone and Gate Review process, system Key Performance Parameters (KPPs), the Acquisition Strategy, Systems Engineering Plan, Test and Evaluation Master Plan, Capability Development Document, and System Design Request for Proposal will all be developed and approved by the MDA and Resource Sponsor (as required). The System Design RFP will be released in Q3FY18, with a subsequent award of these contracts in Q2 FY 2019.

FY 2019 Base Plans:

FY 2019 RDTE will fund the ASCV acquisition team tasks to include post-Milestone A activities, and refinement of all program documentation required by statute and regulation such as the Acquisition Plan/Acquisition Strategy, Systems Engineering Plan, Test and Evaluation Master Plan, and development of the mission-based test design. These required documents and tasks are the framework by which the eventual prototype vehicle will be evaluated for meeting Key Performance Parameters (KPPs). The development of the prototype vehicle RFP

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204413N / *Amphibious Tactical Supt Units*	**Project (Number/Name)** 2909 / *Amphibious Lighterage Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
will be initiated during FY 2019. Additionally, it is anticipated that three separate system design contracts will be awarded as part of a down-select process. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase due to technical adjustments for the ASCV program executing much of Milestone A and Gate 2/3 work in addition to developing a system design RFP.					
Accomplishments/Planned Programs Subtotals	2.107	2.290	4.920	0.000	4.920

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

RDT&E funding is required to develop a replacement amphibious vehicle to support OPLAN and Required Operational Capability/Potential Operating Environment (ROC/POE) requirements of the Naval Beach Groups and Underwater Construction Teams. Technology investigation began in FY15. Requirements documentation and analysis of alternatives and other such efforts are largely being accomplished with in house resources. Design and initial production efforts will be accomplished via a competitive award contract.

E. Performance Metrics

Quarterly Program Reviews are conducted with the performer to include funds status discussion, schedule review.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204413N / *Amphibious Tactical Supt Units*	**Project (Number/Name)** 2909 / *Amphibious Lighterage 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
LARC-V Replacement	WR	Naval Surface Warfare Center Carderock Division (N : West Bethesda, MD	0.582	2.107	Jan 2017	2.290	Mar 2018	1.920	Mar 2019	-		1.920	0.000	6.899	0.200
LARC-V Replacement	Various	EXWC : Port Hueneme, CA	0.000	0.000		0.000		3.000	Mar 2019	-		3.000	0.000	3.000	-
		Subtotal	0.582	2.107		2.290		4.920		-		4.920	0.000	9.899	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	0.582	2.107		2.290		4.920		-		4.920	0.000	9.899	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204413N / *Amphibious Tactical Supt Units*	**Project (Number/Name)** 2909 / *Amphibious Lighterage Development*

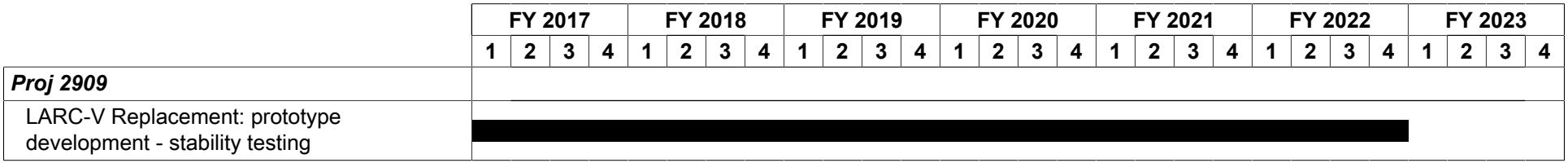


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204413N / *Amphibious Tactical Supt Units*	**Project (Number/Name)** 2909 / *Amphibious Lighterage Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2909				
LARC-V Replacement: prototype development - stability testing	1	2017	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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204460M *I (U)Ground/Air Task Oriented Radar (G/ATOR)*

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	298.419	78.860	54.645	45.029	-	45.029	23.927	10.555	12.185	12.336	Continuing	Continuing
9C89: *Marine Ground-Air Radar*	298.419	78.860	54.645	45.029	-	45.029	23.927	10.555	12.185	12.336	Continuing	Continuing

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 386

A. Mission Description and Budget Item Justification

The Ground/Air Task Oriented Radar (G/ATOR) is a 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 (G/ATOR Block 1) and the Ground Counter Fire/Counter Battery (G/ATOR Block 2) 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 UAS, 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.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	83.538	54.645	16.406	-	16.406
Current President's Budget	78.860	54.645	45.029	-	45.029
Total Adjustments	-4.678	0.000	28.623	-	28.623
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.149	0.000			
• Program Adjustments	0.000	0.000	29.000	-	29.000
• Rate/Misc Adjustments	0.000	0.000	-0.377	-	-0.377
• Congressional General Reductions Adjustments	-0.029	-	-	-	-
• 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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204460M *I (U)Ground/Air Task Oriented Radar (G/ATOR)*

Change Summary Explanation

RDT&E funding decreases $9.616M throughout the total G/ATOR program from FY18 to FY19 with the completion of DT1C/OA, DT1D/OA and initiation of DT1E in FY18. Program Management support completely migrates from RDT&E to PMC funding as G/ATOR begins Full Rate Production in FY19.

RDT&E funding increase in FY19 from PB18 to PB19 supports software development supporting a Composite Tracking Network (CTN) interface for the GB2 mission profile that will reduce Warfighter Air Surveillance gaps and improvements to the radar emplacement/displacement time.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	Project (Number/Name) 9C89 / *Marine Ground-Air 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
9C89: *Marine Ground-Air Radar*	298.419	78.860	54.645	45.029	-	45.029	23.927	10.555	12.185	12.336	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 386

A. Mission Description and Budget Item Justification

The Ground/Air Task Oriented Radar (G/ATOR) is a 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 (G/ATOR Block 1) and the Ground Counter Fire/Counter Battery (G/ATOR Block 2) 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 UAS, 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.

RDT&E funding decreases $9.616M throughout the total G/ATOR program from FY18 to FY19 with the completion of DT1C/OA, DT1D/OA and initiation of DT1E in FY18. Program Management support completely migrates from RDT&E to PMC funding as G/ATOR begins Full Rate Production in FY19. Additional funding was requested in FY19 to provide necessary system enhancements such as radar emplacement/displacement improvements and a Composite Tracking Network (CTN) interface for the GB2 mission profile.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: G/ATOR Contractor Technical, Development Engineering/Block 1	15.765	16.886	18.305	0.000	18.305
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue Program/Technology Protection efforts, Reliability Improvements, Transition to Production and Producibility Enhancements to include Engineering Change Proposals that address corrective actions during DT1C/OA & DT1D/OA testing.					
FY 2019 Base Plans: -Continue Program/Technology Protection efforts, Reliability Improvements to include improving radar emplacement/displacement time thus reducing the warfighter's exposure to potential hostile threats, Transition					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air Radar*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
to Production and Producibility Enhancements to include Engineering Change Proposals that address corrective actions during DT1D/OA and DT1E/IOT&E testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increases $1.419M from FY18 to FY19 to improve radar emplacement/displacement time and finalize baseline modifications for Full Rate Production.					
Title: G/ATOR Contractor Technical, Development Engineering/Block 2 ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** -Initiate software development to support a Composite Tracking Network (CTN) interface for the GB2 mission profile. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increases $6.199M from FY18 to FY19 to initiate software development supporting a Composite Tracking Network (CTN) interface for the GB2 mission profile that will reduce Warfighter Air Surveillance gaps on the battlefield by providing tracks for both enemy aircraft and unmanned aerial vehicles.	22.355 -	0.000 -	6.199 -	0.000 -	6.199 -
Title: Government Technical Support ***Articles:*** ***Description:*** The Government Technical Support Team provides inherently governmental support functions adding depth, breath and expertise not resident in the G/ATOR Program Office. Functions include technical planning, execution and analysis across multi-disciplinary competencies to include; Systems Architecture, Radar Software Engineering, Radar Systems Engineering, Radar Decoy Engineering, Cyber Security/Information Assurance, Human Systems Integration, Safety, Program Protection, Configuration Management and the coordination necessary to enable a System of Systems interface with other programs, to include AC2SN, CTN & AFATDS, in the "Cue to Slew" kill chain to ensure platform/software compatibility. Technical Team support is	12.350 -	13.751 -	9.095 -	0.000 -	9.095 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air Radar*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
vital during the G/ATOR LRIP System's Production phase as it is the Government's responsibility to ensure that G/ATOR meets Government Performance Specification Verification. ***FY 2018 Plans:*** -Continue Government support from the following activities to enable program execution: MITRE; NAVAIR; NSWC Dahlgren; NSWC Crane; NSWC Pt Hueneme; NAWC-AD China Lake; NSWC Indian Head; AIMS; NAWCWD Pt Mugu; DTIC and CECOM. ***FY 2019 Base Plans:*** -Continue Government support from the following activities to enable program execution: MITRE; NAVAIR; NSWC Dahlgren; NSWC Crane; NSWC Pt Hueneme; NAWC-AD China Lake; NSWC Indian Head; AIMS; NAWCWD Pt Mugu; DTIC; AC2SN PMO Quantico; AMERDEC Redstone Arsenal and CECOM. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Government Technical Support funding decreases $4.656M from FY18 to FY19 as developmental and testing efforts are completed to include the completion of DT1C/OA and DT1D/OA testing in FY18.					
Title: G/ATOR: Test and Evaluation	25.140	23.242	11.140	0.000	11.140
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete G/ATOR Block 1 (GB 1) Operational Assessment (OA), G/ATOR Block 2 (GB 2) Development Test (DT1D/OA) and planning for DT1E/IOT&E. -Complete procurement of ammunition (Rockets, Mortars and Artillery) to support DT1E/IOT&E. -Initiate DT1E/IOT&E. ***FY 2019 Base Plans:*** -Complete DT1E/IOT&E. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air Radar*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
T&E funding decreases $12.102M from FY18 to FY19 with the completion of DT1C/OA, DT1E/OA and initiation of DT1E in FY18.					
Title: G/ATOR: Management Services & Travel	3.250	0.766	0.290	0.000	0.290
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to support engineering, management & logistics program office support and program office travel in support of system development and development tests DT1D/OA and DT1E tests. ***FY 2019 Base Plans:*** Provide program office travel in support of system development and DT1E/IOT&E testing. ***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	78.860	54.645	45.029	0.000	45.029

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/0604504N/0718: *AIR CONTROL MATCALS*	0.310	11.508	6.438	-	6.438	6.675	3.158	2.676	2.739	Continuing	Continuing
• PMC/7000: *INITIAL SPARES-G/ATOR*	11.193	16.840	13.018	-	13.018	13.235	13.506	13.805	14.102	Continuing	Continuing
• PMC/4655: *GRND/AIR TASK ORIENTED RADAR*	122.563	139.167	224.969	-	224.969	273.022	284.592	298.024	19.307	73.943	1,649.522

Remarks

D. Acquisition Strategy

The Ground/Air Task Oriented Radar (G/ATOR) is a multi-role, ground-based, expeditionary radar that replaces five legacy radar systems and provides the USMC Air Defense and Air Surveillance (AD/AS) (G/ATOR Block 1), Counterfire/Targeting (G/ATOR Block 2), and Air Traffic Control (G/ATOR Block 4) capability. The AD/AS (GB1) development effort was competitively awarded in 2007 and completed Milestone C in FY14. Development of the Counterfire/Targeting (GB2) capability was

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air Radar*

initiated in FY10 with a RFI to industry, followed by a Business Case Analysis (BCA) to select the most cost effective procurement strategy. The results of the BCA indicated that a sole source contract to Northrup Grumman Electronic Systems (NGES) was the most cost effective solution. Thus, the GB2 development contract awarded in August FY15.

E. Performance Metrics

Earned Value Management
Integrated Master Schedule
OSD Financial Benchmarks
Technical Performance Measures
Probability of Program Success (PoPS) Assessments
Reliability: Hardware and Software

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air 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
G/ATOR BLOCK 1 DEVELOPMENT	C/CPIF	NORTHROP GRUMMAN SYSTEMS CORPORATION : LINTHICUM HEIGHTS, MD	168.950	15.765	Dec 2016	16.886	Dec 2017	18.305	Dec 2018	-		18.305	Continuing	Continuing	Continuing
G/ATOR BLOCK 2 SOFTWARE DEVELOPMENT	C/CPFF	NORTHROP GRUMMAN SYSTEMS CORPORATION : LINTHICUM HEIGHTS, MD	38.408	22.355	Mar 2017	0.000		6.199	Dec 2018	-		6.199	Continuing	Continuing	Continuing
		Subtotal	207.358	38.120		16.886		24.504		-		24.504	Continuing	Continuing	N/A

Remarks

The funding increases $7.618M from FY18 to FY19 supporting both G/ATOR emplacement/displacement improvements reducing the warfighter's exposure to potential hostile threats and developing the software necessary to support a Composite Tracking Network (CTN) interface for the GB2 mission profile that will reduce Warfighter Air Surveillance gaps on the battlefield by providing tracks for both enemy aircraft and unmanned aerial vehicles. Award dates reflected are the actual obligation date for the first incremental award. The Northrop Grumman Product Development contract is incrementally funded throughout the fiscal year.

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
FFRDC TECHNICAL SUPPORT	FFRDC	MITRE : BOSTON, MA	4.238	1.044	Dec 2016	0.726	Dec 2017	0.726	Dec 2018	-		0.726	Continuing	Continuing	Continuing
NSWC TECHNICAL SUPPORT	WR	NSWC DAHLGREN : DAHLGREN, VA	31.521	7.194	Dec 2016	6.425	Dec 2017	2.016	Dec 2018	-		2.016	Continuing	Continuing	Continuing
NSWC TECHNICAL SUPPORT	WR	NSWC CRANE : CRANE, IN	0.785	0.264	Dec 2016	0.276	Dec 2017	0.278	Dec 2018	-		0.278	Continuing	Continuing	Continuing
NSWC TECHNICAL SUPPORT	WR	NSWC PHD : DAM NECK, VA	2.270	0.650	Dec 2016	0.578	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
NAVAIR TECHNICAL SUPPORT	WR	NAWC AD : CHINA LAKE, CA	0.035	0.020	Dec 2016	0.020	Dec 2017	0.020	Dec 2018	-		0.020	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	Project (Number/Name) 9C89 / *Marine Ground-Air 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
NAVAIR TECHNICAL SUPPORT	WR	NAVAIR : PAX RIVER, MD	0.000	1.698	Dec 2016	2.761	Dec 2017	1.788	Dec 2018	-		1.788	Continuing	Continuing	Continuing
NSWC TECHNICAL SUPPORT	WR	NWSC-IH : INDIAN HEAD, MD	0.318	0.305	Dec 2016	0.345	Dec 2017	0.350	Dec 2018	-		0.350	Continuing	Continuing	Continuing
AIMS TECHNICAL SUPPORT	WR	AIMS : ROBINS AFB, GA	0.000	0.250	Dec 2016	0.250	Dec 2017	0.255	Dec 2018	-		0.255	Continuing	Continuing	Continuing
NAWCWD TECHNICAL SUPPORT	WR	NAWCWD : PT MUGU, CA	0.212	0.665	Dec 2016	0.675	Dec 2017	0.338	Dec 2018	-		0.338	Continuing	Continuing	Continuing
DTIC TECHNICAL SUPPORT	WR	DTIC : FT BELVOIR, VA	0.140	0.260	Dec 2016	0.280	Dec 2017	0.280	Dec 2018	-		0.280	Continuing	Continuing	Continuing
AFATDS TECHNICAL SUPPORT	WR	CECOM : ABERDEEN, MD	0.000	0.000		1.415	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
AMERDEC TECHNICAL SUPPORT	WR	AMERDEC : REDSTONE ARSENAL , AL	0.000	0.000		0.000		1.049	Dec 2018	-		1.049	0.000	1.049	-
CTN TECHNICAL SUPPORT	WR	AC2SN PMO PEO LS : QUANTICO, VA	0.000	0.000		0.000		1.995	Dec 2018	-		1.995	0.000	1.995	-
Prior Years Cumulative Funding	Various	N/A : N/A	4.089	0.000		0.000		0.000		-		0.000	0.000	4.089	-
		Subtotal	43.608	12.350		13.751		9.095		-		9.095	Continuing	Continuing	N/A

Remarks

Award dates reflected are the actual obligation date for the first incremental award. Most activities, excluding MITRE are incrementally funded throughout the fiscal year. The ($1.049M) increase in AMERDEC Technical Support provides Radar Decoy Engineering/Technical Services and the ($1.995M) increase in CTN Technical Support provides for G/ATOR/CTN/AC2SN interface efforts in support of the GB2 mission.

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
PRIME CONTRACTOR TEST SUPPORT	C/CPIF	NORTHROP GRUMMAN SYSTEMS	5.142	3.409	Dec 2016	4.102	Dec 2017	1.876	Dec 2018	-		1.876	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air 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
		CORPORATION : LINTHICUM HEIGHTS, MD													
TEST SUPPORT	WR	NSWC DAHLGREN : DAHLGREN, VA	2.218	3.120	Dec 2016	3.416	Dec 2017	2.854	Dec 2018	-		2.854	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	MIPR	AMRDEC : REDSTONE ARSENAL, AL	6.616	0.310	Dec 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
TEST SUPPORT	WR	AC2SN PEO LS : QUANTICO, VA	1.000	0.623	Dec 2016	0.595	Dec 2017	0.235	Dec 2018	-		0.235	0.000	2.453	-
TEST SUPPORT	MIPR	JTIC : FT HUACHUCA, AZ	0.248	0.062	Dec 2016	0.117	Dec 2017	0.120	Dec 2018	-		0.120	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	Various	NSWC-FALLBROOK : CRANE, IN	4.417	2.692	Dec 2016	2.884	Dec 2017	0.478	Dec 2018	-		0.478	Continuing	Continuing	Continuing
TEST EVALUATION SUPPORT	C/CPIF	MCOTEA : QUANTICO, VA	1.880	0.080	Apr 2017	0.107	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
TEST SUPPORT	Various	NSWC CORONA : CORONA, CA	2.302	1.456	Dec 2016	1.540	Dec 2017	0.514	Dec 2018	-		0.514	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	Various	NSWC PHD : DAM NECK, VA	4.835	1.897	Dec 2016	1.926	Dec 2017	0.645	Dec 2018	-		0.645	Continuing	Continuing	Continuing
TEST ASSET PROCUREMENT	C/CPFF	MCSC : QUANTICO, VA	2.669	9.221	Dec 2016	1.019	Dec 2017	0.000		-		0.000	0.000	12.909	-
TEST PLANNING/ SUPPORT	WR	JSF PMO : WASHINGTON , DC	0.000	0.000		0.770	Dec 2017	0.675	Dec 2018	-		0.675	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	WR	NAWCWD : PT MUGU, CA	0.000	0.000		0.343	Dec 2017	0.251	Dec 2018	-		0.251	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	WR	NAVSEA/PMR-51 : WASHINGTON, DC	0.000	0.000		0.540	Dec 2017	0.452	Dec 2018	-		0.452	Continuing	Continuing	Continuing
TEST PLANNING/ SUPPORT	WR	NAVAIR : PAX RIVER, MD	0.000	0.000		0.766	Dec 2017	0.676	Dec 2018	-		0.676	Continuing	Continuing	Continuing
TEST OPERATOR SUPPORT	Various	MARFOR : Various	0.942	0.240	Dec 2016	0.250	Dec 2017	0.175	Dec 2018	-		0.175	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air 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 RANGE SUPPORT	WR	YPG : YUMA, AZ	0.551	0.440	Dec 2016	1.390	Dec 2017	0.695	Dec 2018	-		0.695	Continuing	Continuing	Continuing
TEST RANGE SUPPORT	WR	NAWCWD : PT MUGU, CA	0.000	0.000		1.765	Dec 2017	0.784	Dec 2018	-		0.784	Continuing	Continuing	Continuing
TEST FACILITY SUPPORT	WR	SCSC : WALLOPS IS, MD	0.000	0.465	May 2017	0.372	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
TEST FACILITY SUPPORT	WR	MCAS YUMA : YUMA, AZ	0.000	0.810	May 2017	0.825	Dec 2017	0.420	Dec 2018	-		0.420	0.000	2.055	-
TEST FACILITY SUPPORT	WR	MCAS CPNC : ATLANTIC FIELD, NC	0.000	0.315	May 2017	0.000		0.000		-		0.000	0.000	0.315	-
TEST FACILITY SUPPORT	WR	MCB 29 PALMS : 29 PALMS, CA	0.000	0.000		0.515	Dec 2017	0.290	Dec 2018	-		0.290	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	N/A : N/A	5.381	0.000		0.000		0.000		-		0.000	0.000	5.381	-
		Subtotal	38.201	25.140		23.242		11.140		-		11.140	Continuing	Continuing	N/A

Remarks

Overall, the funding decrease of $12.102M is due to the completion of DT1C/OA and DT1D/OA, as well as, the initiation DT1E during FY18.

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/FP	MCSC : MCSC - QUANTICO, VA	8.127	2.950	Nov 2016	0.471	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
TRAVEL	Various	MCSC : QUANTICO, VA	1.125	0.300	Sep 2017	0.295	Sep 2018	0.290	Sep 2019	-		0.290	Continuing	Continuing	Continuing
		Subtotal	9.252	3.250		0.766		0.290		-		0.290	Continuing	Continuing	N/A

Remarks

The funding decreases of $0.476M from FY18 to FY19 with the complete migration of $0.471M program management support from RDT&E to PMC funding as G/ATOR begins Full Rate Production in FY19. Award date for travel reflects the last month of the Fiscal Year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	Project (Number/Name) 9C89 / *Marine Ground-Air 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	298.419	78.860		54.645		45.029		-		45.029	Continuing	Continuing	N/A

Remarks

RDT&E funding decreases $9.616M throughout the total G/ATOR program from FY18 to FY19 with the completion of DT1C/OA, DT1D/OA and initiation of DT1E in FY18.
Additionally, Program Management support completely migrates from RDT&E to PMC funding as G/ATOR begins Full Rate Production in FY19.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air Radar*

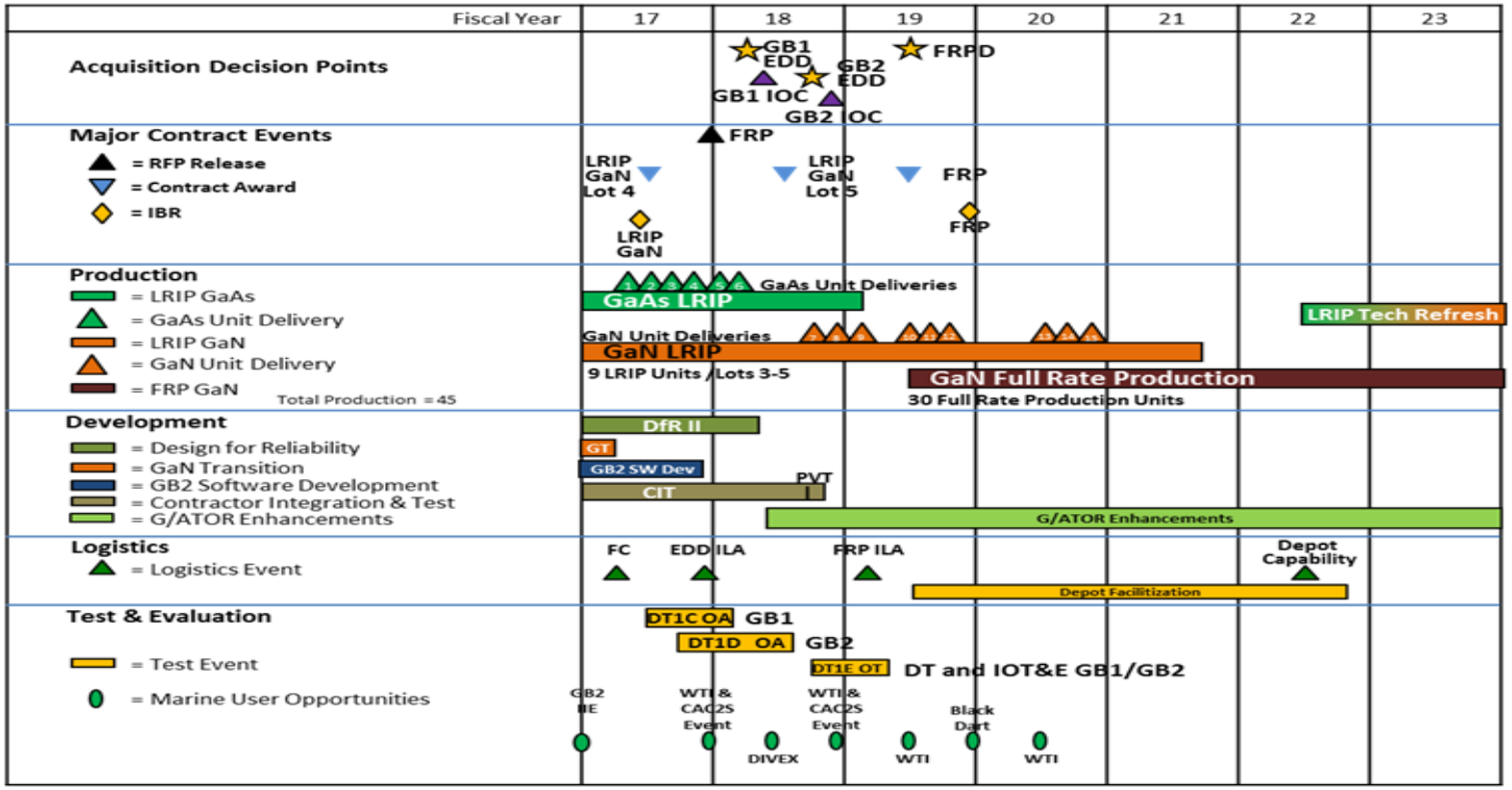


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air Radar*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9C89				
Gallium Arsenide (GaAs) Radar: GB1 Developmental Test (DT1C)	2	2017	4	2017
Gallium Arsenide (GaAs) Radar: GB1 Operational Assessment (OA)	4	2017	1	2018
Gallium Arsenide (GaAs) Radar: GB1 Radar IOC	2	2017	2	2018
Gallium Arsenide (GaAs) Radar: LRIP Tech Refresh	3	2022	4	2022
Gallium Nitride (GaN) Radar: GaN Transition	1	2017	1	2017
Gallium Nitride (GaN) Radar: LRIP Lot 4 Contract Award	2	2017	2	2017
Gallium Nitride (GaN) Radar: GB1/GB2 Developmental Test (DT1E)	3	2018	1	2019
Gallium Nitride (GaN) Radar: GaN PVT	4	2018	4	2018
Gallium Nitride (GaN) Radar: GB1/GB2 IOTE	1	2019	2	2019
Gallium Nitride (GaN) Radar: LRIP Lot 5 Contract Award	3	2018	3	2018
Gallium Nitride (GaN) Radar: FRPD	3	2019	3	2019
Gallium Nitride (GaN) Radar: FRP	3	2019	4	2022
Gallium Nitride (GaN) Radar: LRIP Tech Refresh	3	2022	4	2022
Ground Weapons Locating Radar (GWLR): GB2 Software Development	1	2017	4	2017
Ground Weapons Locating Radar (GWLR): GB2 Developmental Test (DT1D)	4	2017	1	2018
Ground Weapons Locating Radar (GWLR): GB2 Operatonal Assessment (OA)	2	2018	3	2018
Ground Weapons Locating Radar (GWLR): GB2 IOC	4	2018	4	2018
Development: Design for Reliability II	1	2017	2	2018
Development: G/ATOR Enhancements	3	2018	4	2023
Logistics: Fielding Conference	2	2017	2	2017
Logistics: Early Deployment Decision Independent Logistics Assessment (ILA)	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204460M / *(U)Ground/Air Task Oriented Radar (G/ATOR)*	**Project (Number/Name)** 9C89 / *Marine Ground-Air Radar*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Logistics: FRP ILA	1	2019	1	2019
Logistics: Depot Facilitzation (LRU Repair & IROAN)	3	2019	4	2022
Logistics: Depot IROAN Capability	3	2022	3	2022

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204571N *I Consolidated Trng 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**
Total Program Element	405.618	44.435	66.518	104.903	-	104.903	101.388	49.738	32.940	26.758	Continuing	Continuing
0604: *Training Range & Instr Dev*	148.520	3.247	0.003	4.238	-	4.238	5.573	3.577	3.646	3.727	Continuing	Continuing
1427: *Surface Tactical Team Trainer (STTT)*	106.880	12.145	15.274	42.046	-	42.046	56.831	36.284	23.820	17.433	Continuing	Continuing
2124: *Air Warfare Training*	48.078	1.438	1.585	1.709	-	1.709	1.710	1.634	1.665	1.699	Continuing	Continuing
3093: *TACTS/LATR Replacement*	81.126	12.444	48.473	56.154	-	56.154	35.307	6.773	3.809	3.899	Continuing	Continuing
3356: *High Fidelity Surface Trainers*	21.014	6.457	1.183	0.756	-	0.756	1.967	1.470	0.000	0.000	0.000	32.847
9999: *Congressional Adds*	0.000	8.704	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.704

A. Mission Description and Budget Item Justification

0604 - Training Range and Instrumentation Development project develops specialized instrumentations for fleet readiness training while minimizing life cycle costs. Tasks include development of the following: Large Area Tracking Range (LATR) improvements, technology improvements for fixed and portable Anti-Submarine Warfare training ranges, and Tactical Training Range (TTR) infrastructure improvements to include: Joint Display Subsystem, Radar Acquisition Display Subsystem, Electronic Warfare server, Link 16 interface, TTR Rotary Wing Tracking System technology improvements, Radiant Mercury Cross Domain Solution and Smart Antenna technology for automated frequency deconfliction. FY18 to FY19 funding increase represents support to planned LATR, TTR and Ocean System development programs. It also includes increased funding of $.565M for Smart Antenna development.

1427 - Surface Tactical Team Trainer (STTT) develops modifications during sustainment of Battle Force Tactical Training (BFTT) system and modernization into the Advanced Training Domain (ATD). Both BFTT and ATD are the core system that is used to integrate the weapon system elements, and combat system components to create the Total Ship Training Capability (TSTC). BFTT and ATD continue 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.

2124 - Air Warfare Training Development (AWTD) provides for risk mitigation and next generation platform, Unmanned Aerial Systems (UAS), Live Virtual Constructive (LVC) and associated visualization component development for distributed mission training, and for stand-alone and small footprint deployable devices. Support the

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204571N *I Consolidated Trng Sys Dev*

Navy Aviation Simulation Master Plan (NASMP) upgrade efforts and Type/Model/Series programs with advanced visual system display configurations requirements. Provide for Open Architecture (OA), and common systems interface applications. Assess trainee cognitive requirements and the development and incorporation of next generation LVC, UAS constructive and associated visualization component technologies. Additionally, AWTD provides for advanced virtual component fidelity improvements for LVC capability which includes the "Mobility" Part-Task Trainers and the Multiplex Data Bus Controller Translator Transmitter enabling technologies. LVC technologies will facilitate advanced, cost effective weapons and tactics training and emerging capability requirements in the Air-Sea Battle Space and Naval Integrated Fire Control-Counter Air capabilities development.

3093 - The Tactical Combat Training System (TCTS) Increment II will provide an improved environment for air combat training utilizing a secure air-to-air and air-to-ground data link, and will provide rangeless operation capability to Forward Deployed Naval Forces (FDNF). TCTS Increment II will provide encryption and an enhanced threat environment, as well as airborne participant instrumentation for multiple fixed and rotary wing platforms. Engineering Development Models (EDM) units procured in FY18 (41) and FY19 (16) will support Engineering and Developmental Testing events thru FY20. The EDMs will be specifically utilized for testing in the following areas: Environmental Qualification, Software, High Accelerated Lifecycle, Ground System Integration, Airborne Subsystem Air Worthiness and Performance, Shipboard Ground Station, Internal Mount and Rack Mounted Subsystem (Internal Mount) Airworthiness and Performance and JSF Airworthiness and Performance. FY19 funding supports both multiple government and contractor development efforts, as well as, procurement of the EDMs. These efforts support a Milestone C of 1Q FY20 and a Fleet IOC need date of 2Q FY21 in order to address critical OPSEC concerns.

3356- Funds high fidelity Aegis Integrated Air and Missile Defense (IAMD) individual, instructor, strike group and team trainers for all Advanced Capability Build (ACB) and below Aegis baselines. This line also provides funds for the research and development of advanced technologies to support Aegis Ballistic Missile Defense (BMD) builds and Command, Control, Communication, Computer, and Intelligence (C4I) advanced technology upgrades to Aegis BMD Ashore Team Trainer at [the Center for Surface Combat Systems (CSCS)] Unit Dam Neck. This line supports Surface Training Advanced Virtual Environment (STAVE) methodology by researching and developing trainers that will create an immersive and interactive learning environment and support both CNO High Velocity Learning and Ready Relevant Learning intent. NOTE: In FY18, Mine Warfare Synthetic Training requirements previously captured within PE 0204571N / Project 3356 [(High Fidelity Surface Trainer)] were realigned to PE 0603502N / Project 1235 [(Mine Warfare Planning and Analysis)].

9999/C301 - The Barking Sands Tactical Underwater Range (BARSTUR) is a critical Pacific Missile Range Facility (PMRF) undersea training range that was installed in FY94 and is well beyond its service life. Funding is provided to accelerate the initial analysis and environmental impact studies related to replacing and modernizing BARSTUR.

JUSTIFICATON 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.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204571N *I Consolidated Trng Sys Dev*

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	38.593	66.518	78.419	-	78.419
Current President's Budget	44.435	66.518	104.903	-	104.903
Total Adjustments	5.842	0.000	26.484	-	26.484
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.895	0.000			
• Program Adjustments	0.000	0.000	27.358	-	27.358
• Rate/Misc Adjustments	-0.001	0.000	-0.874	-	-0.874
• Congressional General Reductions Adjustments	-0.012	-	-	-	-
• Congressional Directed Reductions Adjustments	-2.250	-	-	-	-
• Congressional Add Adjustments	9.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Training Range Enhancements*	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 ($0.631) 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 2019 funding request was reduced by $2.654 million to account for the availability of prior year execution balances.

Transfer from OPN to RDTEN in the amount of $4.942 million.

0604:

Large Area Training Range (LATR): Due to a change in planned software releases to incorporate Live, Virtual and Constructive (LVC) Technology into LATR, release 6.1 was deleted. Release 6.3 will be completed in FY17 and the scheduled software releases updated for the FYDP. Updated R-4/4a.

Tactical Training Range (TTR): Funding increased from PB18 in FY19 by $.565M and FY20 by $1.135M for Smart Antenna development.

2124:
Human/Instructional Systems Integration: Common Instruction Systems/Semi-Automated Forces (SAF) and Unmanned-Aerial Systems Interface Selection and Training Technology (U-ASISTT) Development changed from FY17-22 to FY17-19 in order to prioritize Fleet requirements for Augmented Reality Operational Flight Trainer (OFT) Demo FY19, Next Generation Threat System (NGTS) Analysis and Reporting FY19-22 and Crew Enabled Role Player FY19-23. T-45 Augmented Reality Visual System (ARVS) Part Task Trainer (PTT) added in FY18 as a priority Fleet requirement. Updated R-4/4a.

Sensors and Environment: Common Platform/Sensors and Environment (Models/Tools) changed from FY17-FY22 to FY17-19 in order to prioritize Fleet requirements for Near Eye Display Metrology System FY19, Virtual Reality (VR) and Haptic for Flight Deck Crew Demo FY20 and Collaborative Database Rapid Terrain Generation FY19-23. Updated R-4/4a.

Live, Virtual, Constructive (LVC) and Visuals: U-ASISTT Development Integration to LVC schedule changed from FY17-22 to FY17-18 in order to prioritize Fleet requirements for Flight Deck Trainer Expansion Pack FY19-23. Updated R-4/4a.

3093:
TACTS/LATR Replacement: Milestone C moved from 1QTR 2021 to 1QTR 2020 to accommodate Fleet requirements for an accelerated encryption capability. LRIP for Airborne Subsystem (POD), Ground Subsystem, Remote Range Unit, Portable Support Equipment Subsystem will now run from 1QTR 2020 through 4QTR 2022. Added a Production Decision for the Internal Mounts in 1QTR 2021 with the LRIP for the Internal Mounts beginning in 1QTR 2021 and running through 4QTR 2022. Full Rate Production will begin 1QTR 2023. Developmental Test C was moved from 4QTR 2020 back to 1QTR 2020. The Next Generation Technology Upgrades were pushed out to 1QTR 2023, with delivery in 4QTR 2023. Updated R-4/4a.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 0604 / *Training Range & Instr 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
0604: *Training Range & Instr Dev*	148.520	3.247	0.003	4.238	-	4.238	5.573	3.577	3.646	3.727	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Training Range and Instrumentation Development project develops specialized instrumentations for fleet readiness training while minimizing life cycle costs. Tasks include development of the following: Large Area Tracking Range (LATR) improvements, technology improvements for fixed and portable Anti-Submarine Warfare training ranges, and Tactical Training Range (TTR) infrastructure improvements to include: Joint Display Subsystem, Radar Acquisition Display Subsystem, Electronic Warfare server, Link 16 interface, TTR Rotary Wing Tracking System technology improvements, Radiant Mercury Cross Domain Solution and Smart Antenna technology for automated frequency deconfliction. FY18 to FY19 funding increase represents support to planned LATR, TTR and Ocean System development programs. It also includes increased funding of $.565M for Smart Antenna development.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: LATR	2.452	0.003	2.416	0.000	2.416
Articles:	-	-	-	-	-
Description: Design, integrate and test modules to eliminate obsolete components in the Large Area Tracking Range (LATR) Pod. Design, integrate and test LATR software baseline upgrades. Design, integrate and test Participant Instrumentation Packages (PIP) modules to address obsolescence, high failure components and to improve operability and performance. Conduct and complete installation of the Ground System Rehosts. Conduct and complete security testing and assessment for LATR system certification and accreditation for Ground System Rehosts. Develop, test and integrate software and hardware modifications to system test sets. Develop, test and integrate LATR data translators. Conduct studies to identify sub-projects required through FY23. Complete ground system and PIP refresh sub-projects, in conjuction with, semi-annual system block upgrades. Conduct LATR Operational Security (OPSEC) Posture Improvements Sub-Project, Shipboard and Rotary Wing Technology Wing Upgrade (LSRTU) and LATR Navigation Technology Refresh (LNTR).					
FY 2018 Plans: Continue to develop operational system improvements and solutions to eliminate LATR Obsolescence issues.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Develop and test Large Area Tracking Range (LATR) ground software 6.4 changes to incorporate Live Virtual Constructive (LVC) Technology. Continue to develop operational system improvements and solutions to eliminate LATR obsolescence issues. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $2.413M from FY 2018 to FY 2019 due to FY 2018 being reduced to $.003 to redirect effort toward 3093 TACTS/LATR Replacement. The funding increase represents support to planned Large Area Tracking Range (LATR) development programs.					
Title: TTR	0.554	0.000	1.232	0.000	1.232
Articles:	-	-	-	-	-
Description: Develop and test upgrades to the Joint Display Subsystem (JDS), Radar Acquisition Display Subsystem (RADS), and Electronic Warfare (EW) server. Develop and test upgrades to the Link-16 Interface, JDS, RADS, and EW server. Develop and test Smart Antenna technology for automated frequency deconfliction. Disruptions and limitations in the Live-to-Virtual (LV) tactical radio communication segment of the Navy Continuous Training Environment (NCTE) network have interfered with the goals and objectives of Fleet Synthetic Training (FST) events. The Smart Antenna improves utilization of the frequency spectrum in the relay tower by performing calculations to predict RF interference and then avoid RF interference by assigning interfering frequency pairs to antenna pairs with greater isolation, thereby deconflicting frequencies. ***FY 2018 Plans:*** Funds for FY18 have been eliminated. ***FY 2019 Base Plans:*** Develop and test 2019.1 upgrades to the Joint Display Subsystem (JDS), Radar Acquisition Display Subsystem (RADS), and Electronic Warfare (EW) server to remain in concert with evolving threat and tactical training requirements. Develop operational systems improvements to the Rotary Wing Tracking System. Develop and test Tactical Training Ranges (TTR) ground software changes to incorporate Live, Virtual and Constructive (LVC) technology. Develop and test Smart Antenna technology for automated frequency deconfliction. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr 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 of $1.232M from FY 2018 to FY 2019 due to FY 2018 funds being completely eliminated to redirect effort toward 3093 TACTS/LATR Replacement. The funding increase represents support to planned Tactical Training Ranges (TTR) development programs. FY 2019 was increased by an additional $.565 to develop and test Smart Antenna technology for automated frequency deconfliction.					
Title: Ocean Systems ***Articles:*** ***Description:*** Research, develop, and test technology improvements for fixed and portable Anti-Submarine Warfare (ASW) training ranges. ***FY 2018 Plans:*** Funds for FY18 have been eliminated. ***FY 2019 Base Plans:*** Complete a gap analysis between Sea Raven Display and Control Subsystem (DCS) and other DCS systems. Document the requirements identified by the gaps and develop a Product Line approach for Sea Raven. Develop a plan for sun-setting Naval Gunfire Scoring System (NGSS) and Navy Tracking and Display Software (NTADs). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.590M from FY 2018 to FY 2019 due to FY 2018 funds being completely eliminated to redirect effort toward 3093 TACTS/LATR Replacement. The funding increase represents support to planned Ocean System development programs.	0.241 -	0.000 -	0.590 -	0.000 -	0.590 -
Accomplishments/Planned Programs Subtotals	3.247	0.003	4.238	0.000	4.238

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/4204: *Weapons Range Support Equipment (WRSE)/ LSRTU/Ocean Systems*	58.116	72.110	93.864	-	93.864	85.269	73.794	99.618	103.549	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

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

FY19 increase in OPN 4204 for replacement of Barking Sands Tactical Undersea Range (BARSTUR) fixed anti-submarine warfare (ASW) range instrumentation.

D. Acquisition Strategy

The Training Range and Instrumentation Development (TRID) program is a non-ACAT program. The integrated program teams that develop new TRID capabilities include government and contractor engineering personnel.

E. Performance Metrics

Metric/Description:
Naval Air Warfare Center-Aircraft Division (NAWC-AD): Completion of one Large Area Tracking Range (LATR) upgrade per year. Successful application of system engineering processes. Site acceptance of product improvements.

Jacobs Eng: Site acceptance of LATR product improvements. Successful design, development and testing of product improvements and new capabilities.

Naval Air Warfare Center Weapons Division(NAWC-WD): Completion of one Tactical Training Range (TTR) upgrade per year. Successful application of system engineering processes. Site acceptance of product improvements.

Jacobs Eng: Site acceptance of TTR product improvements. Successful design, development, and testing of product improvements and new capabilities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 0604 / *Training Range & Instr 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
Hardware Development	C/CPFF	JACOBS ENG : RIDGECREST, CA	12.409	0.750	Jan 2017	0.000		1.070	Jan 2019	-		1.070	0.000	14.229	14.229
Hardware Development	WR	NUWC : NEWPORT, RI	0.205	0.250	Jan 2017	0.000		0.525	Nov 2018	-		0.525	Continuing	Continuing	Continuing
Hardware Development	WR	NAWCTSD : ORLANDO, FL	0.000	0.000		0.000		0.565	Nov 2018	-		0.565	Continuing	Continuing	Continuing
Software Development	C/CPFF	JACOBS ENG : RIDGECREST, CA	5.075	0.364	Jan 2017	0.000		0.350	Jan 2019	-		0.350	0.000	5.789	5.789
Software Development	WR	NAWC-AD : PAX RIVER, MD	8.429	0.606	Dec 2016	0.000		0.578	Nov 2018	-		0.578	Continuing	Continuing	Continuing
Software Development	WR	NRL : WASHINGTON, DC	0.475	0.150	Dec 2016	0.000		0.143	Nov 2018	-		0.143	Continuing	Continuing	Continuing
Prior Year Prod Dev No Longer Funded in the FYDP	Various	Various : Various	100.040	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	126.633	2.120		0.000		3.231		-		3.231	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	NAWC-AD : PAX RIVER, MD	0.991	0.748	Dec 2016	0.003	Nov 2017	0.704	Nov 2018	-		0.704	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWC-WD : CHINA LAKE, CA	0.474	0.152	Nov 2016	0.000		0.089	Nov 2018	-		0.089	Continuing	Continuing	Continuing
Systems Engineering	WR	NSWC : CORONA, CA	0.860	0.125	Nov 2016	0.000		0.119	Nov 2018	-		0.119	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWC-WD : POINT MUGU, CA	0.025	0.025	Nov 2016	0.000		0.024	Nov 2018	-		0.024	Continuing	Continuing	Continuing
Prior Year Support No Longer Funded in the FYDP	Various	Various : Various	10.576	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	12.926	1.050		0.003		0.936		-		0.936	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 0604 / *Training Range & Instr Dev*	

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 the FYDP	Various	Various : Various	5.299	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	5.299	0.000		0.000		0.000		-		0.000	Continuing	Continuing	N/A

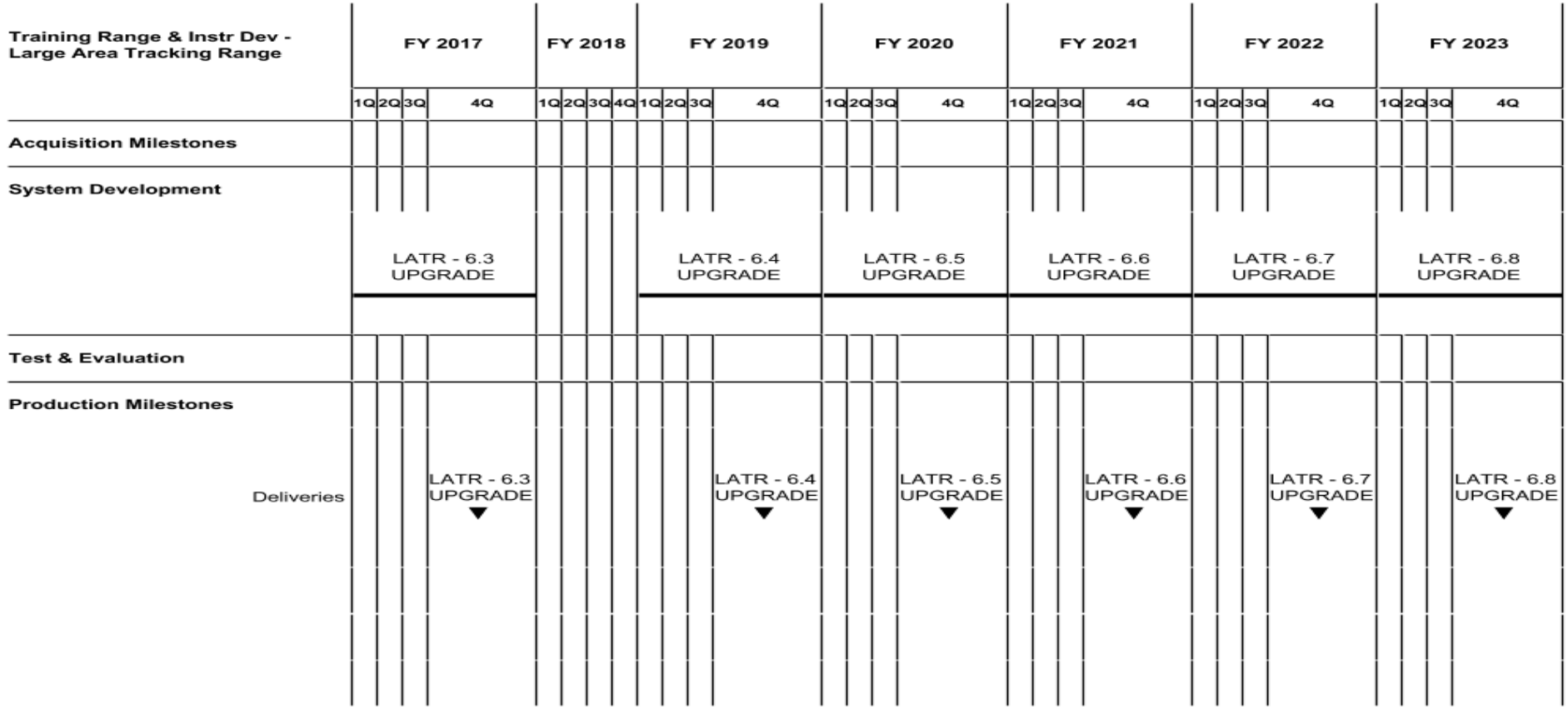
Management Services ($ in Millions)

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
Prog Mngt Sup	WR	NAWC-AD : PAX RIVER, MD	0.000	0.077	Dec 2016	0.000		0.071	Nov 2018	-		0.071	Continuing	Continuing	Continuing
Prior Year Support No Longer Funded in the FYDP	Various	Various : Various	3.662	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	3.662	0.077		0.000		0.071		-		0.071	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	148.520	3.247		0.003		4.238		-		4.238	Continuing	Continuing	N/A

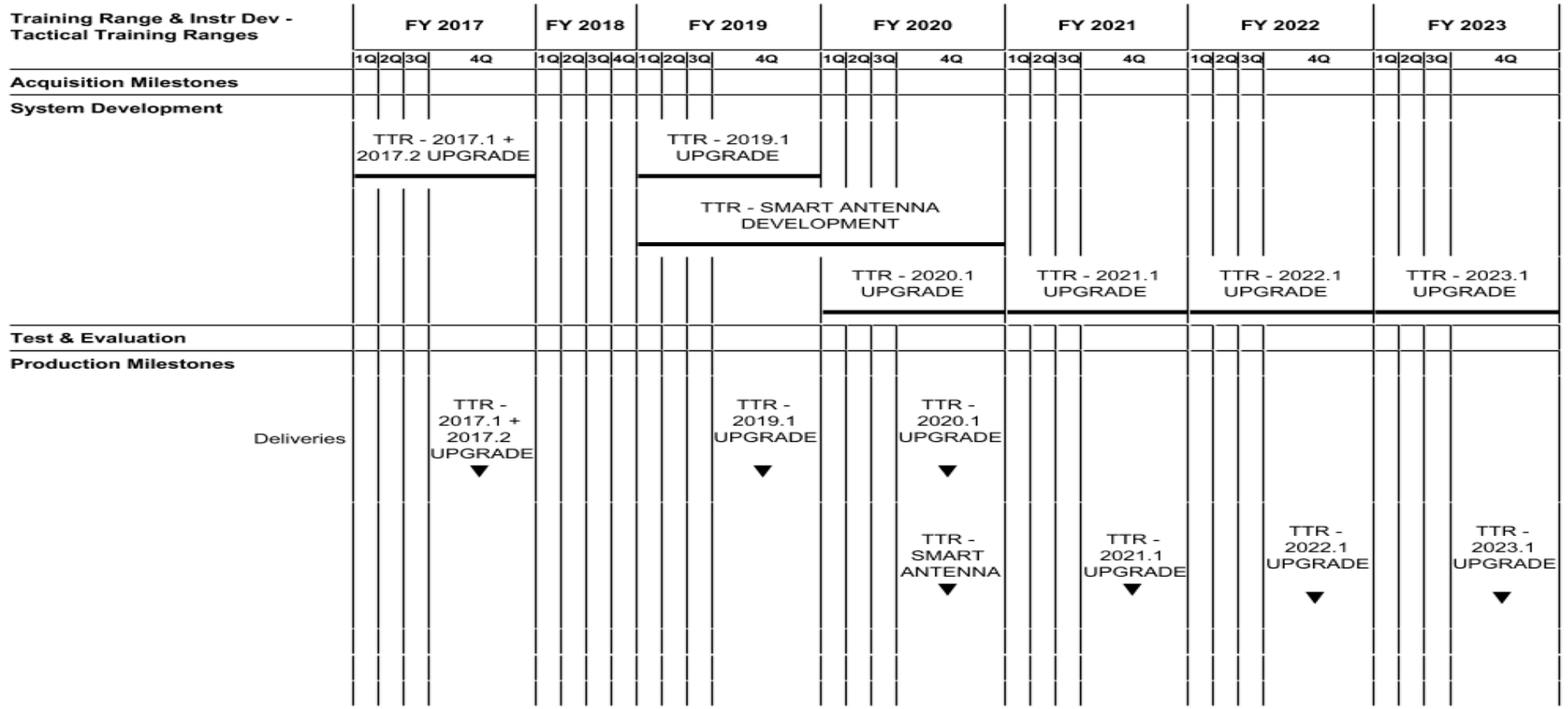
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*



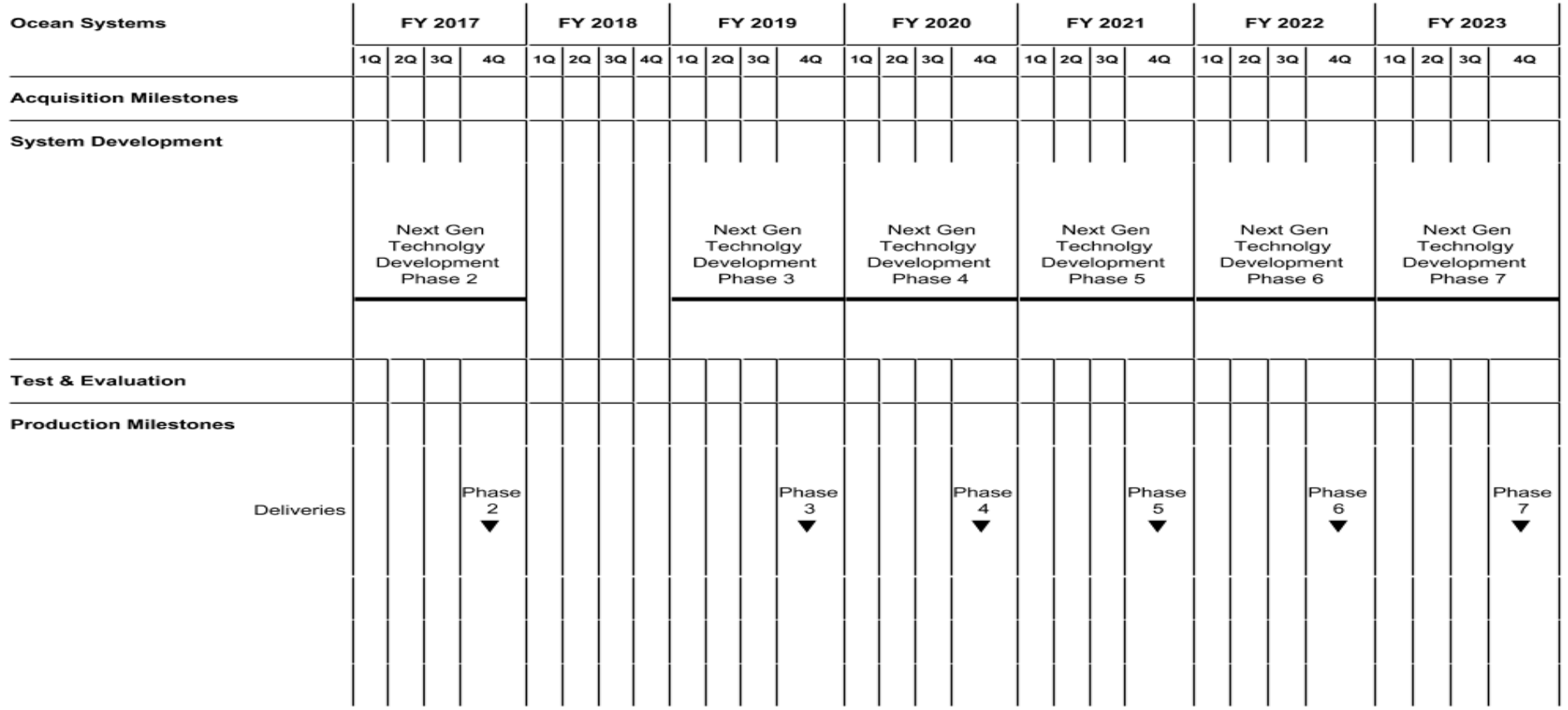
2019DON - 0204571N - 0604

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*



2019DON - 0204571N - 0604

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*



2019DON - 0204571N - 0604

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Training Range & Instr Dev - Large Area Tracking Range				
System Development: LATR - 6.3 UPGRADE	1	2017	4	2017
System Development: LATR - 6.4 UPGRADE	1	2019	4	2019
System Development: LATR - 6.5 UPGRADE	1	2020	4	2020
System Development: LATR - 6.6 UPGRADE	1	2021	4	2021
System Development: LATR - 6.7 UPGRADE	1	2022	4	2022
System Development: LATR - 6.8 UPGRADE	1	2023	4	2023
Production Milestones: Deliveries: LATR - 6.3 UPGRADE	4	2017	4	2017
Production Milestones: Deliveries: LATR - 6.4 UPGRADE	4	2019	4	2019
Production Milestones: Deliveries: LATR - 6.5 UPGRADE	4	2020	4	2020
Production Milestones: Deliveries: LATR - 6.6 UPGRADE	4	2021	4	2021
Production Milestones: Deliveries: LATR - 6.7 UPGRADE	4	2022	4	2022
Production Milestones: Deliveries: LATR - 6.8 UPGRADE	4	2023	4	2023
Training Range & Instr Dev - Tactical Training Ranges				
System Development: TTR - 2017.1 + 2017.2 UPGRADE	1	2017	4	2017
System Development: TTR - 2019.1 UPGRADE	1	2019	4	2019
System Development: TTR - SMART ANTENNA DEVELOPMENT	1	2019	4	2020
System Development: TTR - 2020.1 UPGRADE	1	2020	4	2020
System Development: TTR - 2021.1 UPGRADE	1	2021	4	2021
System Development: TTR - 2022.1 UPGRADE	1	2022	4	2022
System Development: TTR - 2023.1 UPGRADE	1	2023	4	2023
Production Milestones: Deliveries: TTR - 2017.1 + 2017.2 UPGRADE	4	2017	4	2017
Production Milestones: Deliveries: TTR - 2019.1 UPGRADE	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 0604 / *Training Range & Instr Dev*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Deliveries: TTR - 2020.1 UPGRADE	4	2020	4	2020
Production Milestones: Deliveries: TTR - SMART ANTENNA	4	2020	4	2020
Production Milestones: Deliveries: TTR - 2021.1 UPGRADE	4	2021	4	2021
Production Milestones: Deliveries: TTR - 2022.1 UPGRADE	4	2022	4	2022
Production Milestones: Deliveries: TTR - 2023.1 UPGRADE	4	2023	4	2023
Ocean Systems				
System Development: Next Gen Technolgy Development Phase 2	1	2017	4	2017
System Development: Next Gen Technolgy Development Phase 3	1	2019	4	2019
System Development: Next Gen Technolgy Development Phase 4	1	2020	4	2020
System Development: Next Gen Technolgy Development Phase 5	1	2021	4	2021
System Development: Next Gen Technolgy Development Phase 6	1	2022	4	2022
System Development: Next Gen Technolgy Development Phase 7	1	2023	4	2023
Production Milestones: Deliveries: Phase 2	4	2017	4	2017
Production Milestones: Deliveries: Phase 3	4	2019	4	2019
Production Milestones: Deliveries: Phase 4	4	2020	4	2020
Production Milestones: Deliveries: Phase 5	4	2021	4	2021
Production Milestones: Deliveries: Phase 6	4	2022	4	2022
Production Milestones: Deliveries: Phase 7	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy										Date: February 2018		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*				Project (Number/Name) 1427 / *Surface Tactical Team Trainer (STTT)*			
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**
1427: *Surface Tactical Team Trainer (STTT)*	106.880	12.145	15.274	42.046	-	42.046	56.831	36.284	23.820	17.433	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Department's submission reflects the results of a deep dive into Fleet Training Wholeness (FTW) and how to provide a means for Strike Group Training in a contested environment, in accordance with Chief of Naval Operations guidance and Fleet Training Wholeness 2025 objectives. The analysis determined the most cost effective means to provide this training is via a combination of Live Virtual Constructive (LVC) capabilities. The department of the Navy has identified 21 LVC Capabilities that can be begin in FY19 leveraging combat system product line architecture components, contract vehicles, warfare center subject matter experts, and engineering practices for iterative development. The deep dive identified that there is no other cost effective way train in a contested environment. The foundation for LVC has already been established. FY19 continues the iterative investment strategy to provide initial at sea LVC capability to train a Strike Groups in the environment they expected to fight in. The development, integration and testing of LVC's, along with ensuring interoperability with surface and air communities, will be accomplished across Integrated Warfare Systems (IWS), Navy Continuous Training Environment (NCTE), and the Navy's Tactical Training Network.

Surface Tactical Team Trainer (STTT) develops modifications during sustainment of Battle Force Tactical Training (BFTT) system and modernization into the Advanced Training Domain (ATD). Both BFTT and ATD are the core system that is used to integrate the weapon system elements, and combat system components to create the Total Ship Training Capability (TSTC). BFTT and ATD continue 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 Composite Training Unit Exercise (COMPTUEX) FST
at Sea integration into LVC environment. Continued Development is required to integrate new capabilities and interfaces to provide training for AEGIS and Ships Self Defense System (SSDS) combat system capability upgrades, and to address the Fleet's LVC FTW initiative. Additionally, modernization is needed to support the Department of Defense (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 Base Line (BL) 9.2.2 And Follow, and Ships Self Defense System (SSDS) BL 11.xAF. ATD is being hosted along with the AEGIS and SSDS combat system on Technical Insertion (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.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

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.

Develop and integrate MH-60R simulator to enable single ship basic and sustainment training, and distributed multi-ship pier-side Fleet Synthetic Training (FST) events.

Develop and Integrate Cooperative Engagement Capability (CEC) Enhanced Training (CET) to enable single ship basic and sustainment training, and distributed multi-ship pier-side FST events. CET also provide enable proficiency training of Naval Integrated Fire Control - Counter Air (NIFC-CA) capability.

Develop CEC Interim Training (CIT) capability to enable multi-ship pier-side FST events.

Develop and integrate upgrades to Battleforce Electronic Warfare Trainer (BEWT) to support soft kill training with NULKA Decoys.

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 Ships Self Defense System in support of Enhanced Sea Sparrow Missile (ESSM) and Electronic Warfare (EW) tactical improvements.

Integrate Navy Continuous Training Environment (NCTE) networking and cyber security upgrades.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Surface Tactical Team Trainer (STTT)	12.145	15.274	14.598	0.000	14.598
Articles:	-	-	-	-	-
FY 2018 Plans: BFTT 5.1.1: Complete and certify for delivery and integration on BL 9.2.1. 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Deliver Cooperative Engagement Capability (CEC) Embedded Training capability, Identification Friend or Foe (IFF) Simulator, NULKA Simulator, and MH-60R Simulator for integration and testing. Develop tactical representative training improvements to Ships Self Defense System (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:*** ATD 1.0: Deliver Advanced Training Domain (ATD) 1.0 system and software to support training on Aegis Baseline (BL) 9.2.2 and SSDS BL 11.x ATD 1.1: Conduct integration testing of ATD 1.1 with Aegis Baseline (BL) 10.x BFTT 5.1.2: Deliver Battle Force Tactical Training (BFTT) Software updates to support Fire Control Loop Improvement Program (FCLIP) on Ships Self Defense System (SSDS) ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to Issue 68032 Under execution Mark in the amount of $.676.					
Title: Fleet Training Wholeness	0.000	0.000	17.835	0.000	17.835
Articles:	-	-	-	-	-
Description: Increase in PB19 required to provide a means for Strike Group Training in a contested environment. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Develop, test and integrate Engineering Change Proposals (ECP) to implement ability to inject and tag simulated contacts into live shipboard air-search radars, for augmenting live exercises with simulation, thereby reducing the need for live training assets. This is key to providing the ability to train using live, virtual and constructive capabilities needed for fleet synthetic training underway. Failure to update the radar systems, will prevent ability to augment live underway exercises with synthetic contacts.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Develop, test and integrate changes to allow simulated contacts to be overlaid with tactical contacts, on AEGIS and Ships Self Defense System (SSDS) combat systems, which is a critical enabler for implementing live, virtual, constructive capabilities in support of fleet synthetic training underway. Failure to update combat systems will prevent the ability to safely participate in live exercises that are augmented with simulation. Develop, test and Integrate a Gun Weapon System (GWS) simulations and Electronic Optical Sensor System (EOSS) simulations to provide a means of conducting surface warfare training capability on AEGIS, and reduce dependence on live fire training. Failure to implement GWS/EOSS training capability will result in the inability to conduct effective surface warfare training. Develop changes to Cooperative Engagement Capability (CEC) to enable distribution of training data over the live CEC data links to support training of advanced tactical capabilities during fleet synthetic training exercises. Failure to update CEC will prevent fleet from training to AEGIS and SSDS Combat Systems capability advancements. Assess safety issues related to navigation distribution and develop Courses Of Action (COA) to mitigate concerns and potential hazards with conducting shipboard synthetic training underway. Failure to conduct the assessment could adversely impact the ability to safely conduct underway training in a live, virtual and constructive environment. Develop, test and Integrate combat system data collection and after-action review capability that will provide an effective means for instructors to assess operator, and crew performance during training events. Failure to develop assessment tools will impact ability to quantitatively assess operator and crew performance during training exercises. Develop, Test, and Integrate shipboard synthetic tactical radios that communicate over NCTE to enable exercise coordination between ships and shore sites for fleet synthetic events. Failure to develop synthetic tactical radios will impact ability to coordinate training exercises without the need of temporarily installed communication devices. Modify weapon systems modifications to integrate Live, Virtual, and Constructive (LVC) functionality and safety. Initiate Battle Force Tactical Training (BFTT) and Advanced Training Domain (ATD) development efforts to integrate					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
LVC capabilities. Failure of not modifying weapons systems will impact the ability for AEGIS and SSDS ships from participating in underway training events in an live, virtual and constructive environment, ultimately impacting ability to adequately conduct strike group certification training events. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase caused by Issue 19038 for Fleet Training Wholeness which starts in FY19 in the amount of $17.835. Funds will be used to execute the FY19 base plans, identified above, in support of developing the required shipboard capabilities to enable Strike Group Training in a contested environment.					
Title: DDG 1000 Wholeness/Surface Strike	0.000	0.000	9.613	0.000	9.613
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Develop, test and install embedded shipboard training capability to support organic within the lifelines and multi-ship distributed combat systems training requirements as outlined in the DDG 1000 Navy Training Support Plan (NTSP). Capability will allow DDG 1000 class ships to participate in distributed Fleet Synthetic Training (FST) events. FST events are used for advance warfare training, and work ups to strike group deployment certification. Failure to execute plans, will prevent DDG 1000 to participate, with the other ships, other services and coalition partners in FST events. DDG 1000 On-Board Trainer development will begin FY19, Shore Training facility will be upgraded to represent shipboard configuration, testing will be conducted to ensure requirement as outlined in DDG 1000 Navy training Support Plan (NTSP), and to ensure interoperability with Navy Continuous Training Environment (NCTE). Copies of the system will then be developed and installed on board DDG 1000 Class Ships. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase due to Issue 50422 for DDG 1000 Wholeness/Surface Strike implementation in the amount of $9.613.					
Accomplishments/Planned Programs Subtotals	12.145	15.274	42.046	0.000	42.046

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

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/0604307N/3357: *Aegis Training Improvement Program*	10.357	7.856	8.109	-	8.109	7.330	7.449	6.505	5.562	Continuing	Continuing
• RDTE/0604755N/3358: *SSDS Training Improvement Program*	2.808	7.554	7.973	-	7.973	8.698	10.067	9.795	9.226	Continuing	Continuing
• OPN/5664/TBD: *Other Training Equipment (Surface BFTT/TSTC portion only) New BLI FY17*	20.010	32.020	29.503	-	29.503	29.608	29.550	29.871	30.468	Continuing	Continuing

Remarks

D. Acquisition Strategy

The BFTT acquisition strategy for system development utilizes the Advanced Capability Build (ACB) development model, as mandated by OPNAV. Incremental acquisition and fielding, utilizing commercial off-the-shelf technology to the extent possible, is in accordance with OPNAV LTR Ser N86/9U179029 dtd 31 Jul 09.

E. Performance Metrics

TSTC BFTT Core component will be developed to meet the following developmental milestones. These milestones are in close alignment with AEGIS BL9.C2 and SSDS MK 2 development milestones and integration events. (see R-4)

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 1427 / *Surface Tactical Team Trainer (STTT)*	

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	C/FFP	GTS : Virginia Beach, VA	14.960	0.497	Dec 2016	0.571	Dec 2017	0.580	Dec 2018	-		0.580	Continuing	Continuing	Continuing
Systems Engineering	WR	SEA02/NSWC Dam Neck/NSWC Dahlgren : NAVSEA/ Dam Neck/NSWC Dahlgren	26.172	3.729	Dec 2016	5.824	Dec 2017	15.849	Dec 2018	-		15.849	0.000	51.574	-
		Subtotal	41.132	4.226		6.395		16.429		-		16.429	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	NSWC Dam Neck/ SEA 02 : WR/REQN	42.045	4.747	Dec 2016	5.671	Dec 2017	17.977	Dec 2018	-		17.977	Continuing	Continuing	Continuing
		Subtotal	42.045	4.747		5.671		17.977		-		17.977	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 Dam Neck/ SEA 02 : WR/REQN	13.660	1.950	Dec 2016	1.767	Dec 2017	6.125	Dec 2018	-		6.125	Continuing	Continuing	Continuing
		Subtotal	13.660	1.950		1.767		6.125		-		6.125	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	NSWC Dam Neck/ SEA02 : WR/REQN	10.043	1.222	Dec 2016	1.441	Dec 2017	1.515	Dec 2018	-		1.515	Continuing	Continuing	Continuing
		Subtotal	10.043	1.222		1.441		1.515		-		1.515	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 1427 / *Surface Tactical Team Trainer (STTT)*	

	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	106.880	12.145		15.274		42.046		-		42.046	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

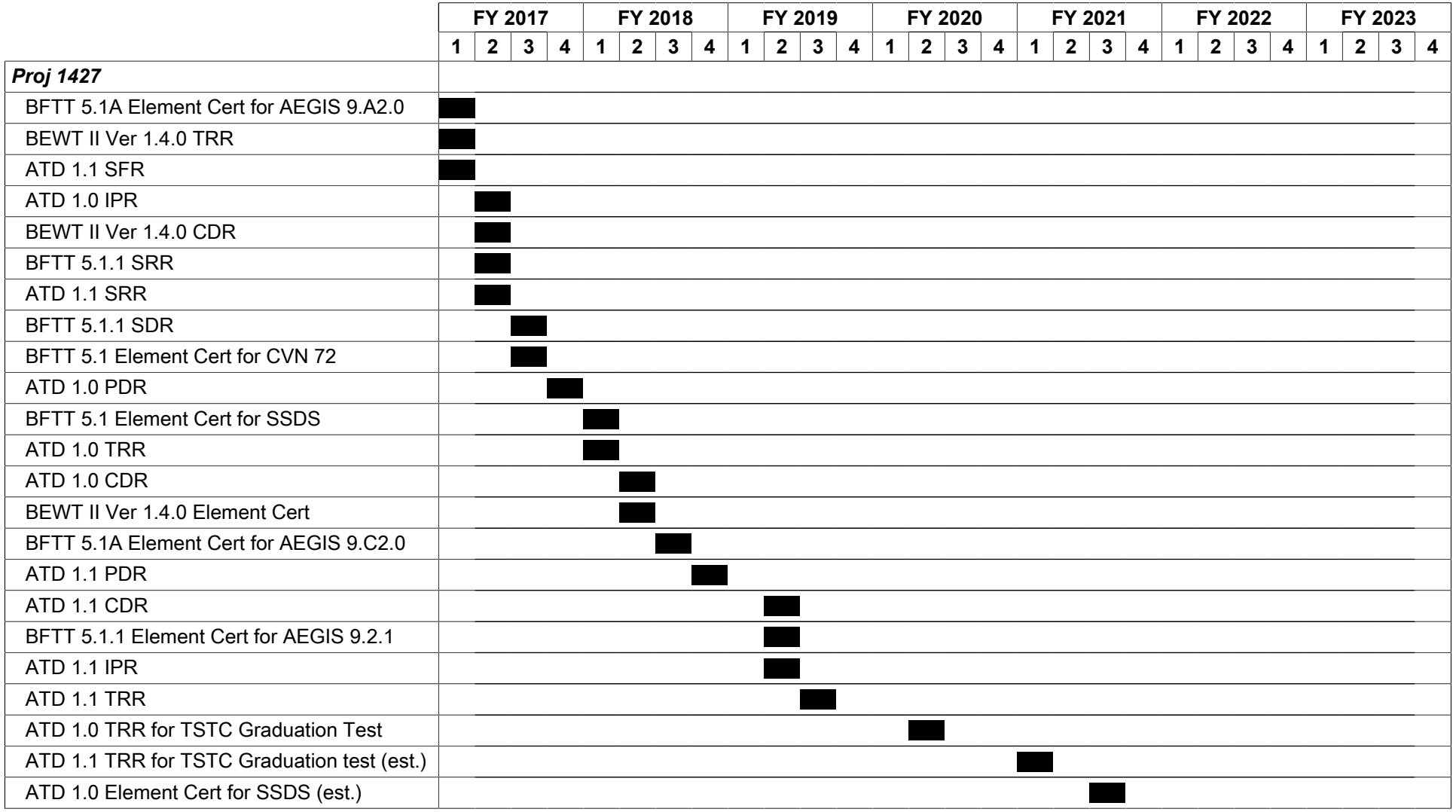


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1427				
BFTT 5.1A Element Cert for AEGIS 9.A2.0	1	2017	1	2017
BEWT II Ver 1.4.0 TRR	1	2017	1	2017
ATD 1.1 SFR	1	2017	1	2017
ATD 1.0 IPR	2	2017	2	2017
BEWT II Ver 1.4.0 CDR	2	2017	2	2017
BFTT 5.1.1 SRR	2	2017	2	2017
ATD 1.1 SRR	2	2017	2	2017
BFTT 5.1.1 SDR	3	2017	3	2017
BFTT 5.1 Element Cert for CVN 72	3	2017	3	2017
ATD 1.0 PDR	4	2017	4	2017
BFTT 5.1 Element Cert for SSDS	1	2018	1	2018
ATD 1.0 TRR	1	2018	1	2018
ATD 1.0 CDR	2	2018	2	2018
BEWT II Ver 1.4.0 Element Cert	2	2018	2	2018
BFTT 5.1A Element Cert for AEGIS 9.C2.0	3	2018	3	2018
ATD 1.1 PDR	4	2018	4	2018
ATD 1.1 CDR	2	2019	2	2019
BFTT 5.1.1 Element Cert for AEGIS 9.2.1	2	2019	2	2019
ATD 1.1 IPR	2	2019	2	2019
ATD 1.1 TRR	3	2019	3	2019
ATD 1.0 TRR for TSTC Graduation Test	2	2020	2	2020
ATD 1.1 TRR for TSTC Graduation test (est.)	1	2021	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 1427 / *Surface Tactical Team Trainer (STTT)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ATD 1.0 Element Cert for SSDS (est.)	3	2021	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 2124 / *Air Warfare Training*	

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
2124: *Air Warfare Training*	48.078	1.438	1.585	1.709	-	1.709	1.710	1.634	1.665	1.699	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project transitions new training and range system technologies for use in Naval Aviation training. Products from this effort are directly tied to the Navy Aviation Simulation Master Plan (NASMP), MH-60R/S master plan, Unmanned Aerial Systems (UAS) master plan, the Live Virtual Constructive (LVC) program, component technologies, including the Multiplex Data Bus Controller Translator Transmitter, F/A-18C-F Requirements Procurement Plan (RPP), open architecture implementation, multiple technology refresh efforts and the Multi-Mission Maritime Aircraft/P-8 programs. These efforts will support training optimization of future naval aviation training/preview/mission rehearsal systems (fixed, deployed, and unmanned). Tasks include: specification development to provide for common, modular, High Level Architecture compliant, high fidelity Distributed Mission Training and mission rehearsal capabilites ashore and afloat. Technologies to be developed and integrated include: intelligent semi-automated forces (SAF) technologies, automated performance measurement technology, advanced net-ready weapons simulation, Air to Air/ Air to Ground, visual/sensor enhancement, sensor/weather server, common post mission assessment technologies, tablet mission preview technology, advanced visual-sensor technology, high resolution helmet mounted, and/or flat panel displays, 20-20 visual acuity image generation, NAVAIR Portable Source Initiative improvements, common correlated data set technologies, common link, common software/database reuse technologies, advanced environmental effects modeling, fused radar/infra-red/electro-optic and acoustic sensor simulations, aerodynamic modeling, physics-based infra-red simulations, spatial disorientation research, comms degradation modeling, and final Test and Evaluation (T&E) within the Aviation Training Technology Integration Facility (ATTIF), Naval Air Warfare Center-Aircraft Division. This Manned-Flight Simulator (MFS) ATTIF capability provides a window to fleet aviators for critical comment, evaluation and fine tuning of new, interoperable, and innovative technologies such as LVC before final transition to the fleet. Naval Aviation Distributed Training Center, debrief/After Action Review (AAR), and intelligent training tools for the virtual environment are focused on human performance and trend analysis enhancements for fleet readiness and distributed mission training at all levels.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: HUMAN/INSTRUCTIONAL SYSTEMS INTEGRATION	0.646	0.732	0.959	0.000	0.959
Articles:	-	-	-	-	-
Description: Develop common After Action Review (AAR) and platform-unique post mission assessment, Intelligent Tactical SAF, and high fidelity simulator component technologies. After Action Review (AAR), and high fidelity components such as Intelligent SAF designs lower Navy Aviation Simulation Master Plan (NASMP) upgrade and simulator life-cycle costs. Integrate Voice-Capable semi-automated forces (SAF) component technologies, improve open common instructor interface effectiveness and provide for multi-SAF exercise utilization. Analyze, develop, and integrate common architecture components for F/A-18C-F, EA-18G, MH-60R/S, Unmanned Aerial Systems (UAS) platforms, E-2C/D & United States Marine Corps mission areas, intelligent instructor operator components, automated performance measurement technologies, Tactical Aircraft/ Multi-Mission Maritime Aircraft/ Reduced Oxygen Breathing Device-Spatial Disorientation technologies/devices					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
common graphic user interface initiatives, common threat system formats, Next Generation Threat System (NGTS) technology transitions, Joint Semi-Automated Forced (JSAF) compatibility, cross platform post mission performance measurement, Multi-purpose Reconfigurable Maintenance Training Systems, (MRTS) and after action review/debrief innovations, thereby maximizing return on investment for instructional systems technology investments. ***FY 2018 Plans:*** Continue fidelity improvements for synthetic entity systems (e.g. NGTS, JSAF), including realistic blue force collaborative behavior and improved support for debrief in distributed training environments. Support test and evaluation of alternate solutions for mask-on hypoxia training. Continue Post Mission Assessment for Tactical Training (PMATT) with emphasis on automated scoring of live training events in fixed and rotary wing aircraft. Investigate strategies for efficient cross-platform after action review and debrief in distributed training settings. Perform Advanced Development Simulations (ADS) component enhancements and Technology Readiness Assessments in relevant environments. ***FY 2019 Base Plans:*** Continue improvements for synthetic entity systems (e.g. NGTS, JSAF), including virtual crewman and wingman capability and speech recognition control. Continue test and evaluation of alternate mask-on hypoxia training device. Develop automated scoring and debrief technology for use in multi-team, distributed, and Live, Virtual and Constructive (LVC) training environments. Continue development of the Post Mission Assessment for Tactical Training (PMATT) for rotary wing and multiplatform environments. Perform training effectiveness experiments on low footprint, virtual reality based simulators. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase in funding from FY18 to FY19 is required to support the following projects: Develop F-18 Virtual Wingman for integration into Next Generation Threat System (NGTS); Conduct test and evaluation of On-Demand Hypoxia Training (ODHT) device in order to (1) assess impact of variable oxygen concentration on recovery rates, (2) assess variable flow rates on efficacy of system to induce hypoxia for training purposes, and (3) validate that device improves training outcomes as compared to current Reduced Oxygen Breathing Device (ROBD) trainer; Develop Post Mission Assessment for Tactical Training (PMATT) capability for H-60 and F/A-18.					
Title: SENSORS AND ENVIRONMENT	0.487	0.525	0.250	0.000	0.250

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

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: Develop common and platform unique sensor, visual, and environmental simulation (atmospherics or acoustics) into fidelity upgrades with Commercial Off The Shelf and/or Government Off the Shelf (GOTS) Software. Perform risk reduction, advanced displays innovation, test and evaluation, integration, and production of Common Sensor Model, High Fidelity Active-Acoustics Sensor Operator Training, 3D Ocean effects, Anti-Submarine Warfare (ASW) acoustic fidelity assessments, 3D weather effects, 3D Ocean acoustic modeling, new Reduced Oxygen Breathing Device (ROBD)& Spatial Disorientation (SD), and legacy device technologies. Demonstrate GOTS capability for cost-effective database materialization, Material Properties Reference Dataset library, associated NAVAIR Portable Source Initiative specifications and processes for implementation on Distributed Mission Training, deployed trainers, legacy, and new visual system upgrade programs. In support of Navy Aviation Simulation Master Plan (NASMP) upgrade efforts, develop texture storage, sensor-environmental effects, NAVAIR Portable Source Initiative material reference processes/standards, automated technology applications for real time publishing, shadows, cultural lighting, combat, and weather effects and very high resolution visualization technologies, to include tablet-based mission preview for tactical aircrew.

FY 2018 Plans:
Develop and test prototype augmented reality based alternate to F/A-18 Tactical Operational Flight Trainer (TOFT) visual system. Continue research on use of consumer-grade image generation engines to deliver Navy Aviation Simulator Master Plan quality visuals. Conduct experiments to test limits of collaborative environmental databases to provide time-critical terrain updates for deployable mission rehearsal trainers. Support development of enhanced environmental effects for Naval Aviation Survival Training Program's Virtual Reality Parachute Descent Trainer.

FY 2019 Base Plans:
Continue investigation of collaborative environmental database for time-critical terrain updates for deployable mission rehearsal trainers. Develop Near Eye Display (NED) Metrology system for verifying the performance of Virtual and Augmented Reality goggle displays. Develop and test metrics and procedures for equating the performance of virtual and augmented reality display systems to legacy Navy Aviation Simulation Master Plan (NASMP) display systems.

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 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Reduction between FY 2018 and FY 2019 to allow support of activities planned for Human / Instructional Systems Integration and Live, Virtual, and Constructive (LVC), and Visuals.					
Title: LIVE VIRTUAL CONSTRUCTIVE (LVC), AND VISUALS	0.305	0.328	0.500	0.000	0.500
Articles:	-	-	-	-	-
Description: Air Warfare Training Development provides for risk mitigation and next generation platform, Unmanned Aerial Systems, Live Virtual Constructive (LVC) and associated visualization component development for Navy aviation distributed mission training, and distributed training centers (NADTC), as well as for stand-alone and small footprint deployable devices. Provided integrated capability assessment for Ranges, Experimentation products, and Training. Support the NASMP upgrade efforts and Type/Model/Series programs with advanced visual system display configurations requirements. Assess trainee cognitive requirements and the development and incorporation of next generation Live Virtual Constructive (LVC), Unmanned Aerial Systems (UAS) constructive and associated debrief/After Action Review (AAR) visualization component technologies. Additionally, Air Warfare Training Development (AWTD) provides for advanced virtual component fidelity improvements for Live Virtual Constructive capability (such as "Mobility" Part-Task Trainers and the Multiplex Data Bus Controller Translator Transmitter (MDBCTT)). LVC technologies will facilitate advanced, cost effective weapons and tactics training and emerging capability requirements in the Air-Sea battlespace and Naval Integrated Fire Control-Counter Air (NIFC-CA) capabilities development.					
FY 2018 Plans: Provide analytical and developmental support for emergent programs of record in LVC, acoustic simulation environments, Warfighter performance assessment, threat system enhancements, Virtual Reality (VR), and sensor/visualization modeling. Provide man-in-the-loop /Technology Readiness Level (TRL) assessments at Manned Flight Simulator (MFS), and assess Distributed Mission Readiness Trainer (DMRT) family of systems, and other mobility-focused training devices for improved fleet training, Training and Readiness (T&R) metrics, and life-cycle cost reductions.					
FY 2019 Base Plans: Continue analytical and developmental support for emergent programs of record in Live, Virtual and Constructive (LVC), acoustic simulation environments, warfighter performance assessment, threat system enhancements, and sensor/visualization modeling. Develop integrated expandable flight deck crew trainer based on Commercial Off the Shelf (COTS) virtual and augmented reality technology. Deliver a prototype virtual reality					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Landing Signal Officer (LSO) Station for the expandable flight deck crew trainer. Investigate use of virtual reality to provide low cost simulation training for undergraduate rotary wing aviators. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase in funding from FY18 to FY19 is required to support the following projects: Training evaluation of TH-57 Virtual Reality (VR) Part Task Trainer (PTT) intended to support low level flight familiarization and course rules training; Training evaluation of T-45 Augmented Reality / Virtual Reality (AR / VR) Operational Flight Trainer (OFT) to inform decision about training download from aircraft and / or T-45 dome-based Tactical Operational Flight Trainer (TOFT); Develop warfighter performance assessment capability for transition to Fallon Integrated Training Facility (ITF); Develop and evaluate Virtual Reality trainer for flight deck crew positions (e.g., Landing Signal Officer).					
Accomplishments/Planned Programs Subtotals	1.438	1.585	1.709	0.000	1.709

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/0705:: *COMMON GROUND EQUIPMENT - TRAINING*	167.716	192.149	191.786	-	191.786	210.719	181.965	178.077	190.284	Continuing	Continuing

Remarks

D. Acquisition Strategy

Air Warfare Training Development (AWTD) is a BA 07 RDT&E joint technology transition program tied to Navy Aviation Simulation Master Plan (NASMP), United States Marine Corps upgrades and the various platform simulation master plans with the purpose of transitioning advanced training and mission preview/rehearsal technologies. AWTD provides risk mitigation, test and evaluation, and prototype development for stand-alone, manned, un-manned, distributed, open systems and deployed training systems for the warfighter utilizing an Integrated Product Team approach and a combination of reimbursable and direct cite/cost-plus time and material (T&M) contracts.

E. Performance Metrics

Naval Air Warfare Center-Training Systems Division (NAWC-TSD): # of transitions to Fleet Platforms. For each transition, successful Technical Readiness Level (TRL) testing and device Ready for Training (RFT) to Fleet platforms. Seminal transition events are either RFT or tech-refresh Authority to Operate.

NAWC-Aircraft Division (AD): Complete TRL & compliance testing for Navy Aviation Simulation Master Plan (NASMP) and Information Assurance directives.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

Aptima, Inc.: Government acceptance of evaluation of Small Business Innovation Research (SBIR) device testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 2124 / *Air Warfare Training*	

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	Bohemia Interactive : ORLANDO, FL	0.324	0.000		0.450	Jan 2018	0.277	Mar 2019	-		0.277	0.000	1.051	1.051
Software Development	C/CPFF	Aptima : WOBURN, MA	0.424	0.000		0.000		0.232	Mar 2019	-		0.232	0.000	0.656	0.656
Software Development	WR	NAWCTSD : ORLANDO, FL	23.141	1.038	Dec 2016	0.414	Nov 2017	0.549	Nov 2018	-		0.549	Continuing	Continuing	Continuing
Software Development	WR	NAMRU : SILVER SPRINGS, MD	0.085	0.005	Jun 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Prod Dev No Longer Funded in the Budget or Out Years	Various	Various : Various	10.532	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	34.506	1.043		0.864		1.058		-		1.058	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
Logistics	WR	NAWCAD : PATUXENT RIVER, MD	0.000	0.051	Dec 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Logistics	WR	NAWCTSD : ORLANDO, FL	0.000	0.000		0.052	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : PATUXENT RIVER, MD	0.000	0.033	Dec 2016	0.139	Nov 2017	0.120	Nov 2018	-		0.120	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCTSD : ORLANDO, FL	0.000	0.000		0.127	Nov 2017	0.150	Nov 2018	-		0.150	Continuing	Continuing	Continuing
Prior Year Support No Longer Funded in the Budget or Out Years	Various	Various : Various	3.803	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	3.803	0.084		0.318		0.270		-		0.270	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 2124 / *Air Warfare Training*	

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 AD : PAX RIVER, MD	7.525	0.063	Dec 2016	0.000		0.060	Nov 2018	-		0.060	Continuing	Continuing	Continuing
		Subtotal	7.525	0.063		0.000		0.060		-		0.060	Continuing	Continuing	N/A

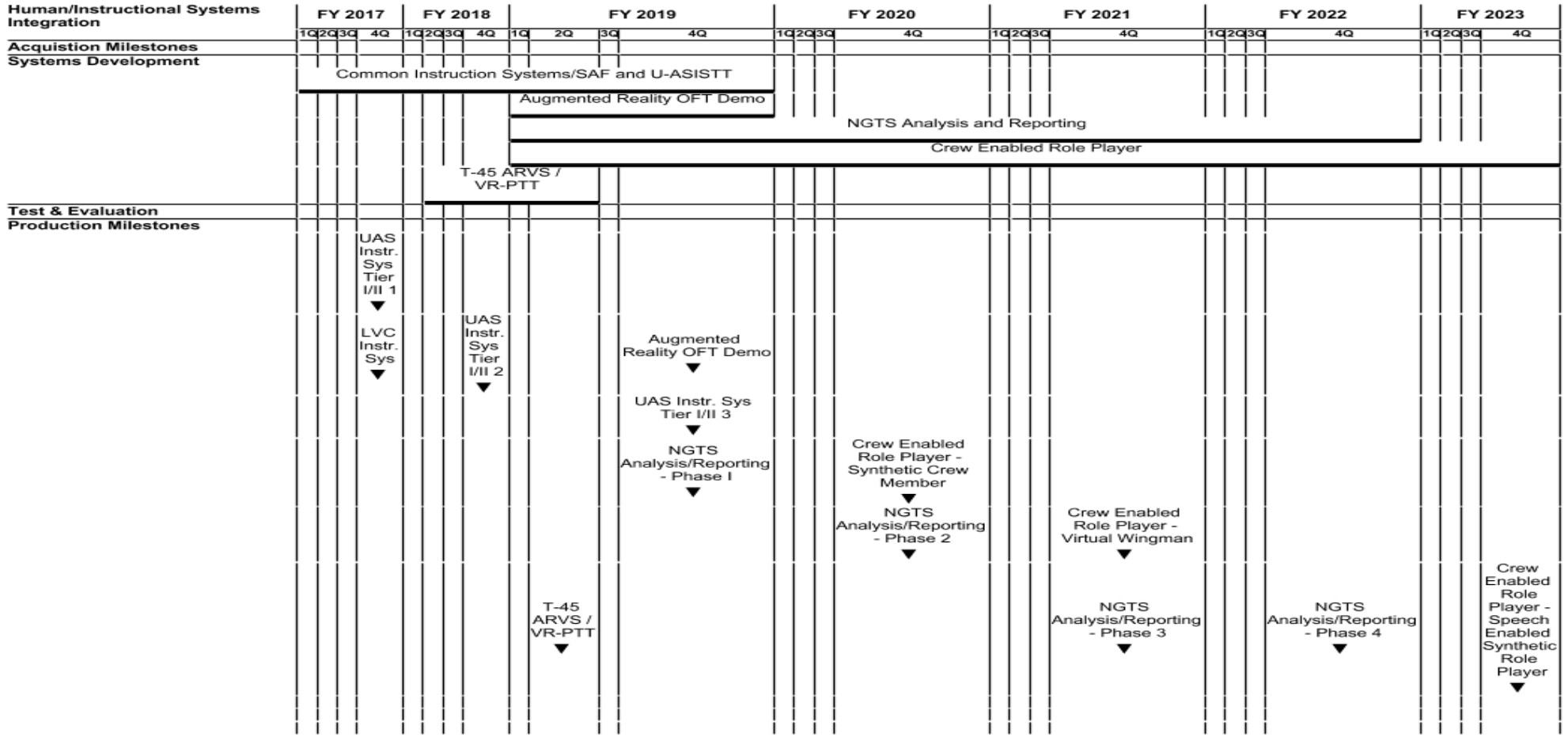
Management Services ($ in Millions)

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	Precise : LEXINGTON PARK, MD	0.248	0.150	Feb 2017	0.149	Feb 2018	0.134	Feb 2019	-		0.134	0.000	0.681	0.681
Program Management Support	WR	NAWC AD : PAX RIVER, MD	0.000	0.000		0.234	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Travel	Allot	NAVAIR : PAX RIVER, MD	0.534	0.009	Nov 2016	0.020	Nov 2017	0.010	Nov 2018	-		0.010	Continuing	Continuing	Continuing
Program Management Support	WR	NAWCTSD : ORLANDO, FL	0.000	0.089	Nov 2016	0.000		0.177	Nov 2018	-		0.177	Continuing	Continuing	Continuing
Prior year Mgmt Sup no longer funded in the FYDP	Various	Various : Various	1.462	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	2.244	0.248		0.403		0.321		-		0.321	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	48.078	1.438		1.585		1.709		-		1.709	Continuing	Continuing	N/A

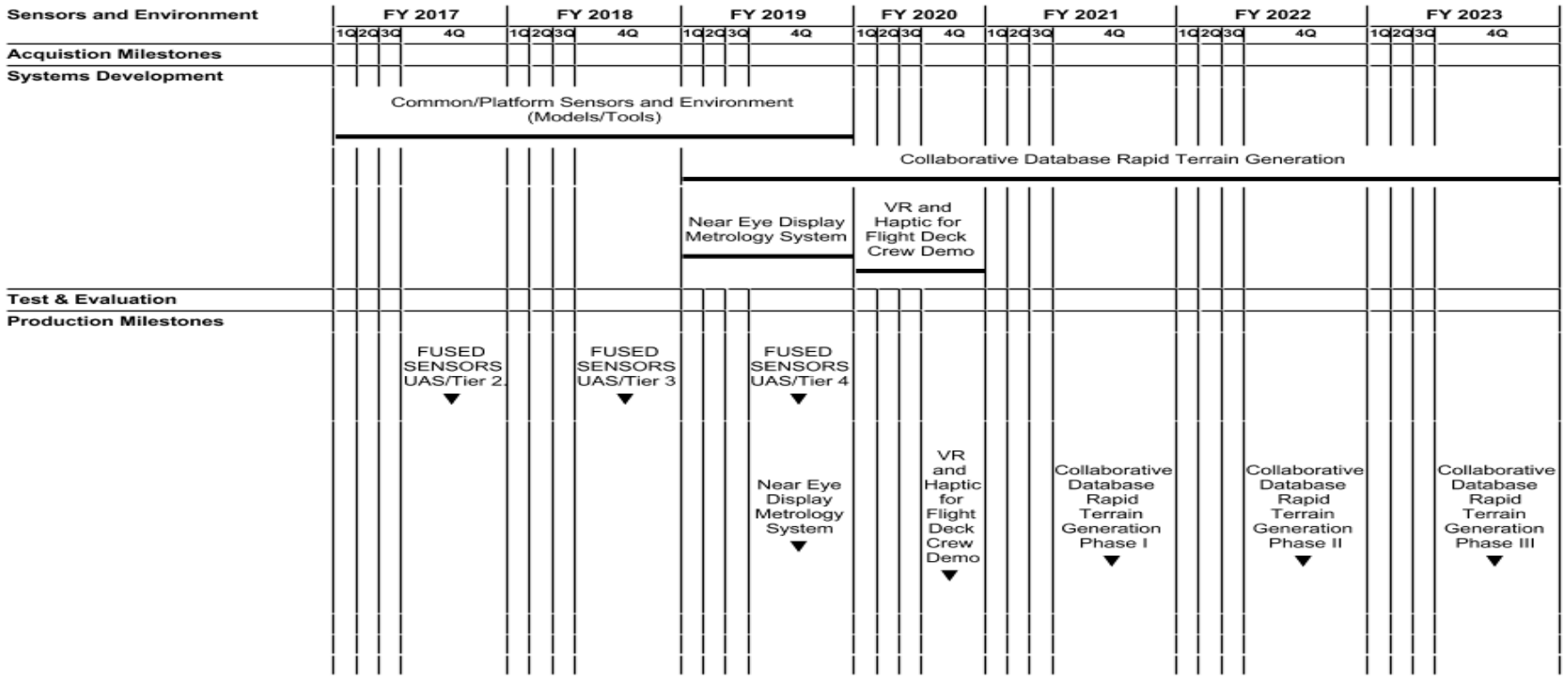
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*



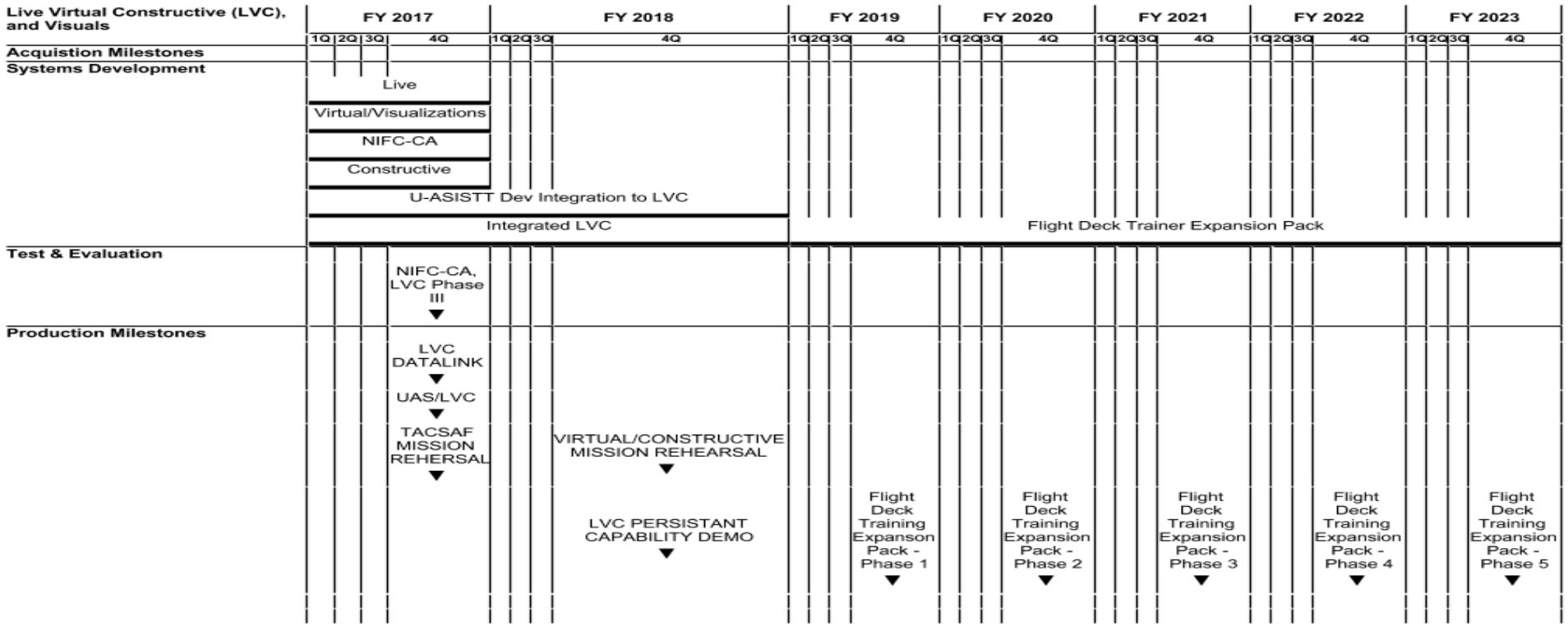
2019PB - 0204571N - 2124

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*



2019PB - 0204571N - 2124

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*



2019PB - 0204571N - 2124

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Human/Instructional Systems Integration				
Systems Development: Common Instruction Systems/SAF and Unmanned Aerial Systems Interface Selection and Training Tech Dev	1	2017	4	2019
Systems Development: Augmented Reality OFT Demo	1	2019	4	2019
Systems Development: NGTS Analysis and Reporting	1	2019	4	2022
Systems Development: Crew Enabled Role Player	1	2019	4	2023
Systems Development: T-45 Augmented Reality Visual System (ARVS) Part Task Trainer (PTT)	2	2018	2	2019
Production Milestones: UAS INSTR. SYS Tier I/II 1	4	2017	4	2017
Production Milestones: LVC INSTR SYS Component Technologies	4	2017	4	2017
Production Milestones: Augmented Reality OFT Demo	4	2019	4	2019
Production Milestones: UAS INSTR. SYS Tier I/II 2	4	2018	4	2018
Production Milestones: UAS INSTR. SYS. Tier I/II 3	4	2019	4	2019
Production Milestones: NGTS Analysis and Reporting - Phase I	4	2019	4	2019
Production Milestones: Crew Enabled Role Player - Synthetic Crew Member	4	2020	4	2020
Production Milestones: NGTS Analysis and Reporting - Phase 2	4	2020	4	2020
Production Milestones: Crew Enabled Role Player - Virtual Wingman	4	2021	4	2021
Production Milestones: NGTS Analysis and Reporting - Phase 3	4	2021	4	2021
Production Milestones: NGTS Analysis and Reporting - Phase 4	4	2022	4	2022
Production Milestones: Crew Enabled Role Player - Speech Enabled Synthetic Role Player	4	2023	4	2023
Production Milestones: T-45 Augmented Reality Visual System (ARVS) Part Task Trainer (PTT)	2	2019	2	2019
Sensors and Environment				

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Common/Platform Sensors and Environment (Models/Tools)	1	2017	4	2019
Systems Development: Collaborative Database Rapid Terrain Generation	1	2019	4	2023
Systems Development: Near Eye Display Metrology System	1	2019	4	2019
Systems Development: VR and Haptic for Flight Deck Crew Demo	1	2020	4	2020
Production Milestones: FUSED SENSORS UAS/Tier 2	4	2017	4	2017
Production Milestones: FUSED SENSORS UAS/Tier 3	4	2018	4	2018
Production Milestones: FUSED SENSORS UAS/Tier 4	4	2019	4	2019
Production Milestones: Near Eye Display Metrology System	4	2019	4	2019
Production Milestones: VR and Haptic for Flight Deck Crew Demo	4	2020	4	2020
Production Milestones: Collaborative Database Rapid Terrain Generation Phase I	4	2021	4	2021
Production Milestones: Collaborative Database Rapid Terrain Generation Phase II	4	2022	4	2022
Production Milestones: Collaborative Database Rapid Terrain Generation Phase III	4	2023	4	2023
Live Virtual Constructive (LVC), and Visuals				
Systems Development: Live	1	2017	4	2017
Systems Development: Virtual/SAF Visualizations	1	2017	4	2017
Systems Development: NIFC-CA FEA	1	2017	4	2017
Systems Development: Constructive	1	2017	4	2017
Systems Development: Unmanned Aerial Systems Interface Selection and Training Tech Dev Integration to LVC	1	2017	4	2018
Systems Development: Integrated LVC Components	1	2017	4	2018
Systems Development: Flight Deck Trainer Expansion Pack	1	2019	4	2023
Test & Evaluation: NIFC-CA, LVC, Fallon, Phase III	4	2017	4	2017
Production Milestones: LVC DATALINK	4	2017	4	2017
Production Milestones: UAS/LVC Component Technologies	4	2017	4	2017
Production Milestones: TACSAF MISSION REHERSAL	4	2017	4	2017
Production Milestones: VIRTUAL / CONSTRUCTIVE MISSION REHEARSAL	4	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 2124 / *Air Warfare Training*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: LVC PERSISTANT CAPABILITY DEMO	4	2018	4	2018
Production Milestones: Flight Deck Training Expanson Pack - Phase 1	4	2019	4	2019
Production Milestones: Flight Deck Training Expansion Pack - Phase 2	4	2020	4	2020
Production Milestones: Flight Deck Training Expansion Pack - Phase 3	4	2021	4	2021
Production Milestones: Flight Deck Training Expansion Pack - Phase 4	4	2022	4	2022
Production Milestones: Flight Deck Training Expansion Pack - Phase 5	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3093 / *TACTS/LATR 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
3093: *TACTS/LATR Replacement*	81.126	12.444	48.473	56.154	-	56.154	35.307	6.773	3.809	3.899	Continuing	Continuing
Quantity of RDT&E Articles		-	41	16	-	16	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Combat Training System (TCTS) Increment II will provide an improved environment for air combat training utilizing a secure air-to-air and air-to-ground data link, and will provide rangeless operation capability to Forward Deployed Naval Forces (FDNF). TCTS Increment II will provide encryption and an enhanced threat environment, as well as airborne participant instrumentation for multiple fixed and rotary wing platforms. Engineering Development Models (EDM) units procured in FY18 (41) and FY19 (16) will support Engineering and Developmental Testing events thru FY20. The EDMs will be specifically utilized for testing in the following areas: Environmental Qualification, Software, High Accelerated Lifecycle, Ground System Integration, Airborne Subsystem Air Worthiness and Performance, Shipboard Ground Station, Internal Mount and Rack Mounted Subsystem (Internal Mount) Airworthiness and Performance and JSF Airworthiness and Performance. FY19 funding supports both multiple government and contractor development efforts, as well as, procurement of the EDMs. These efforts support a Milestone C of 1Q FY20 and a Fleet IOC need date of 2Q FY21 in order to address critical OPSEC concerns.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: TACTS/LATR REPLACEMENT	12.444	48.473	56.154	0.000	56.154
Articles:	-	41	16	-	16
Description: TCTS: Qualify and complete the Rangeless Pod system fielding for Carrier Air Wing Five (CVW-5) CVN installation, including the complete Integrated Logistics products and training. Define Test & Training Enabling Achitecture (TENA) compliant interface between TCTS and an Advance Display System (ADS). Develop a Rack-Mounted subsystem for use on rotary wing and transport aircraft. Continue development of the encrypted data link. Develop related training range integration.					
FY 2018 Plans: FY18 represents a full year of engineering, manufacturing and development (EMD) for the program that justifies the current control. FY18 funding supports Preliminary Design Review (PDR), Critical Design Review (CDR), Systems Engineering Technical Review (SETR) events and post PDR assessments with the Milestone Decision Authority (MDA). This also includes Engineering Development Model (EDM) fabrication and deliveries of both participant subsystems and ground stations to support Developmental Testing (DT) testing beginning in FY19.					
FY 2019 Base Plans: FY19 will include the completion of Critical Design Review (CDR), Post Critical Design Review (CDR) assessment, and Engineering reviews to include a Test Readiness Review (TRR), Flight Readiness Review					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
(FRR) and Functional Configuration Audit (FCA) to assess contractor progress in delivering an encryption system that meets the system operating requirements. These reviews will ensure readiness to start contractor system testing and follow-on government subsystem testing. The Engineering Development Models (EDM) will start delivery to support the initiation of Contractor and Government Test and Evaluation testing. FY19 will include the completion of National Security Agency (NSA) Certification to support test and receive System Authority to Operate (ATO). 16 test articles will be procured to include 6 Rack-Mounted Subsystems and 10 Remote Range Units. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $7.681M from FY 2018 to FY 2019 represents funding required to conduct Post Preliminary and Critical Design Review assessments and Engineering reviews to include a Test Readiness Review (TRR), Flight Readiness Review (FRR) and Functional Configuration Audit (FCA) to assess contractor progress in delivering an encryption system that meets the system operating requirements.					
Accomplishments/Planned Programs Subtotals	12.444	48.473	56.154	0.000	56.154

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/4204: *Weapons Range Support Equipment (WRSE)*	58.116	72.110	93.864	-	93.864	85.269	73.794	99.618	103.549	Continuing	Continuing
• APN/0725: *Other Production Charges/Tactical Combat Training System (TCTS)*	0.860	1.463	1.444	-	1.444	13.891	21.189	21.611	22.066	Continuing	Continuing

Remarks

D. Acquisition Strategy

Tactical Combat Training System will employ an evolutionary incremental acquisition strategy. This strategy will provide for the development of a system that meets the Operational Requirements Document.

E. Performance Metrics

Rockwell Collins, Inc.: National Security Agency (NSA) approved encrypted Data Link Transceiver (DLT). Successful Engineering Development Model testing of encrypted DLT requirements with NSA.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3093 / *TACTS/LATR 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
Hardware Development	C/CPIF	ROCKWELL COLLINS, INC : CEDAR RAPIDS, IA	9.144	8.318	Mar 2017	42.114	Oct 2017	50.950	Oct 2018	-		50.950	31.474	142.000	142.000
Prior Year Prod Dev No Longer Funded in the Budget or Out Years	Various	Various : Various	10.901	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	20.045	8.318		42.114		50.950		-		50.950	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	NAWC-WD : CHINA LAKE, CA	0.862	0.099	Mar 2017	0.130	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWC-AD : PAX RIVER, MD	8.543	0.955	Jan 2017	2.693	Jan 2018	3.408	Nov 2018	-		3.408	Continuing	Continuing	Continuing
Logistics	WR	NAWC-AD : PAX RIVER, MD	0.279	0.435	Jan 2017	0.460	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Logistics Sup	C/CPFF	Synectic Solutions, Inc. : LEXINGTON PARK, MD	0.000	0.164	Aug 2017	0.130	Aug 2018	0.000		-		0.000	0.000	0.294	0.294
Prior Year Support No Longer Funded in the Budget or Out Years	Various	Various : Various	28.115	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	37.799	1.653		3.413		3.408		-		3.408	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	NAWC-AD : PAX RIVER, MD	1.501	0.437	Jan 2017	0.824	Jan 2018	0.588	Nov 2018	-		0.588	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3093 / *TACTS/LATR Replacement*	

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 the Budget or Out Years	Various	Various : Various	3.425	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	4.926	0.437		0.824		0.588		-		0.588	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
Prog Mgnt Sup	WR	NAWC-AD : PAX RIVER, MD	2.199	1.952	Jan 2017	2.032	Jan 2018	1.181	Nov 2018	-		1.181	Continuing	Continuing	Continuing
Travel	Allot	NAVAIR : PAX RIVER, MD	0.098	0.005	Jan 2017	0.010	Jan 2018	0.027	Nov 2018	-		0.027	Continuing	Continuing	Continuing
Prog Mgnt Sup	C/CPFF	Precise : LEXINGTON PARK, MD	0.000	0.079	Dec 2016	0.080	Feb 2018	0.000		-		0.000	0.000	0.159	0.159
Prior Year Mgmt No Longer Funded in the Budget or Out Years	Various	Various : Various	16.059	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	18.356	2.036		2.122		1.208		-		1.208	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	81.126	12.444		48.473		56.154		-		56.154	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

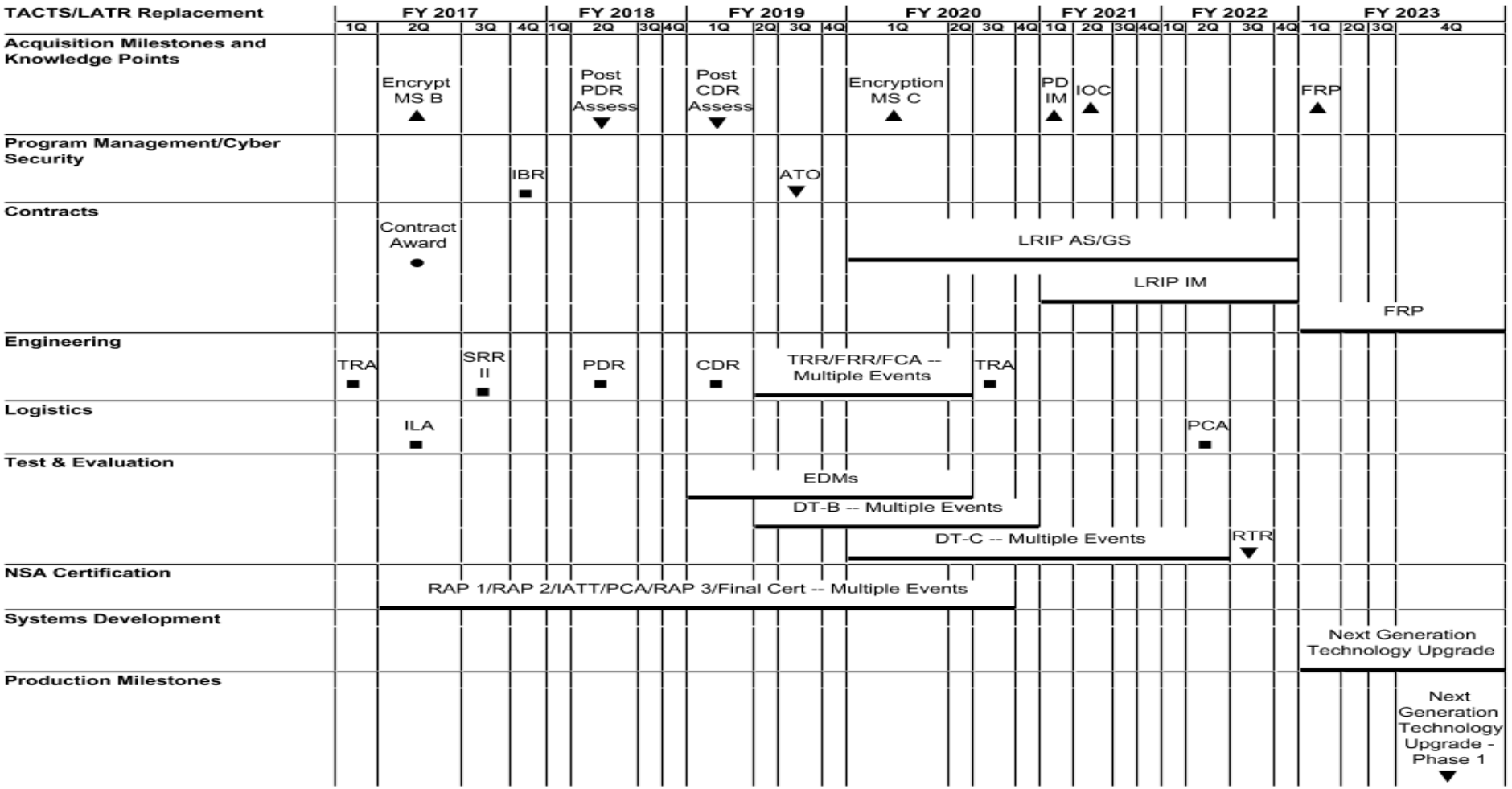


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

2019PB - 0204571N - 3093

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TACTS/LATR Replacement				
Acquisition Milestones and Knowledge Points: Encryption MS B	2	2017	2	2017
Acquisition Milestones and Knowledge Points: Post PDR Assessment	2	2018	2	2018
Acquisition Milestones and Knowledge Points: Post CDR Assessment	1	2019	1	2019
Acquisition Milestones and Knowledge Points: Encryption MS C	1	2020	1	2020
Acquisition Milestones and Knowledge Points: IOC	2	2021	2	2021
Acquisition Milestones and Knowledge Points: Production Decision Internal Mount	1	2021	1	2021
Acquisition Milestones and Knowledge Points: FRP	1	2023	1	2023
Program Management/Cyber Security: Integrated Baseline Review	4	2017	4	2017
Program Management/Cyber Security: Authority to Operate	3	2019	3	2019
Contracts: Contract Award	2	2017	2	2017
Contracts: LRIP Airborne Subsystem (POD), Ground Subsystem, Remote Range Unit, Portable Support Equipment Subsystem	1	2020	4	2022
Contracts: LRIP Rack-Mounted Internal Mount, JSF Internal Mount	1	2021	4	2022
Contracts: Full Rate Production	1	2023	4	2023
Engineering: Technology Readiness Assessment I	1	2017	1	2017
Engineering: System Requirements Review II	3	2017	3	2017
Engineering: Preliminary Design Review	2	2018	2	2018
Engineering: Critical Design Review	1	2019	1	2019
Engineering: Test Readiness Review / Flight Readiness Review / Functional Configuration Audit	2	2019	2	2020
Engineering: Technology Readiness Assessment II	3	2020	3	2020
Logistics: Integrated Logistics Review	2	2017	2	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3093 / *TACTS/LATR Replacement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Logistics: Physical Configuration Audit	2	2022	2	2022
Test & Evaluation: Engineering Development Models	1	2019	2	2020
Test & Evaluation: Developmental Test B - Multiple Events	2	2019	4	2020
Test & Evaluation: Developmental Test C - Multiple Events	1	2020	2	2022
Test & Evaluation: Report of Test Results	3	2022	3	2022
NSA Certification: RAP 1/RAP 2/IATT/PCA/RAP 3/Final Cert	2	2017	3	2020
Systems Development: Next Generation Technology Upgrade	1	2023	4	2023
Production Milestones: Next Generation Technology Upgrade Phase 1	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3356 / *High Fidelity Surface Trainers*	

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
3356: *High Fidelity Surface Trainers*	21.014	6.457	1.183	0.756	-	0.756	1.967	1.470	0.000	0.000	0.000	32.847
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This line funds high fidelity Aegis Integrated Air and Missile Defense (IAMD) individual, instructor, strike group and team trainers to support all Advanced Capability Build (ACB) and below Aegis baselines. This line provides funds for development of a High Fidelity Aegis Combined Integrated Air and Missile Defense (IAMD) and Anti-Submarine Warfare (ASW) Trainer (CIAT) to enable advanced warfare training (AWT) Phase II objectives to be accomplished ashore and to support Active and Passive Sonar Operations, Target Motion Analysis, Sonobuoy Localization, Command and Control, and execution of ASW Kill chain. Funds are provided for advanced component technology development, prototype evaluation, and technology readiness level assessment. Development of these trainers is in response to CNO Wholeness Review and Department of the Navy requirements. This line also provides funds for the research and development of advanced technologies to support Aegis Ballistic Missile Defense (BMD) builds and Command, Control, Communication, Computer, and Intelligence (C4I) advanced technology upgrades to Aegis BMD Ashore Team Trainer at the Center for Surface Combat Systems (CSCS) Unit Dam Neck. This line supports Surface Training Advanced Virtual Environment (STAVE) methodology by researching and developing trainers that will create an immersive and interactive learning environment and support both CNO High Velocity Learning and Ready Relevant Learning intent.

NOTE: In FY18, Mine Warfare Synthetic Training requirements previously captured within PE 0204571N / Proj 3356 (High Fidelity Surface Trainer) were realigned to PE 0603502N Surface & Shallow Water MCM / Proj 1235 (Mine Warfare Planning and Analysis).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Combined IAMD ASW Trainer (CIAT)	4.500	0.607	0.156	0.000	0.156
Articles:	-	-	-	-	-
FY 2018 Plans: Complete research and development spirals of all simulations and system architecture for the High Fidelity Combined IAMD & ASW Trainer (CIAT). Research and Develop Advanced technologies necessary to stimulate and emulate the AEGIS B/L 9 tactical system. Test and evaluate the developed solution to virtualize AEGIS legacy tactical code to be able to re-host the tactical software on COTS hardware. These solutions will support scenario driven watch team practice of standard operating procedures (SOPs), Tactical Techniques and Procedures (TTPs) and Pre-Planned Response (PPRs) against advanced threats in a realistic environment. Research and Develop technologies and interfaces which will enable ASW and Electronic Warfare (EW) trainers					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3356 / *High Fidelity Surface Trainers*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
to be integrated with IAMD training system for integrated training events. Test and Integrate developed models to allow for Navy Integrated Fire Control-Counter Air (NIFC-CA) training. ***FY 2019 Base Plans:*** Test and integrate developed models prior to system installation. Research and develop models to integrate into the system which would keep pace with emergent tactical capabilities in the Fleet such as Electronic Warfare and NIFC-CA enhancements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY18 to FY19 decrease is due to conclusion of Spiral 3 CIAT and conducting System Integration Testing (SIT) and Warfare Acceptance Testing (WAT) testing.					
Title: Aegis BMD Ashore and Aegis BMD Ship Training	1.957	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: Air Defense Strike Group Facility	0.000	0.576	0.600	0.000	0.600
Articles:	-	-	-	-	-
FY 2018 Plans: Research and develop two Virtual Aegis Combat System Simulators (VACSSim) to develop the Engineering Development Model for the Air Defense Strike Group Facility (ADSGF) shore-based air and surface simulation device in Fallon, NV. Research and develop advanced technologies to allow VACSSim improvements in support of surface equities incorporated in Aegis B/L upgrades. ***FY 2019 Base Plans:*** Research and develop VACSSim simulators and CEC Engagement Processor (CEP) Simulators to integrate within the Integrated Training Facility (ITF) Engineering Development Model (EDM). Additional functionality to VACSSim will be researched and developed to include additional AEGIS Baselines and submodes. These					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3356 / *High Fidelity Surface Trainers*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
simulators will integrate with NAVAIR simulators (E2D, F35) to create an overarching simulation environment that will be the only way to train Carrier Strike Groups on high-end threats and capabilities related to Naval Integrated Fire Control Counter Air (NIFC-CA). The ITF capabilities are a requirement of the NIFC-CA Flag Steering Committee and part of the CNO-directed Fleet Training Wholeness effort. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY18 to FY19 increase is due to more specialized engineering staff to complete FY19 deliverables. In FY19, ADSGF will begin development on the Virtual Aegis Combat Systems Simulation (VACSSIM) configuration for the Integrated Training Facility (ITF) and CEC Engagement Processor (CEP) Workstation configuration of the ITF.					
Accomplishments/Planned Programs Subtotals	6.457	1.183	0.756	0.000	0.756

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The software development for High Fidelity Surface Trainers is accounted for in this RDT&E line. The software development and introduction for the Aegis Ballistic Missile Defense (BMD) builds and C4I advanced technology upgrades to Aegis BMD Ashore Team Trainer is accounted for in this RDT&E line. These upgrades will provide an enabling technology to an existing training system.

E. Performance Metrics

Naval Surface Warfare Center Dahlgren: Approved Combined IAMD and ASW Trainer (CIAT). Successful engineering development model (EDM) introducing advanced technologies necessary to simulate/stimulate the AEGIS Combat System elements required for operators stated in AEGIS Ashore Baseline 9 Weapons Specification (WS) 21200 series.

Naval Surface Warfare Center Dahlgren: Incorporation of approved legacy Aegis baselines (7.2, 6.3) into the Virtual Aegis Combat System Simulator (VACSSim). Incorporation of additional sub-modes into the VACSSim. Successful integration of VACSSim and CEP Workstation into the Integrated Training Facility simulation architecture.

Naval Air Warfare Center Training Systems Division: Approved Aegis Ballistic Missile Defense (BMD) builds and C4I advanced technology upgrades to the Aegis BMD Ashore Team Trainer.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3356 / *High Fidelity Surface Trainers*

Naval Surface Warfare Center Carderock: Approved Combined IAMD & ASW Trainer (CIAT). Successful engineering development model introducing advanced technologies necessary to 1) simulate performance of AN/SQQ-89A(V)15 sonar system in alignment with fielding plan for initial Sonar software versions with capability to receive AN/SQQ-89A(V)15 coordinated routine modernizations and 2) replicate Combat Information Center (CIC) configuration and functionalities representative of AEGIS Baseline 9.

Naval Undersea Warfare Center Newport: Approved Combined IAMD & ASW Trainer (CIAT). Develop ASW components to be integrated in the CIAT system for Technology Requirements Model (TRM) simulation of own ship and threat torpedoes, and emulations of sonar devices.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 3356 / *High Fidelity Surface Trainers*	

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	WR	NSWC DAHLGREN : DAHLGREN,VA	14.088	3.151	Nov 2016	0.915	Nov 2017	0.206	Nov 2018	-		0.206	0.286	18.646	Continuing
SYSTEMS ENG	WR	NSWC CARDEROCK : CARDEROCK, MD	5.103	0.949	Nov 2016	0.268	Nov 2017	0.000		-		0.000	0.000	6.320	-
SYSTEMS ENG	WR	NUWC NEWPORT : NEWPORT, RI	1.676	0.400	Nov 2016	0.000		0.000		-		0.000	0.000	2.076	-
SYSTEMS ENG	MIPR	U.S. ARMY SMDC : HUNTSVILLE, AL	0.147	0.000		0.000		0.000		-		0.000	0.000	0.147	-
SYSTEMS ENG	WR	NAWCTSD : ORLANDO, FL	0.000	1.957	Jul 2017	0.000		0.000		-		0.000	0.000	1.957	-
SYSTEMS ENG	TBD	LOCKHEED MARTIN : TBD	0.000	0.000		0.000		0.550	Nov 2018	-		0.550	3.151	3.701	Continuing
		Subtotal	21.014	6.457		1.183		0.756		-		0.756	3.437	32.847	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	21.014	6.457		1.183		0.756		-		0.756	3.437	32.847	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3356 / *High Fidelity Surface Trainers*

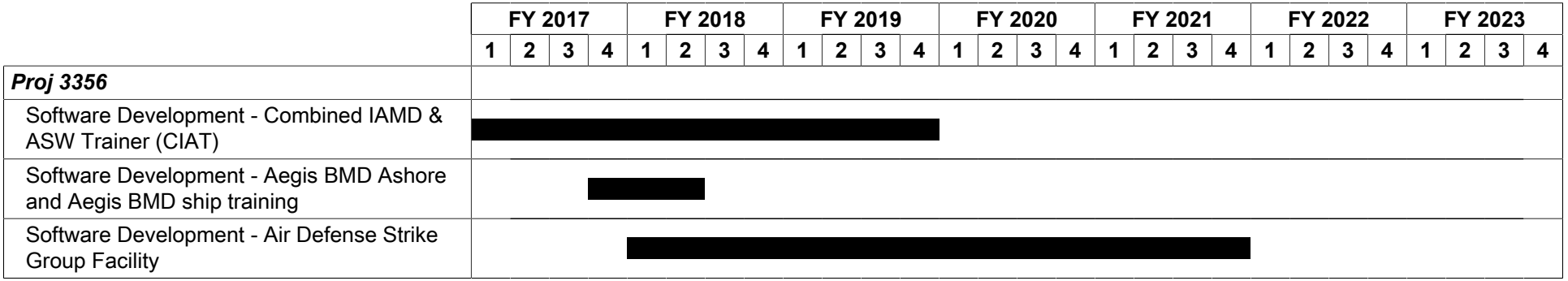


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 3356 / *High Fidelity Surface Trainers*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3356				
Software Development - Combined IAMD & ASW Trainer (CIAT)	1	2017	4	2019
Software Development - Aegis BMD Ashore and Aegis BMD ship training	4	2017	2	2018
Software Development - Air Defense Strike Group Facility	1	2018	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	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	8.704	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.704
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The Barking Sands Tactical Underwater Range (BARSTUR) is a critical Pacific Missile Range Facility (PMRF) undersea training range that was installed in FY94 and is well beyond its service life. Funding is provided to accelerate the initial analysis and environmental impact studies related to replacing and modernizing the Barking Sands Tactical Underwater Range.

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Training Range Enhancements	8.704	0.000
FY 2017 Accomplishments: Conducted Analysis of Alternatives (AOA), developed a program execution plan and implemented an environmental study to support future range upgrades.		
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

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 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	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	TBD	TBD : TBD	0.000	1.500	Mar 2018	0.000		0.000		-		0.000	0.000	1.500	1.500
Hardware Development	WR	NUWC : NEWPORT, RI	0.000	1.553	Mar 2018	0.000		0.000		-		0.000	0.000	1.553	1.533
		Subtotal	0.000	3.053		0.000		0.000		-		0.000	0.000	3.053	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	NUWC : NEWPORT, RI	0.000	4.357	Jul 2017	0.000		0.000		-		0.000	0.000	4.357	4.357
Systems Engineering	WR	NAWC-AD : PATUXENT RIVER, MD	0.000	0.449	Jul 2017	0.000		0.000		-		0.000	0.000	0.449	0.449
		Subtotal	0.000	4.806		0.000		0.000		-		0.000	0.000	4.806	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-AD : PATUXENT RIVER, MD	0.000	0.049	Jan 2018	0.000		0.000		-		0.000	0.000	0.049	0.049
		Subtotal	0.000	0.049		0.000		0.000		-		0.000	0.000	0.049	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
Prog Mngt Sup	WR	NAWC-AD : PATUXENT RIVER, MD	0.000	0.282	Jan 2018	0.000		0.000		-		0.000	0.000	0.282	0.282

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204571N / *Consolidated Trng Sys Dev*	Project (Number/Name) 9999 / *Congressional Adds*	

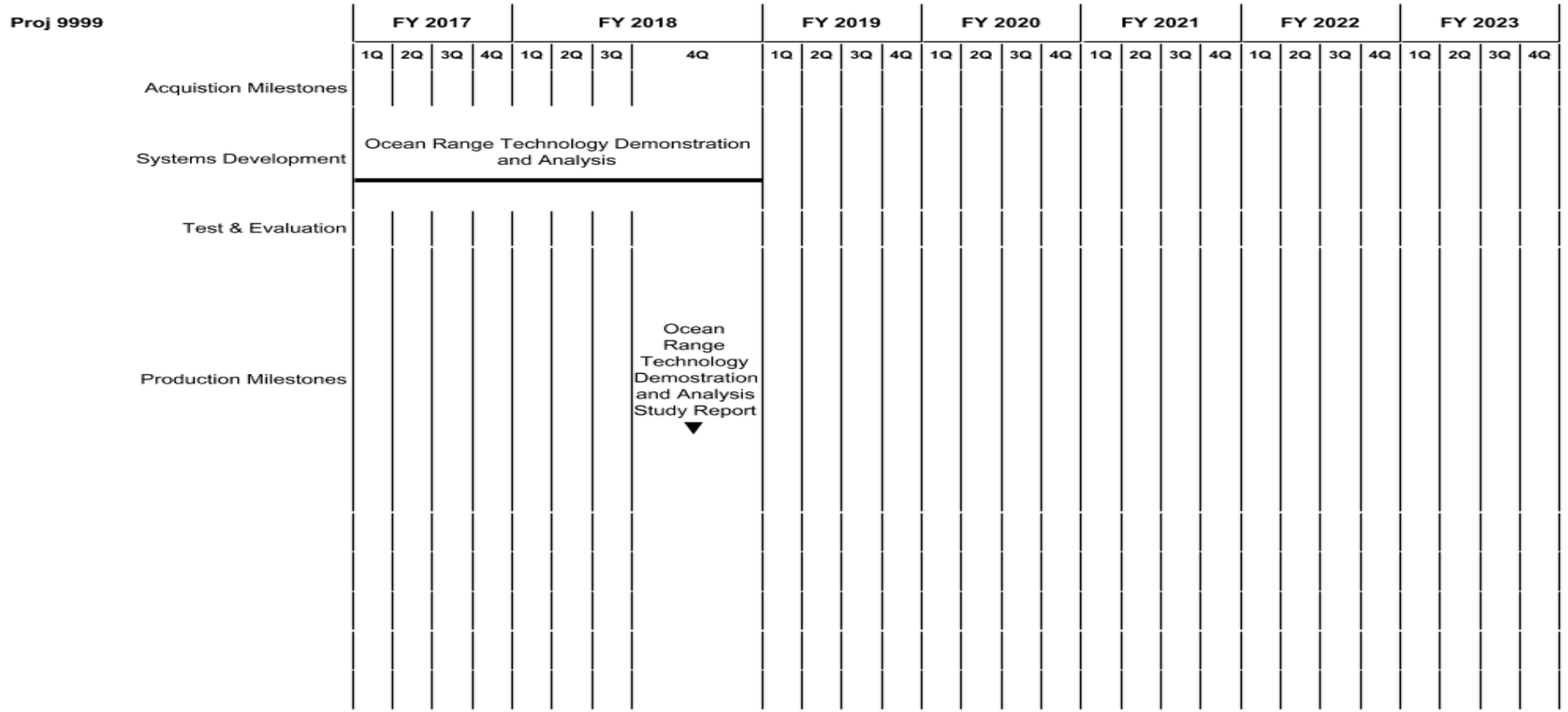
Management Services ($ in Millions)

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
Prog Mngt Sup	C/CPFF	Precise : Lexington Park, MD	0.000	0.220	Feb 2018	0.000		0.000		-		0.000	0.000	0.220	0.220
Travel	Allot	NAVAIR : PATUXENT RIVER, MD	0.000	0.025	Jul 2017	0.000		0.000		-		0.000	0.000	0.025	0.025
Prog Mngt Sup	WR	NAWCTSD : ORLANDO, FL	0.000	0.269	Jan 2018	0.000		0.000		-		0.000	0.000	0.269	0.269
		Subtotal	0.000	0.796		0.000		0.000		-		0.000	0.000	0.796	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	8.704		0.000		0.000		-		0.000	0.000	8.704	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 9999 / *Congressional Adds*



2019DON - 0204571N - 9999

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204571N / *Consolidated Trng Sys Dev*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Systems Development: Ocean Range Technology Demonstration and Analysis	1	2017	4	2018
Production Milestones: Ocean Range Technology Demonstration and Analysis Study Report	4	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204574N *I Cryptologic Direct 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	21.669	1.122	2.355	4.544	-	4.544	4.514	4.630	4.685	4.836	Continuing	Continuing
3091: *Advanced Cryptological Sys Eng (CCOP)*	21.669	1.122	2.355	4.544	-	4.544	4.514	4.630	4.685	4.836	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Advanced Cryptologic Systems Engineering - The Cryptologic Carry-on Program (CCOP) develops state-of-the-art signal acquisition systems and software in response to Combatant Command requirements for a quick-reaction surface cryptologic carry-on capability. There are 124 cryptologic capable surface ships and shore sites in the current Navy inventory; each of these is a potential user of this carry-on equipment, depending on deployment schedules and the tempo of operations. In addition, numerous other Navy and Coast Guard platforms are potential users.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	1.122	1.155	2.328	-	2.328
Current President's Budget	1.122	2.355	4.544	-	4.544
Total Adjustments	0.000	1.200	2.216	-	2.216
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	1.200	2.261	-	2.261
• Rate/Misc Adjustments	0.000	0.000	-0.045	-	-0.045

Change Summary Explanation

The FY 2019 funding request was reduced by ($0.185) 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 in funding is a result of identified Fleet priority need for continued development into the Red Falcon capability to support evolving target sets, entry into the tactical kill-chain via sensor to shipboard combat systems interface and national data management, and distribution to support Navy Distributed Signals Intelligence Operations, Joint operations with the U.S. Army and afloat.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204574N / *Cryptologic Direct Support*	Project (Number/Name) 3091 / *Advanced Cryptological Sys Eng (CCOP)*	

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
3091: *Advanced Cryptological Sys Eng (CCOP)*	21.669	1.122	2.355	4.544	-	4.544	4.514	4.630	4.685	4.836	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Advanced Cryptologic Systems Engineering - Cryptologic Carry On Program (CCOP) develops state-of-the-art signal acquisition systems and software in response to Combatant Command requirements for a quick-reaction surface, subsurface and airborne cryptologic carry-on capability. There are approximately 124 cryptologic capable surface ships and shore sites in the current Navy inventory; each is a potential user of this carry-on equipment, depending on deployment schedules and the tempo of operations. In addition, there are numerous subsurface and air platforms that are also potential users. This funding line will provide the resources to enable rapid transition of available Commercial Off-The-Shelf (COTS) and Government Off -The-Shelf (GOTS) technologies that apply to Fleet requirements for carry-on system functionalities. These technologies typically require various levels of integration to leverage on-board systems that provide system and mission management, product reporting, and data analysis. COTS / GOTS system documentation and training materials usually require adaptation or modification to meet fleet operator requirements, or entirely new training materials may need to be developed. Before deployment for operational use, systems must be systematically tested to ensure suitable and reliable operation, tested for network vulnerabilities if connected to shipboard Local Area Networks, and tested relative to interoperability requirements. Certification testing is conducted to meet Office of Naval Intelligence security requirements, and network testing is conducted in accordance with Information Technology (IT) requirements to allow connection to Navy networks. Funding will also provide resources to address rapid deployment of enhancements or improvements to the common hardware and/or software baseline of all other carry-on subsystems to meet emergent requirements.

Funding will support 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 (bombs, mortars, missiles, bullets) and non-kinetic fires (electronic attack, lasers, cyber-attack) and can also be used to enable a more complete understanding and more agile and effective exploitation of the electromagnetic spectrum.

Increase in FY19 funding to begin development of next generation Red Falcon capabilities including system upgrades to address additional targets and evolving modes of target deployment including non-traditional platforms and create advanced forward training modules. FY19 funds will continue to integrate, test, and document identified COTS and GOTS technologies and subsystems that meet emergent and on-going Fleet requirements as specified in the Signals of Interest (SOI) and target threat list, as well as, continue to develop upgrades to existing systems and subsystems according to Fleet requirements. Funds aid the development of new signal processing algorithms and software based solutions to enable rapid transition of capability to permanently installed Ship's Signal Exploitation Space (SSES) systems, including Ship's Signals Exploitation Equipment (SSEE) Family of Systems (FoS) and its variants, the research of self-contained small form factor systems for Patrol craft and other small units, and the research of Adaptive Mission Modules for rapid insertion to counter specific threats or provide intelligence in specific areas of operation. Funds also support the Navy's Counter-Unmanned Aircraft Systems (C-UAS) efforts per Joint Rapid Acquisition Council (JRAC) approved Joint Urgent Operational Need (JUON) CC-0558 and is intended to provide additional Red Falcon / Cryptologic Carry-on Program (CCOP) systems for platforms deploying to United States Central Command area of responsibility. More details are available at higher classification.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204574N / *Cryptologic Direct Support*	**Project (Number/Name)** 3091 / *Advanced Cryptological Sys Eng (CCOP)*

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 Cryptological Sys Eng - CCOP	1.122	2.355	4.544	0.000	4.544
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to integrate, test and document identified Commercial Off-The-Shelf (COTS) and Government Off -The-Shelf (GOTS) technologies and subsystems that meet emergent and on-going Fleet requirements as specified in the Signals of Interest (SOI) and target threat list. Continue to develop upgrades to existing systems and subsystems according to Fleet requirements. Continue the development of new signal processing algorithms and software based solutions to enable rapid transition to permanently installed Ship's Signal Exploitation Space (SSES) systems and the research of self-contained small form factor systems for Patrol Craft and other small units. Continue to develop enhanced Red Falcon systems to combat future SOI. Continue to research Adaptive Mission Modules for specific threats / areas for rapid insertion into permanently installed systems. OCO: FY18 Other Contingency Operations (OCO) funds to develop target signal files in order to counter the latest threats; new threat signal files must be developed and fielded to forward deployed platforms. Funds support the Navy's Counter-Unmanned Aircraft Systems (C-UAS) efforts per Joint Rapid Acquisition Council (JRAC) approved Joint Urgent Operational Need (JUON) CC-0558 and is intended to provide additional Red Falcon / Cryptologic Carry-on Program (CCOP) systems for platforms deploying to United States Central Command area of responsibility. More details are available at higher classification.					
FY 2019 Base Plans: Continue to integrate, test, and document identified COTS and GOTS technologies and subsystems that meet emergent and on-going Fleet requirements as specified in the SOI and target threat list, as well as, continue to develop upgrades to existing systems and subsystems according to Fleet requirements. Funds aid the development of new signal processing algorithms and software based solutions to enable rapid transition of capability to permanently installed SSES systems, including SSEE Family of Systems (FoS) and its variants, the research of self-contained small form factor systems for Patrol craft and other small units, and the research of Adaptive Mission Modules for rapid insertion to counter specific threats or provide intelligence in specific areas of					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204574N / *Cryptologic Direct Support*	**Project (Number/Name)** 3091 / *Advanced Cryptological Sys Eng (CCOP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
operation. FY19 funds will also initiate engineering and software development of the next generation Red Falcon capabilities using common data formatting and hardware backplane standards. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase from FY18 to FY19 addresses the requirement for enhanced interoperability with host systems and scalable deployment including non-traditional platforms, evolving target sets, and ability to create advanced forward training modules of the next generation Red Falcon capabilities. This enhancement will use the industry standard VITA 49/VPX for data formatting (Command & Control) and backplane hardware. Incorporating this engineering change allows for a seamless integration for future Pre-Planned Product Improvement (P3I) capability development efforts.					
Accomplishments/Planned Programs Subtotals	1.122	2.355	4.544	0.000	4.544

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 / 3501: *Cryptologic Communications Equipment*	22.282	14.435	11.337	2.000	13.337	9.584	10.062	11.185	11.466	0.000	155.465

Remarks

D. Acquisition Strategy

Acquisition, management, and contracting strategies support engineering and manufacturing development by providing funds to Space and Naval Warfare (SPAWAR) Systems Centers Atlantic and Pacific, and miscellaneous contractors with management oversight by SPAWAR.

E. Performance Metrics

Cryptologic Carry On Program (CCOP) delivers state-of-the-art signal acquisition software for CCOP systems in response to Combatant Command requirements for a quick-reaction surface, subsurface and airborne cryptologic carry-on capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204574N / *Cryptologic Direct Support*	Project (Number/Name) 3091 / *Advanced Cryptological Sys Eng (CCOP)*	

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	Various	Various : Various	6.109	0.000		0.000		0.000		-		0.000	0.000	6.109	-
Software Development	C/CPFF	Classified Contract : Classified Contract	5.484	0.676	Jan 2017	1.480	Jan 2018	2.856	Jan 2019	-		2.856	Continuing	Continuing	Continuing
Software Development	WR	SSC PAC : San Diego, CA	2.248	0.067	Nov 2016	0.290	Nov 2017	0.560	Nov 2018	-		0.560	Continuing	Continuing	Continuing
Software Development	WR	SSC LANT : Charleston, SC	1.614	0.150	Nov 2016	0.150	Nov 2017	0.289	Nov 2018	-		0.289	Continuing	Continuing	Continuing
		Subtotal	15.455	0.893		1.920		3.705		-		3.705	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	Various	Various : Various	1.915	0.000		0.000		0.000		-		0.000	0.000	1.915	-
Systems Engineering	C/CPFF	Classified Contract : Classified Contract	1.458	0.133	Dec 2016	0.230	Jan 2018	0.444	Jan 2019	-		0.444	Continuing	Continuing	Continuing
		Subtotal	3.373	0.133		0.230		0.444		-		0.444	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/CPFF	Classified Contract : Classified Contract	0.513	0.000		0.000		0.000		-		0.000	0.000	0.513	-
Developmental Test & Evaluation	WR	NPGS : Monterey, CA	0.226	0.023	Apr 2017	0.000		0.000		-		0.000	0.000	0.249	-
Developmental Test & Evaluation	WR	OPTEVFOR : Norfolk, VA	0.206	0.023	Apr 2017	0.000		0.000		-		0.000	0.000	0.229	-
Developmental Test & Evaluation	WR	SSC LANT : Charleston, SC	0.000	0.000		0.095	Nov 2017	0.183	Nov 2018	-		0.183	Continuing	Continuing	Continuing
		Subtotal	0.945	0.046		0.095		0.183		-		0.183	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204574N / *Cryptologic Direct Support*	**Project (Number/Name)** 3091 / *Advanced Cryptological Sys Eng (CCOP)*

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	1.273	0.000		0.000		0.000		-		0.000	0.000	1.273	-
Program Management Support	WR	SSC PAC : San Diego, CA	0.623	0.050	Nov 2016	0.110	Nov 2017	0.212	Nov 2018	-		0.212	Continuing	Continuing	Continuing
		Subtotal	1.896	0.050		0.110		0.212		-		0.212	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	21.669	1.122		2.355		4.544		-		4.544	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		**Date:** February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204574N / *Cryptologic Direct Support*	**Project (Number/Name)** 3091 / *Advanced Cryptological Sys Eng (CCOP)*

Exhibit R-4, RDT&E Program Schedule Profile — DATE: June 2017

Appropriation/Budget Activity	Program Element Name and Number	Project Name and Number
RDT&E, N / BA 7	0204574N Cryptologic Direct Support	Advanced Cryptologic Systems Engineering (CCOP) / 3091

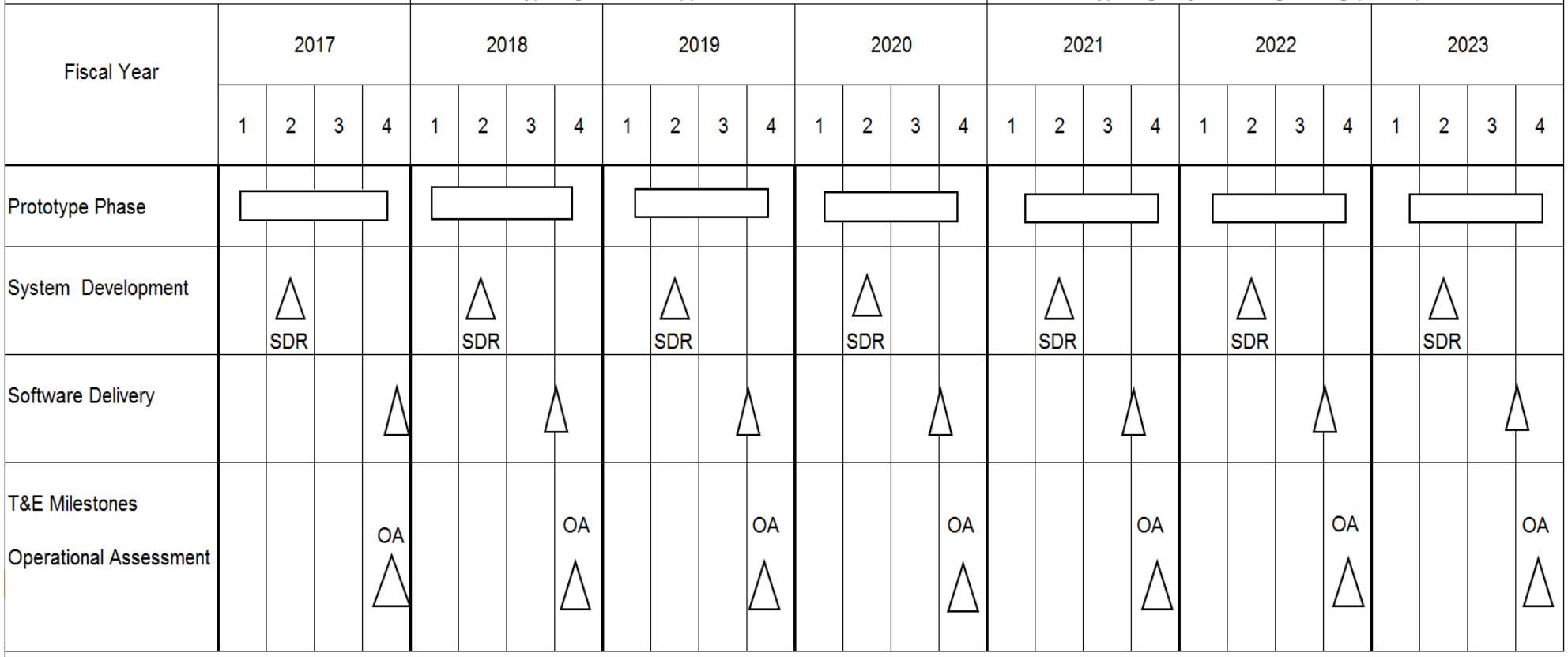


Exhibit R-4, Program Schedule Profile

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204574N / *Cryptologic Direct Support*	**Project (Number/Name)** 3091 / *Advanced Cryptological Sys Eng (CCOP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3091				
Prototype Phase - 2017	1	2017	4	2017
Prototype Phase - 2018	1	2018	4	2018
Prototype Phase - 2019	1	2019	4	2019
Prototype Phase - 2020	1	2020	4	2020
Prototype Phase - 2021	1	2021	4	2021
Prototype Phase - 2022	1	2022	4	2022
Prototype Phase -2023	1	2023	4	2023
System Design Review (SDR) - 2017	2	2017	2	2017
System Design Review (SDR) - 2018	2	2018	2	2018
System Design Review (SDR) - 2019	2	2019	2	2019
System Design Review (SDR) - 2020	2	2020	2	2020
System Design Review (SDR) - 2021	2	2021	2	2021
System Design Review (SDR) - 2022	2	2022	2	2022
System Design Review (SDR) - 2023	2	2023	2	2023
Software Delivery - 2017	3	2017	4	2017
Software Delivery - 2018	3	2018	4	2018
Software Delivery - 2019	3	2019	4	2019
Software Delivery - 2020	3	2020	4	2020
Software Delivery - 2021	3	2021	4	2021
Software Delivery - 2022	3	2022	4	2022
Software Delivery - 2023	3	2023	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204574N / *Cryptologic Direct Support*	**Project (Number/Name)** 3091 / *Advanced Cryptological Sys Eng (CCOP)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Operational Assessment (OA) - 2017	4	2017	4	2017
Operational Assessment (OA) - 2018	4	2018	4	2018
Operational Assessment (OA) - 2019	4	2019	4	2019
Operational Assessment (OA) - 2020	4	2020	4	2020
Operational Assessment (OA) - 2021	4	2021	4	2021
Operational Assessment (OA) - 2022	4	2022	4	2022
Operational Assessment (OA) - 2023	4	2023	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204575N *I Elect Warfare Readiness 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**
Total Program Element	46.403	79.410	51.040	66.889	-	66.889	68.893	68.891	72.055	73.386	Continuing	Continuing
2263: *Information Warfare System*	46.403	79.410	32.740	47.049	-	47.049	49.116	48.705	51.448	52.357	Continuing	Continuing
3426: *Maritime Cyber*	0.000	0.000	18.300	19.840	-	19.840	19.777	20.186	20.607	21.029	Continuing	Continuing

A. Mission Description and Budget Item Justification

Information Operations (IO) Counter Measure Capability Research and Development: Develops software to account for antenna modeling, weather calculations, radio frequency modeling, signals mapping and terrain modeling for warfighter use in configuring optimal Electronic Attack (EA) from afloat.

Maritime Cryptologic Systems for the 21st Century Systems Development and Support: Develops and fields spiral Electronic Support, and Cyber capabilities against U.S. Navy's prioritized signals, networks, and target sets. EA capabilities will be integrated into a software architecture baseline that is deployed on subsurface, airborne and surface Information Operations (IO) platforms (Classic Troll, Banshee and Ships Signal Exploitation Equipment Increment E and Increment F) sponsored Pacific Sail (PACSAIL) research project. Signal Descriptor File (SDF) Configuration Management Authority (SCMA) is the technical lead for the development, testing and validation of electronic support and electronic attack techniques for Maritime Cryptologic Systems in support of Navy-wide Information Operations planning.

Research, Analysis and Research and Development Technical Support: Conducts vulnerability analysis and reverse engineering on emerging threats and targets and provides specialized technical, engineering and management capabilities to the program management office.

Computer Network Operations (CNO): Funds development and testing of computer networks for modeling, simulation, and tailoring of Cyber capabilities. Develops specific Cyber tools, techniques, and operators in support of Navy requirements (details held at a higher classification level). Conducts vulnerability analyses and reverse engineering on improvised explosive devices (details held at a higher classification level).

Mocking Jay: Funds were realigned from project code 2263 Information Warfare Systems to 3426 Maritime Cyber to reflect development and testing of networks for vulnerability analysis, reverse engineering, simulation systems, and closed development networks. Additionally, this project funds Cyber Foundry, Cyber Infrastructure and the Research and Development Site to support the Navy's portion of USCYBERCOM planned Unified Platform and Cyber Mission Forces. Details held at a higher classification.

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 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0204575N *I Elect Warfare Readiness Supt*			
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	99.998	51.040	70.389	-	70.389
Current President's Budget	79.410	51.040	66.889	-	66.889
Total Adjustments	-20.588	0.000	-3.500	-	-3.500
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.706	0.000			
• SBIR/STTR Transfer	-3.176	0.000			
• Program Adjustments	0.000	0.000	-2.722	-	-2.722
• Rate/Misc Adjustments	0.000	0.000	-0.778	-	-0.778
• Congressional Directed Reductions Adjustments	-16.706	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($0.152) 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 2019 funding request was reduced by $1.486 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 / 7	R-1 Program Element (Number/Name) PE 0204575N / *Elect Warfare Readiness Supt*	Project (Number/Name) 2263 / *Information 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
2263: *Information Warfare System*	46.403	79.410	32.740	47.049	-	47.049	49.116	48.705	51.448	52.357	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Information Operations (IO) Counter Measure Capability Research and Development: Develops software to account for antenna modeling, weather calculations, radio frequency modeling, signals mapping and terrain modeling for warfighter use in configuring optimal Electronic Attack (EA) from afloat.

Maritime Cryptologic Systems for the 21st Century Systems Development and Support: Develops and fields spiral Electronic Support, and Cyber capabilities against U.S. Navy's prioritized signals, networks, and target sets. EA capabilities will be integrated into a software architecture baseline that is deployed on subsurface, airborne and surface Information Operations (IO) platforms (Classic Troll, Banshee and Ships Signal Exploitation Equipment Increment E and Increment F) sponsored Pacific Sail (PACSAIL) research project. Signal Descriptor File (SDF) Configuration Management Authority (SCMA) is the technical lead for the development, testing and validation of electronic support and electronic attack techniques for Maritime Cryptologic Systems in support of Navy-wide Information Operations planning.

Research, Analysis and Research and Development Technical Support: Conducts vulnerability analysis and reverse engineering on emerging threats and targets and provides specialized technical, engineering and management capabilities to the program management office.

Computer Network Operations (CNO): Funds development and testing of computer networks for modeling, simulation, and tailoring of Cyber capabilities. Develops specific Cyber tools, techniques, and operators in support of Navy requirements (details held at a higher classification level). Conducts vulnerability analyses and reverse engineering on improvised explosive devices (details held at a higher classification level).

Increase between FY18 and FY19 is due to antenna refurbishment in Maryland and at an OCONUS site. Site is classified. Additionally, increase will do the following: 1) support ship integration, modeling to support operational implementation, technical review in support of transition to SPAWAR, and operational evaluation of a "speed to fleet" Computer Network Operation and Electronic Warfare projects. 2) Management and engineering services for mission essential systems engineering and security tasks in support of operational shipboard testing. 3) Regain traction to further develop Electronic Warfare to meet emergent technical threats; enhance cyber research and development; and development/deployment Radio Frequency (RF). 4) Enhance validation of Signal Descriptor (SDF) file collection and results in complete ship self-defense warning indications and signal collections for the war-fighter.

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 / Information and Computer Network Operations (IO & CNO) and Countermeasure Capability Research & Development	54.672	32.740	47.049	0.000	47.049
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Develops and uses modeling and simulation techniques to prototype and test emergent waveforms. Funds support additional site infrastructure updates for collection efforts, extend technical understanding, continue capability development, and deliver stand-alone Prototypes to test and integrate waveforms for countering adversary systems. In addition, conducts research operations to provide Strategic Indications and Warnings (I&W) and Operational Intelligence analysis (details held at a higher classification level). Information Operations (IO) Countermeasure Capability Research and Development (R&D) processes used to develop, test, prototype, and integrate electronic attack wave forms are nearly identical to Maritime Cryptologic Systems (MCS-21), involve its own unique set of signal types. Develops and fields spiral Electronic Support (ES), Electronic Attack (EA) and cyber capabilities against Fleet Forces Command prioritized signals, networks and target sets. Capabilities will be integrated into a software architecture baseline that is deployed on subsurface, airborne and surface. Also, Information Operations platforms (Classic Troll, Banshee and Ships Signal Exploitation Equipment Increment E and F). Signal Descriptor File (SDF) Configuration Management Authority (SCMA) is the technical lead for the development, testing and validation of ES and EA techniques for MCS-21 in support of Navy-wide Information Operations planning (details held at higher classification level). The MCS-21 processes used to develop, test, prototype, and integrate electronic attack wave forms are nearly identical to IO Countermeasure Capability R&D, however, involve its own unique set of classified signal types. Conducts vulnerability analysis and reverse engineering on emerging threats and targets and provides specialized technical, engineering and management capabilities to the program management office. Funding is required for development and use of modeling and simulations techniques to prototype and test emergent waveforms (details held at higher classification level). ***FY 2018 Plans:*** *All FY18 activities are iterative in a dynamic and evolving signals environment *Additional Site infrastructure updates are to support search, collection, and survey efforts, and further technical understanding and capability development. Additionally, develop and test capabilities in a maritime operational environment, and deliver stand-alone prototypes to test and integrate different systems. Funds support additional hardware and software required to transition these capabilities to the fleet *Integrate Information Operations (IO)/Electronic Attack (EA) capability into fleet systems and platforms (details held at a higher classification level)					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
*Develop and test IO Countermeasures capabilities across various platforms *Develop and test Capabilities in a maritime operational environment (details held at a higher classification level) *Conduct search operations to provide strategic Indications and Warnings (I&W) and Operational Intelligence (OPINTEL) analysis *Deliver stand-alone prototypes to test and integrate waveforms for countering adversary systems *Conduct software updates and system maintenance on search and survey systems *Provide technical information to increase effectiveness of IO systems development/planning and situational awareness *Conduct surveys and planning for additional search and survey site *Modeling and Simulation Lab (applied/projected level of effort) (details held at a higher classification level) *Modeling and Simulation products and support (details held at a higher classification level) *Weekly Signals Intelligence assessments *Linguist support and open source research *Information Systems Engineering Automated Information Systems and IT support *Material shipment, building inspection, site maintenance, alternate facility, and government vehicle maintenance *Program management, acquisition, and systems engineering support *Develop and test IO Countermeasures capabilities across various platforms *Develop specific waveforms to attack adversary systems *Develop and use modeling and simulations techniques to prototype and test emergent waveforms *Information Warfare (IW)/Information Operations (IO) Electronic Attack (EA) capability development (details held at a higher classification level) *Waveform Weapon Development *Integrate MCS-21 Planning Optimization and Tasking Services (MPOTS) 3.x with CLASSIC REACH capability *Upgrade current SDF development and validation systems to maintain concurrency with systems on maritime platforms (software upgrade) *Upgrade systems and infrastructure to support next generation electronic support and electronic attack capability development. As a result of enhanced development capabilities, the number of priority signals that can be demodulated and decoded has increased (details held at a higher classification level) *Engineering, equipment integration, mission planning analysis, logistics, accreditation, and training for Tactical Research and Target Development (TRTD) *Acquisition of new Signal Intelligence (SIGINT) technologies and research *Systems administration and Information Assurance & Accreditation *Research signal analysis lab (RSAL) upgrades					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
*Hexadecimal code analysis and reverse engineering project *Secure DevOps prototype capability proof of concept *NPS research efforts to support operation requirements (details held at a higher classification level) *DevOps environment tech refresh and expansion *Scalable secure DevOps capability design and implementation *Mission oriented software research and development *Maritime commercial architecture research *Test centric DevOps environment support *Expeditionary Cyber *Maritime navigation analysis *Project detail held at a classified level *Position Navigation & Timing Research					
FY 2019 Base Plans: *All FY19 activities are iterative in a dynamic and evolving signals environment, *Additional Site infrastructure updates are to support search, collection, and survey efforts, and further technical understanding and capability development. Additionally, develop and test capabilities in a maritime operational environment, and deliver stand-alone prototypes to test and integrate different systems. Funds support additional hardware and software required to transition these capabilities to the fleet *Integrate Information Operations (IO) / Electronic Attack (EA) capability into fleet systems and platforms (details held at a higher classification level) *Develop and Test Capabilities in a maritime operational environment (details held at a higher classification level) *Continue to conduct search operations to provide strategic Indications and Warnings (I&W) and OPINTEL analysis *Deliver stand-alone prototypes to test and integrate waveforms for countering adversary systems *Conduct software updates and system maintenance on search and survey systems *Provide technical information to increase effectiveness of Information Operations (IO) systems development/ planning and situational awareness *Conduct surveys and planning for additional search and survey site *Modeling and Simulation Lab (applied/projected level of effort) (details held at a higher classification level) *Modeling and Simulation products and support (details held at a higher classification level) *Weekly SIGINT assessments					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
*Linguist support and open source research *Information Systems Engineering Automated Information Systems and IT support *Material shipment, building inspection, site maintenance, COOP facility, and government vehicle maintenance *Program management, acquisition, and systems engineering support *Develop and test IO Countermeasures capabilities across various platforms *Develop specific waveforms to attack adversary systems *Develop and use modeling and simulations techniques to prototype and test emergent waveforms *Information Warfare (IW) / Information Operations (IO) Electronic Attack (EA) capability development (details held at a higher classification level) *Waveform Weapon Development *Integrate MCS-21 Planning Optimization and Tasking Services 3.x with CLASSIC REACH *Upgrade current Signal Data File development and validation systems to maintain concurrency with systems on maritime platforms (software upgrade) *Increase development and testing of electronic attack capabilities across maritime platforms *Upgrade systems and infrastructure to support next generation electronic support and electronic attack capability development. As a result of enhanced development capabilities, the number of priority signals that can be demodulated and decoded has increased (details held at a higher classification level) *Engineering, equipment integration, mission planning analysis, logistics, accreditation, and training for TRTD *Acquisition of new SIGINT technologies and research *Systems administration and Information Assurance & Accreditation *Research signal analysis lab (RSAL) upgrades *Hexadecimal code analysis and reverse engineering project *Secure DevOps prototype capability proof of concept *NPS research efforts to support operation requirements (details held at a higher classification level) *DevOps environment tech refresh and expansion *Project detail held at a high level *Ship integration to support operational implementation and operational evaluation of a "speed to fleet" Computer Network Operation and Electronic Warfare projects *Management and engineering services for mission essential systems engineering and security tasks in support of operational shipboard testing *Further develop Electronic Warfare to meet emergent technical threats *Enhance cyber research and Radio Frequency (RF) development/deployment					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
*Enhance validation of Signal Descriptor (SDF) file collection and results in complete ship self-defense warning indications and signal collections for the war-fighter *Scalable secure DevOps capability design and implementation *Mission oriented software research and development *Maritime commercial architecture research *Test centric DevOps environment support *Expeditionary Cyber *Maritime navigation analysis *Position Navigation & Timing Research ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase between FY18 and FY19 is due to antenna refurbishment in Maryland and at an OCONUS site. Site is classified. The FY 2019 funding request was reduced by $1.486 million to account for the availability of prior year execution balances.					
Title: Mocking Jay ***Articles:*** ***Description:*** FY18 funding for MOCKING JAY realigning from project 2263 Information Warfare Systems to project 3426 Maritime Cyber. ***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:*** Funding was moved in FY17 to project 3426 Maritime Cyber	24.738 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	79.410	32.740	47.049	0.000	47.049

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

These Projects are designated both ACAT III and non-ACAT and operate under streamlined acquisition. The non-ACAT designation supports a streamlined acquisition process using the Advanced Concept Technology Demonstration documentation of the Defense Acquisition Guidance.

E. Performance Metrics

Measures include quality and impact of new ideas and approaches, the success of the technology application in satisfying Combatant Commanders and Fleet requirements, and successful cost effective transition of the capability into operational systems. The goal of these investments is to provide to Commanders non-kinetic options to influence adversaries and prevent escalation of crises. Due to the nature and classification of these efforts, qualitative measures are used. It is the intent through the development of modeling and simulation scenarios and capabilities to develop quantitative metrics. The success of this depends heavily on the insight obtained via various intelligence community efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare 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
Primary Hardware Development	Various	Classified-1 : Classified	11.810	23.464	Oct 2016	5.697	Oct 2017	13.503	Oct 2018	-		13.503	Continuing	Continuing	Continuing
System Engineering	SS/CPFF	Applied Research Laboratory : University Park, PA	6.885	7.932	Dec 2016	7.057	Oct 2017	6.113	Oct 2018	-		6.113	0.000	27.987	-
Systems Engineering	WR	NRL : Washington, DC	6.704	9.486	Oct 2016	3.725	Oct 2017	3.562	Oct 2018	-		3.562	0.000	23.477	-
Ancillary Hardware Development	Various	Classified : Classified	0.500	5.000	Nov 2016	2.367	Oct 2017	4.346	Oct 2018	-		4.346	0.000	12.213	-
Training Development (Classified)	Reqn	Classified : Classifed	0.159	0.009	Oct 2016	0.950	Oct 2017	2.849	Oct 2018	-		2.849	0.000	3.967	-
		Subtotal	26.058	45.891		19.796		30.373		-		30.373	Continuing	Continuing	N/A

Remarks

Training Development: Contract Method is Goverment Purchase Card (GPC).

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	SS/CPFF	ARGON-1 : Fairfax, VA	0.604	0.570	Dec 2016	0.575	Oct 2017	2.400	Oct 2018	-		2.400	0.000	4.149	-
Software Development	SS/CPFF	L3 Communications : New York, NY	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Development Support	WR	SSC PAC : San Diego, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Software Development	SS/CPFF	ARGON-2 : Fairfax, VA	0.000	0.000		0.000		0.268	Oct 2018	-		0.268	0.000	0.268	-
Development Support	WR	NRL-1 : Washington, DC	2.420	4.388	Oct 2016	3.720	Oct 2017	3.270	Oct 2018	-		3.270	0.000	13.798	-
Development Support	Various	Classified-1 : Classified	0.750	13.590	Oct 2016	5.075	Oct 2017	0.594	Oct 2018	-		0.594	0.000	20.009	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare 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
Studies & Analysis	WR	NRL-2 : Washington, DC	0.413	0.000		0.000		0.000		-		0.000	0.000	0.413	-
Software Development	SS/CPFF	ARL : University Park, PA	0.000	0.000		0.000		1.672	Oct 2018	-		1.672	0.000	1.672	-
Software Development	Various	Classified-2 : Classified	2.420	4.100	Jan 2017	0.000		0.686	Oct 2018	-		0.686	0.000	7.206	-
NSMA	Various	Classified : Classified	0.750	0.000		0.000		1.380	Oct 2018	-		1.380	0.000	2.130	-
Integrated Logistics Support (ILS)	Reqn	NAVICP : Philadelphia, PA	0.120	0.075	Dec 2016	0.075	Oct 2017	0.129	Oct 2018	-		0.129	0.000	0.399	-
Technical Data (Software Programs & Ref Materials)	Reqn	NPWC : Chesapeake, VA	0.065	0.040	Nov 2016	0.050	Nov 2017	0.748	Nov 2018	-		0.748	0.000	0.903	-
Engineering Support	Various	Classified : Classified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Studies & Analysis	MIPR	Classified : Classified	2.622	0.000		0.000		0.000		-		0.000	0.000	2.622	-
Comm'l Drivers Licenses (CDL)	Reqn	Classified : Classified	0.050	0.000	Jan 2017	0.045	Jan 2018	0.082	Oct 2018	-		0.082	0.000	0.177	-
		Subtotal	10.214	22.763		9.540		11.229		-		11.229	0.000	53.746	N/A

Remarks

CDL, ILS & Tech Data: Contract Method is Goverment Purchase Card (GPC).

CDLs are required for Command Personnel to drive Command Vehicles supporting the installation of mission 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 & Evaluation	WR	NAWC : China Lake, CA	0.586	2.870	Dec 2016	0.000	Oct 2017	0.000	Oct 2018	-		0.000	0.000	3.456	-
Mod & Sim	Various	Contract : Classified	0.000	0.000		1.069	Oct 2017	1.569	Oct 2018	-		1.569	0.000	2.638	-
Operational Test & Evaluation	Various	Not Specified : Not Specified	0.000	0.000		0.355	Oct 2017	1.052	Oct 2018	-		1.052	0.000	1.407	-
		Subtotal	0.586	2.870		1.424		2.621		-		2.621	0.000	7.501	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare 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
Program Management Services	Various	Classified-2 : Classified	1.330	0.950	Dec 2016	1.980	Oct 2017	2.826	Oct 2018	-		2.826	0.000	7.086	-
Engineering & Develoment Services	Various	Classified-4 : Classified	0.000	3.256	Dec 2016	0.000		0.000		-		0.000	0.000	3.256	-
Program Management Services	Various	Classified : Classified	3.329	2.164	Dec 2016	0.000		0.000		-		0.000	0.000	5.493	-
Contractor Engineering Services	Various	Classifed : Classified	1.320	0.770	Nov 2016	0.000		0.000		-		0.000	0.000	2.090	-
Program Analysis Services (Classified)	Various	Classified : Classified	3.566	0.746	Dec 2016	0.000		0.000		-		0.000	0.000	4.312	-
		Subtotal	9.545	7.886		1.980		2.826		-		2.826	0.000	22.237	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	46.403	79.410		32.740		47.049		-		47.049	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

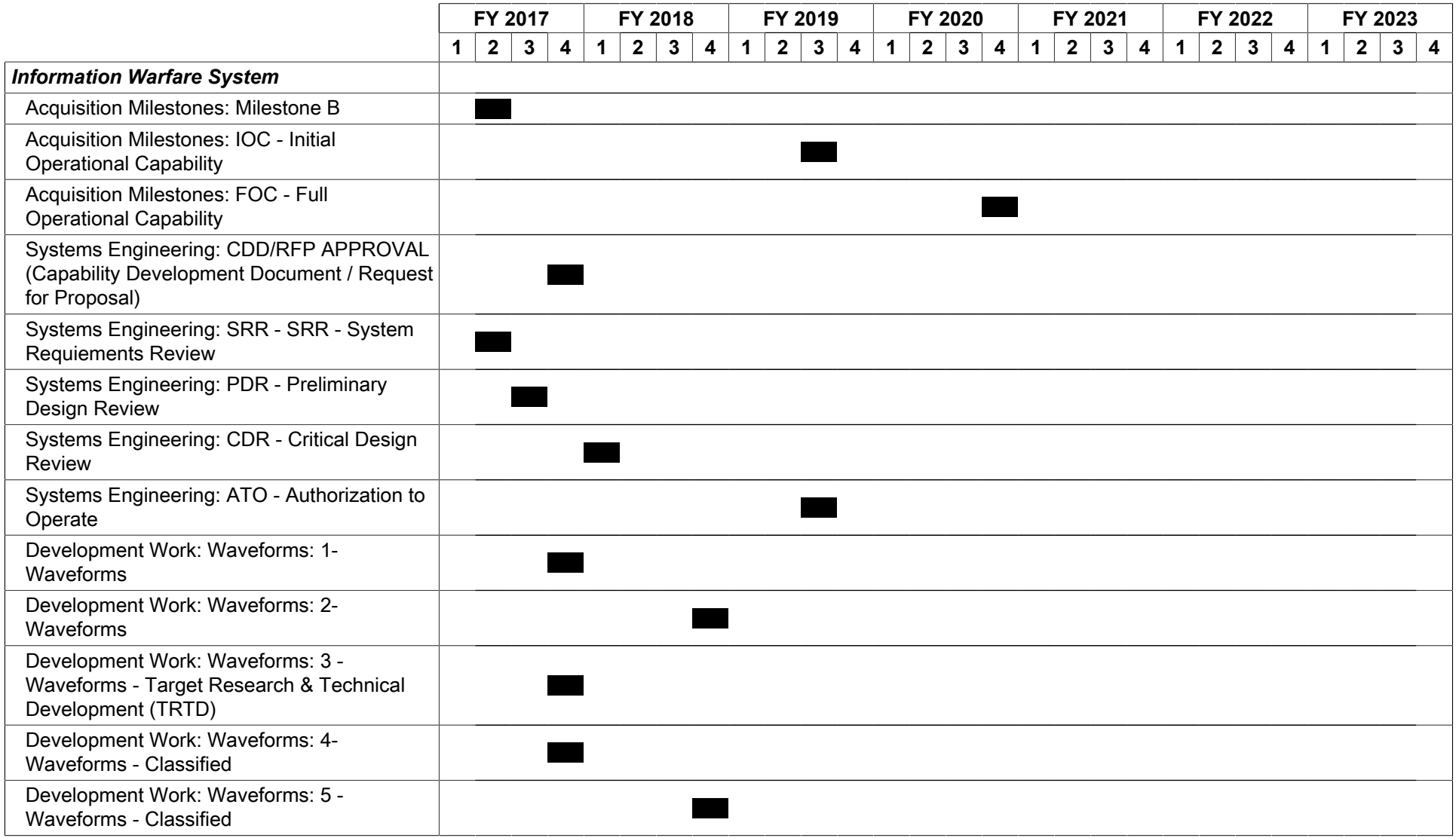


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

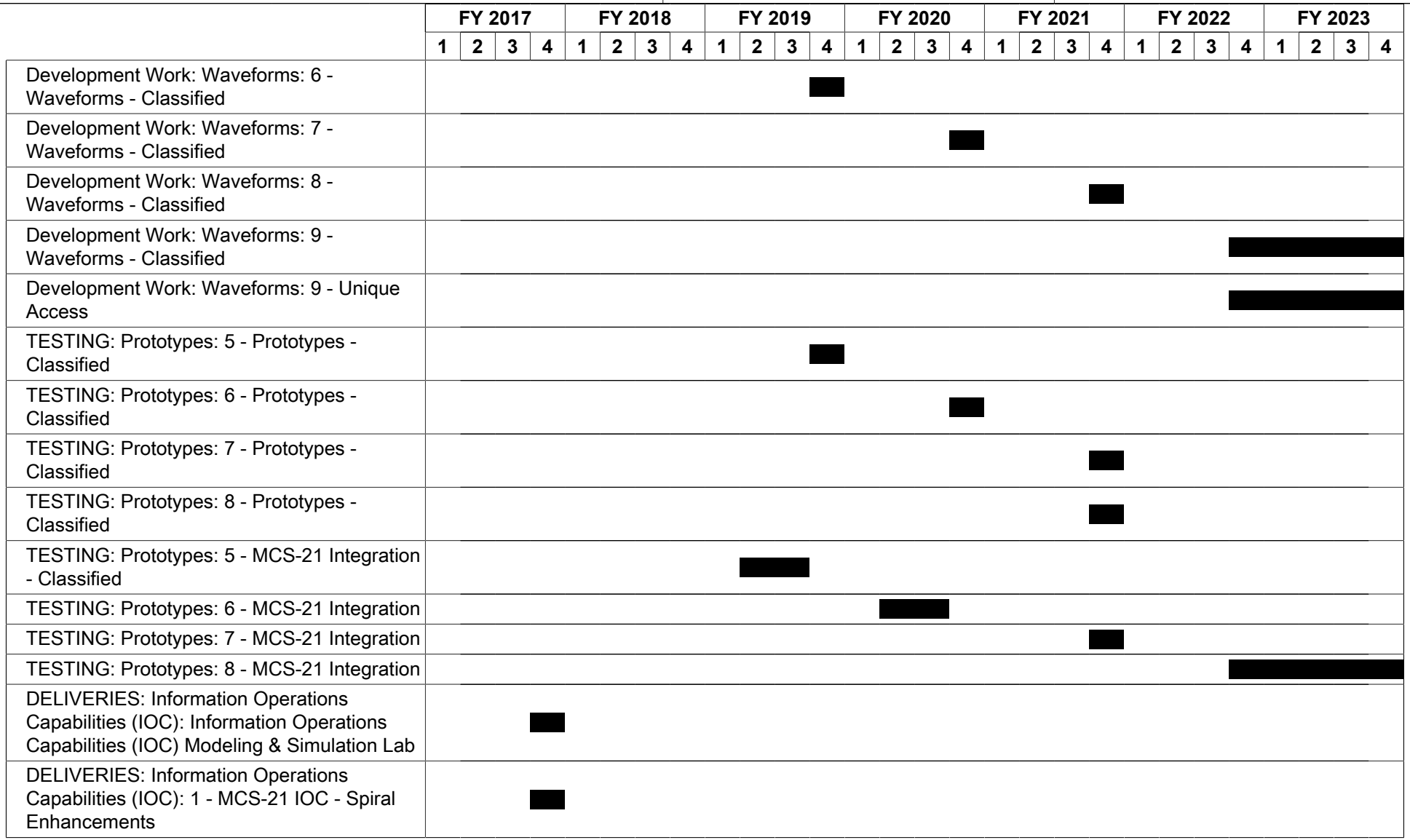


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

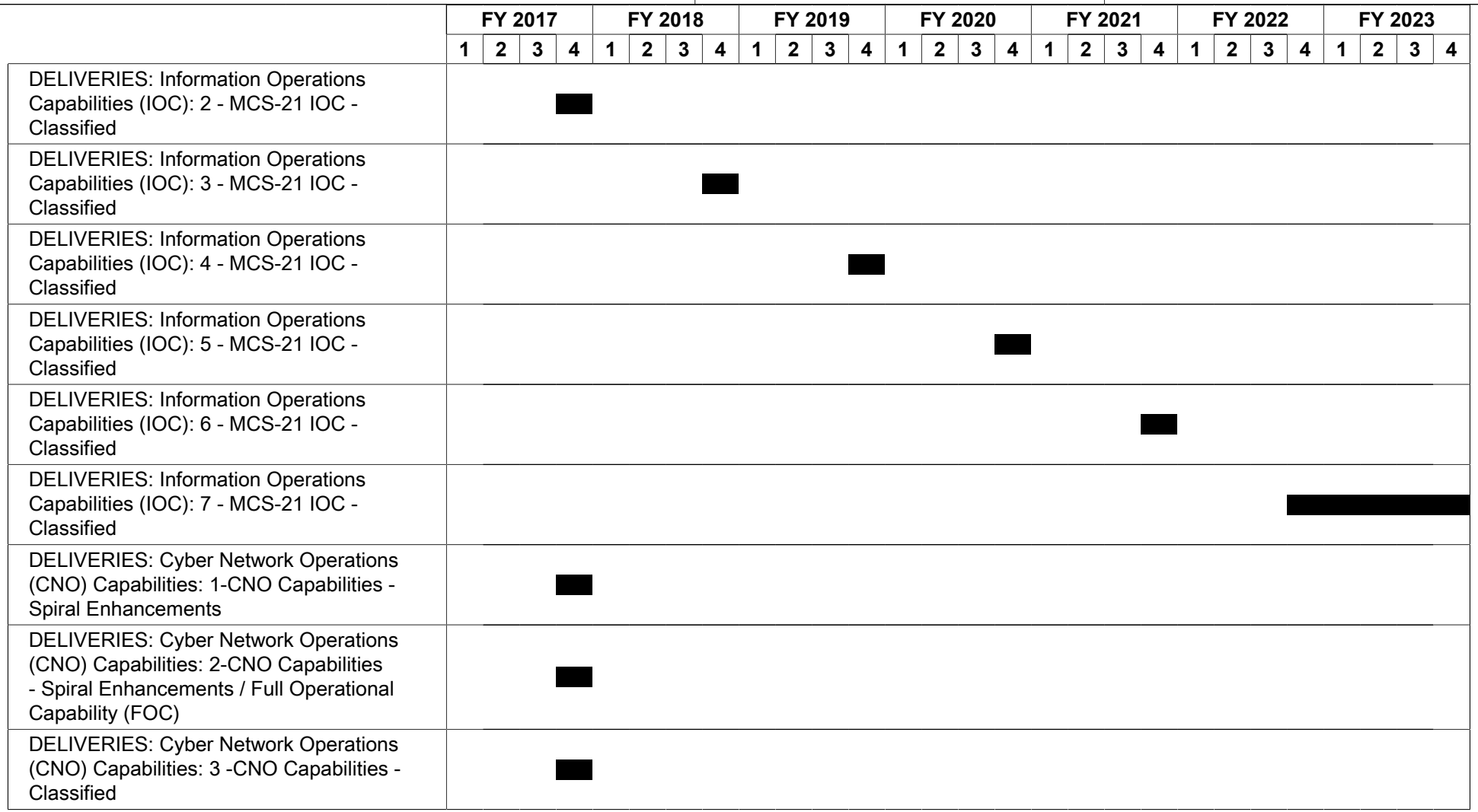


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

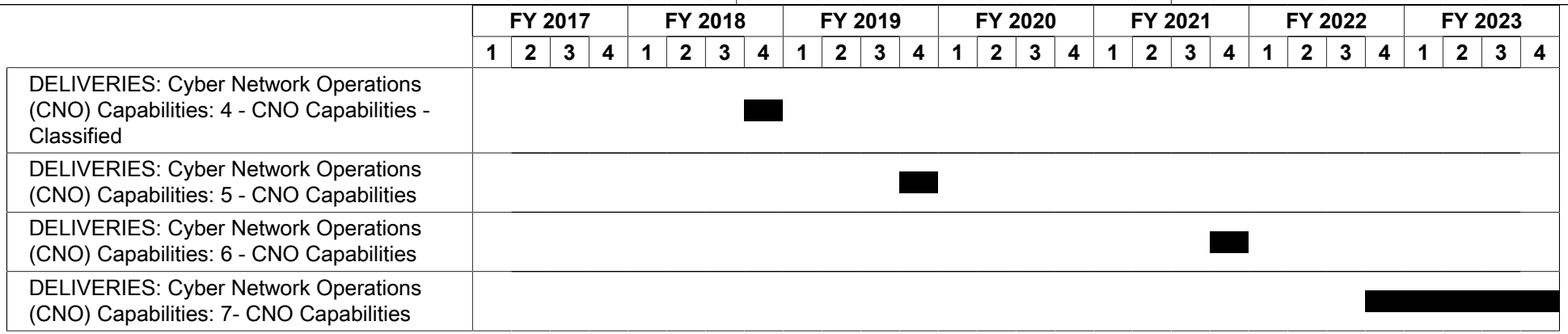


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Information Warfare System				
Acquisition Milestones: Milestone B	2	2017	2	2017
Acquisition Milestones: IOC - Initial Operational Capability	3	2019	3	2019
Acquisition Milestones: FOC - Full Operational Capability	4	2020	4	2020
Systems Engineering: CDD/RFP APPROVAL (Capability Development Document / Request for Proposal)	4	2017	4	2017
Systems Engineering: SRR - SRR - System Requiements Review	2	2017	2	2017
Systems Engineering: PDR - Preliminary Design Review	3	2017	3	2017
Systems Engineering: CDR - Critical Design Review	1	2018	1	2018
Systems Engineering: ATO - Authorization to Operate	3	2019	3	2019
Development Work: Waveforms: 1-Waveforms	4	2017	4	2017
Development Work: Waveforms: 2-Waveforms	4	2018	4	2018
Development Work: Waveforms: 3 - Waveforms - Target Research & Technical Development (TRTD)	4	2017	4	2017
Development Work: Waveforms: 4- Waveforms - Classified	4	2017	4	2017
Development Work: Waveforms: 5 - Waveforms - Classified	4	2018	4	2018
Development Work: Waveforms: 6 - Waveforms - Classified	4	2019	4	2019
Development Work: Waveforms: 7 - Waveforms - Classified	4	2020	4	2020
Development Work: Waveforms: 8 - Waveforms - Classified	4	2021	4	2021
Development Work: Waveforms: 9 - Waveforms - Classified	4	2022	4	2023
Development Work: Waveforms: 9 - Unique Access	4	2022	4	2023
TESTING: Prototypes: 5 - Prototypes - Classified	4	2019	4	2019
TESTING: Prototypes: 6 - Prototypes - Classified	4	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 2263 / *Information Warfare System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TESTING: Prototypes: 7 - Prototypes - Classified	4	2021	4	2021
TESTING: Prototypes: 8 - Prototypes - Classified	4	2021	4	2021
TESTING: Prototypes: 5 - MCS-21 Integration - Classified	2	2019	3	2019
TESTING: Prototypes: 6 - MCS-21 Integration	2	2020	3	2020
TESTING: Prototypes: 7 - MCS-21 Integration	4	2021	4	2021
TESTING: Prototypes: 8 - MCS-21 Integration	4	2022	4	2023
DELIVERIES: Information Operations Capabilities (IOC): Information Operations Capabilities (IOC) Modeling & Simulation Lab	4	2017	4	2017
DELIVERIES: Information Operations Capabilities (IOC): 1 - MCS-21 IOC - Spiral Enhancements	4	2017	4	2017
DELIVERIES: Information Operations Capabilities (IOC): 2 - MCS-21 IOC - Classified	4	2017	4	2017
DELIVERIES: Information Operations Capabilities (IOC): 3 - MCS-21 IOC - Classified	4	2018	4	2018
DELIVERIES: Information Operations Capabilities (IOC): 4 - MCS-21 IOC - Classified	4	2019	4	2019
DELIVERIES: Information Operations Capabilities (IOC): 5 - MCS-21 IOC - Classified	4	2020	4	2020
DELIVERIES: Information Operations Capabilities (IOC): 6 - MCS-21 IOC - Classified	4	2021	4	2021
DELIVERIES: Information Operations Capabilities (IOC): 7 - MCS-21 IOC - Classified	4	2022	4	2023
DELIVERIES: Cyber Network Operations (CNO) Capabilities: 1-CNO Capabilities - Spiral Enhancements	4	2017	4	2017
DELIVERIES: Cyber Network Operations (CNO) Capabilities: 2-CNO Capabilities - Spiral Enhancements / Full Operational Capability (FOC)	4	2017	4	2017
DELIVERIES: Cyber Network Operations (CNO) Capabilities: 3 -CNO Capabilities - Classified	4	2017	4	2017
DELIVERIES: Cyber Network Operations (CNO) Capabilities: 4 - CNO Capabilities - Classified	4	2018	4	2018
DELIVERIES: Cyber Network Operations (CNO) Capabilities: 5 - CNO Capabilities	4	2019	4	2019
DELIVERIES: Cyber Network Operations (CNO) Capabilities: 6 - CNO Capabilities	4	2021	4	2021
DELIVERIES: Cyber Network Operations (CNO) Capabilities: 7- CNO Capabilities	4	2022	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204575N / *Elect Warfare Readiness Supt*	Project (Number/Name) 3426 / *Maritime Cyber*	

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
3426: *Maritime Cyber*	0.000	0.000	18.300	19.840	-	19.840	19.777	20.186	20.607	21.029	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mocking Jay: Funds were realigned from project code 2263 Information Warfare Systems to 3426 Maritime Cyber to reflect development and testing of networks for vulnerability analysis, reverse engineering, simulation systems, and closed development networks. Additionally, this project funds Cyber Foundry, Cyber Infrastructure and the Research and Development Site to support the Navy's portion of USCYBERCOM planned Unified Platform and Cyber Mission Forces. Details held at a higher classification.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Mocking Jay	0.000	18.300	19.840	0.000	19.840
Articles:	-	-	-	-	-

Description: Analytical and engineering effort to develop cyber capabilities in the maritime domain. Produces Cyber capabilities to meet Navy cyber requirements. Increased funding provides physical space for Cyber Research & Development teams. Enables development of new operating systems to ensure access and cyber weapons delivery. Provides Navy contribution to the United States Cyber Command (USCYBERCOM) planned Unified Platform and Cyber Mission Force (details held at a higher classification level).

FY 2018 Plans:

*Develop intelligence analysis to determine specific technical vulnerabilities for Computer Network Operations

*Fund specialized information technology and exploitation capabilities to create a premier Navy Cyberspace development capability

*Fund the Cyber Infrastructure to support technical Research & Development of the Navy portion of the USCYBERCOM planned Unified Platform (details held at a higher classification level)

FY 2019 Base Plans:

*Maritime cyber effects development requires a state of the art facility, equipped with a reconfigurable space, a hardware lab, and software development capacity at multiple classification levels. Industry standard practices for software development, risk assessment, and collateral impact require a development network at each classification level, a separate test network with the ability to generate a representative environment, and the ability to conduct testing with hardware in the loop. Funding will provide the ability to deliver cyber capability to

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 3426 / *Maritime Cyber*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
maritime forces in support of COCOM requirements. Extension of a Title 10 network will allow for potential cyber reconnaissance and surveillance, and provide the Navy a basic capability against which to maintain readiness for future cyber warfare. (Details available at a higher classification.) *Further fund specialized information technology and exploitation capabilities in order to create a premier Navy Cyberspace development capability *Further fund the Cyber Infrastructure to support technical Research & Development of the Navy portion of the USCYBERCOM planned Unified Platform (details held at a higher classification level) *Efforts will focus on delivery and sustainment of a non-kinetic effect that can potentially hold a target at risk during all phase of operations. (Details available at a higher classification.) ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY18 to FY19 is to support Phase 2 of the Navy's innovative intelligence activity to develop analytical and engineering assessments, an industrial Laboratory facility which will provide training and certification of the Navy's contribution to the USCYBERCOM Cyber Mission Force, and development of new Cyber capabilities and accesses to meet COCOM/USCYBERCOM requirements.					
Accomplishments/Planned Programs Subtotals	0.000	18.300	19.840	0.000	19.840

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is part of a designated Acquisition Category 3 (ACAT III) and non-ACAT and operate under streamlined acquisition. The non-ACAT designation supports a streamlined acquisition process using the Advanced Concept Technology Demonstration documentation of the Defense Acquisition Guidance.

E. Performance Metrics

Measures include quality and impact of new ideas and approaches, the success of the technology and Cyber application in satisfying Combatant Commanders and Fleet requirements, and successful cost effective transition of the capability into operational systems. The goal of these investments is to provide to Commanders non-kinetic options to influence adversaries and prevent escalation of crises. Due to the nature and classification of these efforts, qualitative measures are used. It is the

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 3426 / *Maritime Cyber*

intent through the development of modeling and simulation scenarios and capabilities to develop quantitative metrics. The success of this depends heavily on the insight obtained via various intelligence community efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204575N / *Elect Warfare Readiness Supt*	Project (Number/Name) 3426 / *Maritime Cyber*	

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	Various	Classified : Classified	0.000	0.000		3.300	Nov 2017	3.680	Nov 2018	-		3.680	Continuing	Continuing	Continuing
System Engineering	SS/CPFF	Applied Research Laboratory : University Park, PA	0.000	0.000		5.000	Dec 2017	5.132	Dec 2018	-		5.132	0.000	10.132	-
System Engineering	WR	Naval Research Laboratory : Washington, DC	0.000	0.000		5.000	Oct 2017	5.452	Oct 2018	-		5.452	0.000	10.452	-
		Subtotal	0.000	0.000		13.300		14.264		-		14.264	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	Naval Research Laboratory : Washington, DC	0.000	0.000		2.000	Nov 2017	2.230	Nov 2018	-		2.230	0.000	4.230	-
Development Support	Various	Classified : Classified	0.000	0.000		2.000	Nov 2017	2.230	Nov 2018	-		2.230	0.000	4.230	-
		Subtotal	0.000	0.000		4.000		4.460		-		4.460	0.000	8.460	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
Need Item Text	C/BA	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
		Subtotal	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 3426 / *Maritime Cyber*

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 Development Services	Various	Classified-4 : Classified	0.000	0.000		0.500	Dec 2017	0.558	Dec 2018	-		0.558	0.000	1.058	-
Program Management Services	Various	Classified : Classified	0.000	0.000		0.500	Dec 2017	0.558	Dec 2018	-		0.558	0.000	1.058	-
		Subtotal	0.000	0.000		1.000		1.116		-		1.116	0.000	2.116	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	0.000	0.000		18.300		19.840		-		19.840	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 3426 / *Maritime Cyber*

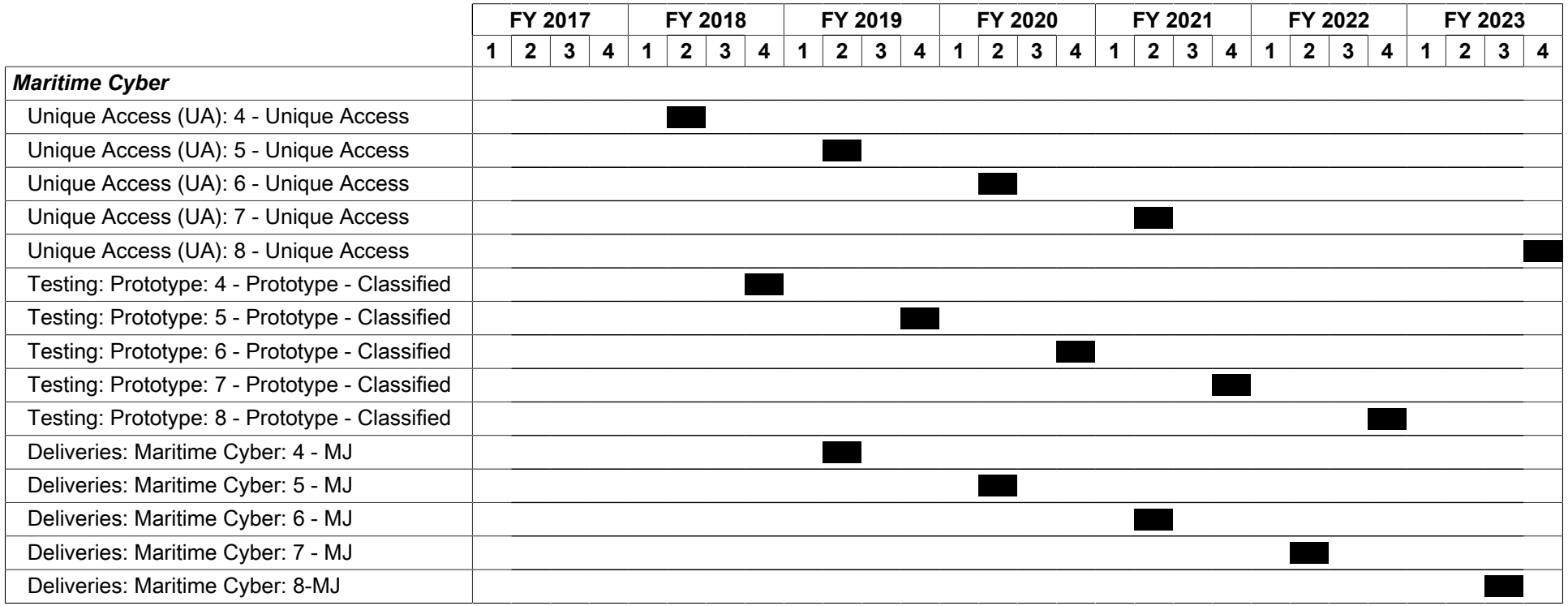


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204575N / *Elect Warfare Readiness Supt*	**Project (Number/Name)** 3426 / *Maritime Cyber*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Maritime Cyber				
Unique Access (UA): 4 - Unique Access	2	2018	2	2018
Unique Access (UA): 5 - Unique Access	2	2019	2	2019
Unique Access (UA): 6 - Unique Access	2	2020	2	2020
Unique Access (UA): 7 - Unique Access	2	2021	2	2021
Unique Access (UA): 8 - Unique Access	4	2023	4	2023
Testing: Prototype: 4 - Prototype - Classified	4	2018	4	2018
Testing: Prototype: 5 - Prototype - Classified	4	2019	4	2019
Testing: Prototype: 6 - Prototype - Classified	4	2020	4	2020
Testing: Prototype: 7 - Prototype - Classified	4	2021	4	2021
Testing: Prototype: 8 - Prototype - Classified	4	2022	4	2022
Deliveries: Maritime Cyber: 4 - MJ	2	2019	2	2019
Deliveries: Maritime Cyber: 5 - MJ	2	2020	2	2020
Deliveries: Maritime Cyber: 6 - MJ	2	2021	2	2021
Deliveries: Maritime Cyber: 7 - MJ	2	2022	2	2022
Deliveries: Maritime Cyber: 8-MJ	3	2023	3	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205601N *I Harm 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**
Total Program Element	778.962	32.889	87.989	120.762	-	120.762	116.451	79.958	60.215	61.506	Continuing	Continuing
1780: *HARM Improvement*	50.377	1.347	6.408	6.256	-	6.256	7.130	7.159	7.180	7.340	Continuing	Continuing
2185: *AARGM*	719.373	2.437	15.249	15.266	-	15.266	11.708	11.250	4.820	4.931	Continuing	Continuing
2189: *AARGM ER*	9.212	29.105	66.332	99.240	-	99.240	97.613	61.549	48.215	49.235	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 368												

A. Mission Description and Budget Item Justification

Research, Development, Test and Evaluation funding for the Joint Service Anti-Radiation Missile (ARM) program, which will include near and far term performance improvements, cost reduction, and studies that establish future development requirements. Specific initial efforts include lower cost seeker component development and seeker aided fuzing to enhance warhead performance in low angle impacts and against certain ship targets.

JUSTIFICATION FOR BUDGET ACTIVITY: These projects are funded under Operational Systems Development because they include 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. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	48.635	87.989	115.055	-	115.055
Current President's Budget	32.889	87.989	120.762	-	120.762
Total Adjustments	-15.746	0.000	5.707	-	5.707
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-4.500	0.000			
• SBIR/STTR Transfer	-1.046	0.000			
• Rate/Misc Adjustments	0.000	0.000	5.707	-	5.707
• Congressional Directed Reductions Adjustments	-10.200	-	-	-	-

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205601N *I Harm Improvement*

Change Summary Explanation

The FY 2019 funding request was reduced by $0.650 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 decrease of $1.143M due to change in inflation rates.

FY 2019 increase of $7.5M supports the Advanced Anti-Radiation Guided Missile Derivative Program (ADP) development.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*	Project (Number/Name) 1780 / *HARM 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
1780: *HARM Improvement*	50.377	1.347	6.408	6.256	-	6.256	7.130	7.159	7.180	7.340	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Anti-Radiation Missile (ARM) Improvement is a combination of the Navy led High Speed Anti-Radiation Missile (HARM) program and the Advanced Anti-Radiation Guide Missile (AARGM) program. The HARM program has undergone several Engineering Change Plans since ceasing production in 1983. Currently, the inventory consists of AGM-88B/C missiles with Block 5/A software which provides increased capability tracking emitters, improved targeting against a larger set of air defense related systems and improved seeker. HARM is a Navy led joint service program with the United States Air Force. AARGM is a program derived from a Small Business Innovative Research (SBIR) program that developed a dual mode guidance section, incorporating a Millimeter Wave (MMW) radar with an advance anti-radiation homing seeker. This provides the capability to counter shutdown of emitters. Additional capability for AARGM consists of Global Positioning System capability, MMW terminal guidance, netted targeting real time feed via Integrated Broadcast System (IBS), Weapon Impact Assessment (WIA), GPS point-to-point weapon engagement and impact avoidance zone/missile impact zones.

ARM Improvement efforts require periodic updates to the user data base based on changing threat parameters, enhanced air defense engagement tactics and emerging systems. These funds provide the opportunity to conduct ground and flight testing against foreign systems, called Foreign Material Assessment (FMA). The result of FMA is an analytical report on findings, updates to fleet tactics manuals, curriculum changes to the Suppression of Enemy Air Defenses / Destruction of Enemy Air Defenses lead Air Combat Training Curriculum course work and weapon school tactics/training and procedure briefs. FMA is focused on air defense weapon system and non-traditional target exploitation, analysis and subsequent integration and response to ensure the AGM-88 ARM weapon systems remains relevant in the planned operational 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: ARM Foreign Material Assessment (FMA)	1.347	6.408	6.256	0.000	6.256
Articles:	-	-	-	-	-
FY 2018 Plans: FMA activities will expand to include the AGM-88E Advanced Anti-Radiation Guided Missile (AARGM) in addition to the AGM-88B/C High-speed Anti-Radiation Missile (HARM). Increased funding will allow for FMA lab, ground, and flight test and evaluation activities to expand across the entire AGM-88 family of missiles to evaluate new and modern threat systems in order to update HARM and AARGM with capability to counter these threats. The funding also supports enhancement/upgrade to existing lab facilities to support the analysis of FMA results. The FMA team will continue to conduct FMA testing (both ground-based and captive flight testing), data analysis, and systems engineering to maximize AARGM and HARM effectiveness against threat air defense systems in FY 2018. The expanded capabilities of the AARGM from the legacy HARM will take advantage of the additional					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 1780 / *HARM Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
lab capabilities to compliment already existing HARM lab capabilities. This will enable digital Anti-Radiation Homing (ARH) seeker and MilliMeter Wave (MMW) terminal seeker assessment which are unique capabilities to AARGM. FMA assessments will remain focused on new threat systems as they become available for evaluation as well as theater/country-specific systems of interest. Priorities coordinated through the Fleet ARM Steering Committee. Expect continued testing and evaluation on advanced Surface-to-Air weapons and related IADS, jammers, and ARM countermeasures, and non-traditional ARM targets. Fleet engagement will continue as a key element of testing, engineering, and analytical efforts, which includes funding for threat assessment, operational updates, and integration efforts. Additional test priorities include characterizing complex systems in the field, so that FMA assessments can directly populate missile threat data libraries with updated attributes to enhance track quality for HARM and AARGM. Assess special projects developmental improvements against foreign material. ***FY 2019 Base Plans:*** The FMA team will continue to conduct FMA testing (both ground-based and captive flight testing), data analysis, and systems engineering to maximize AARGM and HARM effectiveness against threat air defense systems in FY 2019. The expanded capabilities of the AARGM from the legacy HARM will take advantage of the additional lab capabilities to compliment already existing HARM lab capabilities. This will enable digital Anti-Radiation Homing (ARH) seeker and MilliMeter Wave (MMW) terminal seeker assessment which are unique capabilities to AARGM. FMA assessments will remain focused on new threat systems as they become available for evaluation as well as theater/country-specific systems of interest. Priorities coordinated through the Fleet ARM Steering Committee. Expect continued testing and evaluation on advanced Surface-to-Air weapons and related IADS, jammers, and ARM countermeasures, and non-traditional ARM targets. Fleet engagement will continue as a key element of testing, engineering, and analytical efforts, which includes funding for threat assessment, operational updates, and integration efforts. Additional test priorities include characterizing complex systems in the field, so that FMA assessments can directly populate missile threat data libraries with updated attributes to enhance track quality for HARM and AARGM. Assess special projects developmental improvements against foreign material. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 decrease due to general program reductions.					
Accomplishments/Planned Programs Subtotals	1.347	6.408	6.256	0.000	6.256

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 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 1780 / *HARM Improvement*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

ARM system updates are provided through the System Support Activity (SSA) at Naval Air Warfare Center - Weapons Division (NAWCWD), China Lake, CA. ARM fleet priorities are set by the Fleet ARM Steering Committee.

E. Performance Metrics

Continue FMA testing and engineering analysis against new and evolving foreign threats.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*	Project (Number/Name) 1780 / *HARM 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
Systems Engineering	WR	NAWCWD : China Lake, CA	6.035	0.841	Nov 2016	1.752	Nov 2017	1.668	Nov 2018	-		1.668	Continuing	Continuing	Continuing
Systems Engineering	Various	Various : Various	0.000	0.000		0.300	Dec 2017	0.300	Dec 2018	-		0.300	0.000	0.600	-
Prior Year Prod Dev no longer funded in FYDP	Various	Various : Various	24.732	0.000		0.000		0.000		-		0.000	0.000	24.732	-
		Subtotal	30.767	0.841		2.052		1.968		-		1.968	Continuing	Continuing	N/A

Remarks

FY 2019 funding supports manpower required for data collection and analysis resulting from field testing.

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 & Eval	WR	NAWCWD : China Lake, CA	0.500	0.504	Nov 2016	4.164	Nov 2017	4.093	Nov 2018	-		4.093	Continuing	Continuing	Continuing
Operational Test & Eval	WR	NAWCWD : China Lake, CA	18.701	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	19.201	0.504		4.164		4.093		-		4.093	Continuing	Continuing	N/A

Remarks

FY 2019 funding supports field testing and Advanced Anti-Radiation Guided Missile lab capability investments to compliment already existing High Speed Anti-Radiation Missile lab 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	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.182	Nov 2017	0.185	Nov 2018	-		0.185	Continuing	Continuing	Continuing
Travel	WR	Various : Various	0.409	0.002	Jan 2017	0.010	Jan 2018	0.010	Jan 2019	-		0.010	Continuing	Continuing	Continuing
		Subtotal	0.409	0.002		0.192		0.195		-		0.195	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*	Project (Number/Name) 1780 / *HARM Improvement*	

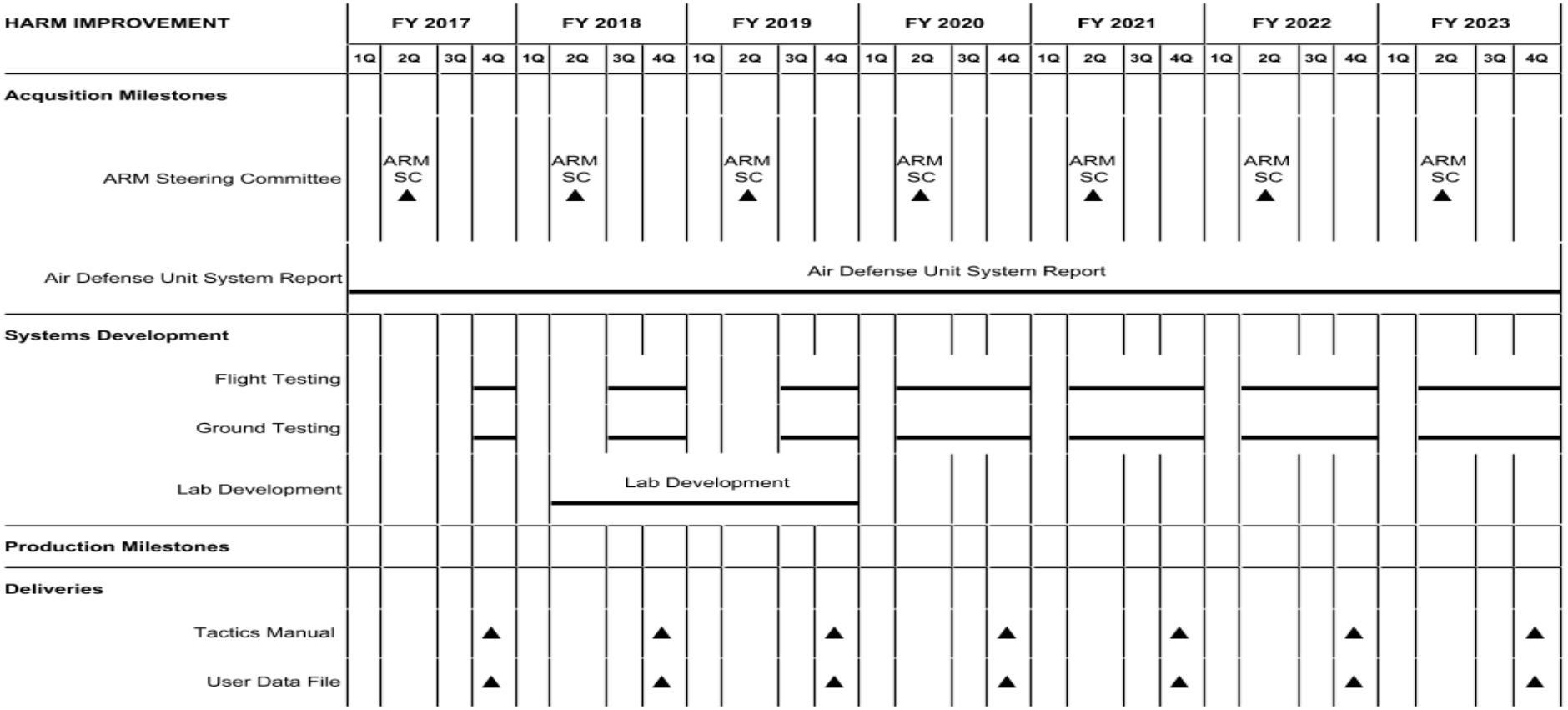
Management Services ($ in Millions)

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
Remarks															
Contract Type for Travel is Travel Order (TO).															

	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	50.377	1.347		6.408		6.256		-		6.256	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 1780 / *HARM Improvement*



2019DON - 0205601N - 1780

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 1780 / *HARM Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
HARM IMPROVEMENT				
Acqusition Milestones: ARM Steering Committee: FY17 ARM Steering Committee	2	2017	2	2017
Acqusition Milestones: ARM Steering Committee: FY18 ARM Steering Committee	2	2018	2	2018
Acqusition Milestones: ARM Steering Committee: FY19 ARM Steering Committee	2	2019	2	2019
Acqusition Milestones: ARM Steering Committee: FY20 ARM Steering Committee	2	2020	2	2020
Acqusition Milestones: ARM Steering Committee: FY21 ARM Steering Committee	2	2021	2	2021
Acqusition Milestones: ARM Steering Committee: FY22 ARM Steering Committee	2	2022	2	2022
Acqusition Milestones: ARM Steering Committee: FY23ARM Steering Committee	2	2023	2	2023
Acqusition Milestones: Air Defense Unit System Report: Air Defense Unit System Report	1	2017	4	2023
Systems Development: Flight Testing: Flight Testing FY17 QTR 4	4	2017	4	2017
Systems Development: Flight Testing: Flight Testing FY18 QTR 3-4	3	2018	4	2018
Systems Development: Flight Testing: Flight Testing FY19 QTR 3-4	3	2019	4	2019
Systems Development: Flight Testing: Flight Testing FY20 QTR 2-4	2	2020	4	2020
Systems Development: Flight Testing: Flight Testing FY21 QTR 2-4	2	2021	4	2021
Systems Development: Flight Testing: Flight Testing FY22 QTR 2-4	2	2022	4	2022
Systems Development: Flight Testing: Flight Testing FY23 QTR 2-4	2	2023	4	2023
Systems Development: Ground Testing: Ground Testing FY17 QTR 4	4	2017	4	2017
Systems Development: Ground Testing: Ground Testing FY18 QTR 3-4	3	2018	4	2018
Systems Development: Ground Testing: Ground Testing FY19 QTR 3-4	3	2019	4	2019
Systems Development: Ground Testing: Ground Testing FY20 QTR 2-4	2	2020	4	2020
Systems Development: Ground Testing: Ground Testing FY21 QTR 2-4	2	2021	4	2021
Systems Development: Ground Testing: Ground Testing FY22 QTR 2-4	2	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 1780 / *HARM Improvement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Ground Testing: Ground Testing FY23 QTR 2-4	2	2023	4	2023
Systems Development: Lab Development: Lab Development	2	2018	4	2019
Deliveries: Tactics Manual: Tactics Manual FY17	4	2017	4	2017
Deliveries: Tactics Manual: Tactics Manual FY18	4	2018	4	2018
Deliveries: Tactics Manual: Tactics Manual FY19	4	2019	4	2019
Deliveries: Tactics Manual: Tactics Manual FY20	4	2020	4	2020
Deliveries: Tactics Manual: Tactics Manual FY21	4	2021	4	2021
Deliveries: Tactics Manual: Tactics Manual FY22	4	2022	4	2022
Deliveries: Tactics Manual: Tactics Manual FY23	4	2023	4	2023
Deliveries: User Data File: User Data File FY17	4	2017	4	2017
Deliveries: User Data File: User Data File FY18	4	2018	4	2018
Deliveries: User Data File: User Data File FY19	4	2019	4	2019
Deliveries: User Data File: User Data File FY20	4	2020	4	2020
Deliveries: User Data File: User Data File FY21	4	2021	4	2021
Deliveries: User Data File: User Data File FY22	4	2022	4	2022
Deliveries: User Data File: User Data File FY23	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*				Project (Number/Name) 2185 / *AARGM*			
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**
2185: *AARGM*	719.373	2.437	15.249	15.266	-	15.266	11.708	11.250	4.820	4.931	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 368

A. Mission Description and Budget Item Justification

Advanced Anti-Radiation Guided Missile (AARGM) transitioned a Phase III Small Business Innovation Research (SBIR) program to develop and demonstrate a multi-mode guidance section on a High Speed Anti-Radiation Missile (HARM) airframe to System Development and Demonstration (SD&D) in FY 2003. The AARGM SD&D program was designed to integrate multi-mode guidance (passive Anti-Radiation Homing (ARH)/active Millimeter Wave (MMW) Radar/Global Positioning System (GPS)/ Inertial Navigation System) on the HARM Air-to-Ground Missile (AGM)-88. Planned AARGM weapon system capabilities include: active MMW terminal guidance, counter shutdown, expanded threat coverage, enhanced ARH, netted targeting real-time feed via Integrated Broadcast System (IBS) prior to missile launch, Weapon Impact Assessment (WIA) transmitted prior to detonation, GPS/point-to-point weapon navigation, enhanced navigational performance in denied environments and weapon employment with impact avoidance zone/missile impact zones.

The AARGM program includes 40 SD&D test articles with the follow on of 2,435 production modification kits. Milestone C was achieved 4Q FY 2008, followed by a combined FY 2008/FY 2009 Low Rate Initial Production (LRIP) contract award in 1Q FY 2009. Developmental testing was completed in 2009. Initial Operational Test and Evaluation (IOT&E) was completed in 3Q FY 2012. Full-Rate Production (FRP) decision was received 4 September 2012 with FRP contract award on 10 September 2012, and deliveries began in January 2014. The program remains in production through FY 2023.

The AARGM Block 1 Upgrade program began in FY 2012 and consists of a software only upgrade to deferred Key Performance Parameter 3 and to correct IOT&E deficiencies in the AGM-88E All-Up-Round as well as the Common Munitions Built-in Test (BIT) Reprogramming Equipment (CMBRE).

Follow-on Operational Test and Evaluation/Integrated Test (FOT&E/IT) of the Block 1 Upgrade completed with Fleet Release approval in July 2017 and completion in January 2018.

In FY 2019 - FY 2023, the AARGM program plans to develop and demonstrate the capability to engage and destroy non-traditional and Overseas Contingency Operations targets. These developments continue Future Naval Capability Science and Technology investments by the Office of Naval Research initiated in FY 2006. Over this same timeframe, the AARGM program will develop or enhance navigational capability in denied environments.

FY 2019 funding supports AARGM's advanced development and system capability upgrades. Additional funding will support the implementation of M Code, AARGM Derivative Program and upgrades to the radio frequency data processing to meet emerging requirements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2185 / *AARGM*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Threat Data Library / System Updates	0.410	2.230	1.200	0.000	1.200
Articles:	-	-	-	-	-
FY 2018 Plans: AGM-88E continues effort to upgrade systems such as the Electronic Intelligence files and Millimeter Wave signatures to identify, track and engage new and/or improved threat radars. Continue test and assessment of threat systems that impact already fielded weapons and to develop threat data for new target sets. Plans also include development or enhancement of navigational capability, integration of modernized Anti-Radiation Homing processor, and human system interface improvements to mission planning.					
FY 2019 Base Plans: AGM-88E continues effort to upgrade and prioritize Electronic Intelligence files. Continue test and assessment of threat systems that impact already fielded weapons and to develop threat data for new target sets. Plans also include development or enhancement of navigational capability, integration of modernized Anti-Radiation Homing processor, and human system interface improvements to mission planning.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 reduction in AARGM Threat Data Library / System Updates.					
Title: Follow-on Operational Test and Evaluation (FOT&E) and Correction of Deficiencies	1.077	0.475	0.484	0.000	0.484
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to upgrade the system with test results to include developmental activity assessing software and hardware anomalies. Includes verification and validation for correction of deficiencies from Block 0 and Block 1 testing.					
FY 2019 Base Plans: Continue to upgrade the system with test results to include developmental activity assessing software and hardware anomalies. Testing for those efforts in System Updates includes navigational T&E, processor performance evaluations, and includes verification and validation for correction of deficiencies from Block 0 and Block 1 testing.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2185 / *AARGM*

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 increase due to continued execution of AARGM FOT&E and Correction of Deficiencies plans.					
Title: Advanced Development	0.950	12.544	13.582	0.000	13.582
Articles:	-	-	-	-	-
FY 2018 Plans: Enhance navigational capability to comply with requirement to implement M Code to comply with U.S. Statute. Funding added in PB18 specifically addresses the effort to upgrade radio frequency data processing to meet emerging requirements. Funding supports the transition of receiver technology upgrades in coordination with the Office of Naval Research (ONR). This project was initiated in FY 2016 which upgrades the AARGM capability for detection of high priority, non-traditional targets. The Technology Transition Agreement (TTA) requires the program to fund the integration of the design which consists of software development and hardware integration. Funding supports testing, configuration control board review, test plan reviews, requirements analysis and weapons integration analysis. Funding also supports upgrading AGM-88E capability against non-traditional and OCO targets. This includes weapon system developmental activities, range and laboratory support and analysis. ***FY 2019 Base Plans:*** Enhance navigational capability to comply with requirement to implement M Code to comply with U.S. Statute. Award the M Code Integration & Test contract. Funding supports upgrade of the radio frequency data processing to meet emerging requirements. Funding supports the transition of receiver technology upgrades in coordination with the Office of Naval Research (ONR) project ALPO. Funding supports testing, configuration control board review, test plan reviews, requirements analysis and weapons integration analysis. Funding supports upgrading AGM-88E capability against non-traditional and OCO targets. This includes weapon system developmental activities, range and laboratory support and analysis. In FY 2019, the AARGM program plans to develop and demonstrate the capability to engage and destroy non-traditional and Overseas Contingency Operations targets. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increase to fund the AARGM Derivative Program and M Code requirements.					
Accomplishments/Planned Programs Subtotals	2.437	15.249	15.266	0.000	15.266

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2185 / *AARGM*

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 2327: *HARM Mods*	180.052	183.368	187.985	-	187.985	183.880	187.962	175.427	178.998	0.000	1,927.931

Remarks

FY 2021 - FY 2023 Total Cost funding listed does not include the Advanced Anti-Radiation Guided Missile Extended Range funding.

D. Acquisition Strategy

The AARGM program started as a Phase I Small Business Innovative Research (SBIR), Advanced Technology Program, evolved into a Phase III SBIR program, and transitioned into a System Development and Demonstration (SD&D) Acquisition Category 1C program in June 2003. The AARGM SD&D met most U.S. Navy operational requirements. AARGM Advanced Technology Development and Quick Bolt Advanced Concept Technology Demonstration demonstrated possible future system enhancements. AARGM Block 1 fulfills the rest of the operational requirements. Block 1 Fleet Release approval 4Q FY2017. ONR Future Naval Capability AARGM Derivative Program (ADP) Program to transition in FY2019. Expand target set capability and add M-code in FY2018 - FY2023.

E. Performance Metrics

Block 1 Fleet Release complete 2Q FY2018. ADP Transition FY2019. M-Code capable FY2021. ADP and Complex Emitter Capable FY2022.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*	Project (Number/Name) 2185 / *AARGM*	

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	Orbital ATK : Northridge, CA	0.000	0.000		9.500	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : China Lake, CA	82.320	1.152	Nov 2016	2.055	Nov 2017	1.016	Nov 2018	-		1.016	Continuing	Continuing	Continuing
M Code	SS/IDIQ	Orbital ATK : Northridge, CA	0.000	0.000		1.000	Mar 2018	3.200	Jan 2019	-		3.200	Continuing	Continuing	Continuing
Software Development	SS/IDIQ	Orbital ATK : Northridge, CA	0.000	0.000		1.026	Mar 2018	9.473	Dec 2018	-		9.473	Continuing	Continuing	Continuing
Mission Planning	WR	Various : Various	0.733	0.100	Mar 2017	0.100	Mar 2018	0.100	Mar 2019	-		0.100	Continuing	Continuing	Continuing
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	544.279	0.000		0.000		0.000		-		0.000	0.000	544.279	-
		Subtotal	627.332	1.252		13.681		13.789		-		13.789	Continuing	Continuing	N/A

Remarks

FY 2019 M Code funding required to support implementation of M Code. FY 2019 Software Development funding planned to support Radio Frequency (RF) Processor firmware, RF Processor software, A2 Card firmware, the transition of the ONR Future Naval Capability Project Alpo into the program of record AARGM Derivative Program (ADP) and Missile Software (Block 1A) development 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
Prior year Support no longer funded in the FYDP	Various	Various : Various	7.147	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	7.147	0.000		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
Development Test & Evaluation	WR	NAWCWD : China Lake, CA	26.433	0.000		0.528	Nov 2017	0.429	Nov 2018	-		0.429	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*	Project (Number/Name) 2185 / *AARGM*	

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	SS/IDIQ	Orbital ATK : Northridge, CA	5.739	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	JITC : Fort Huachuca, AZ	0.000	0.006	Feb 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational and Integrated Test & Evaluation (IT&OT))	WR	NAWCWD : China Lake, CA	12.714	0.058	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational and Integrated Test & Evaluation (IT&OT))	WR	COMOPTEVFOR : Norfolk, VA	11.670	0.045	Nov 2016	0.000		0.000		-		0.000	0.000	11.715	-
Operational and Integrated Test & Evaluation (IT&OT))	SS/IDIQ	Orbital ATK : Northridge, CA	1.342	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior year T&E no longer funded in the FYDP	Various	Various : Various	7.469	0.000		0.000		0.000		-		0.000	0.000	7.469	-
		Subtotal	65.367	0.109		0.528		0.429		-		0.429	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	Various	Various : Various	4.840	0.296	Feb 2017	0.250	Feb 2018	0.250	Feb 2019	-		0.250	Continuing	Continuing	Continuing
Travel	WR	NAVAIR HQ : Patuxent River, MD	1.738	0.040	Feb 2017	0.015	Feb 2018	0.015	Feb 2019	-		0.015	Continuing	Continuing	Continuing
Government Engineering Support	WR	NAWC AD : Patuxent River, MD	2.199	0.440	Nov 2016	0.575	Nov 2017	0.583	Nov 2018	-		0.583	Continuing	Continuing	Continuing
Program Management Support	Various	NRO : Washington, D.C.	0.500	0.300	Nov 2016	0.200	Nov 2017	0.200	Nov 2018	-		0.200	Continuing	Continuing	Continuing
Prior year Mgmt no longer funded in the FYDP	Various	Various : Various	10.250	0.000		0.000		0.000		-		0.000	0.000	10.250	-
		Subtotal	19.527	1.076		1.040		1.048		-		1.048	Continuing	Continuing	N/A

Remarks

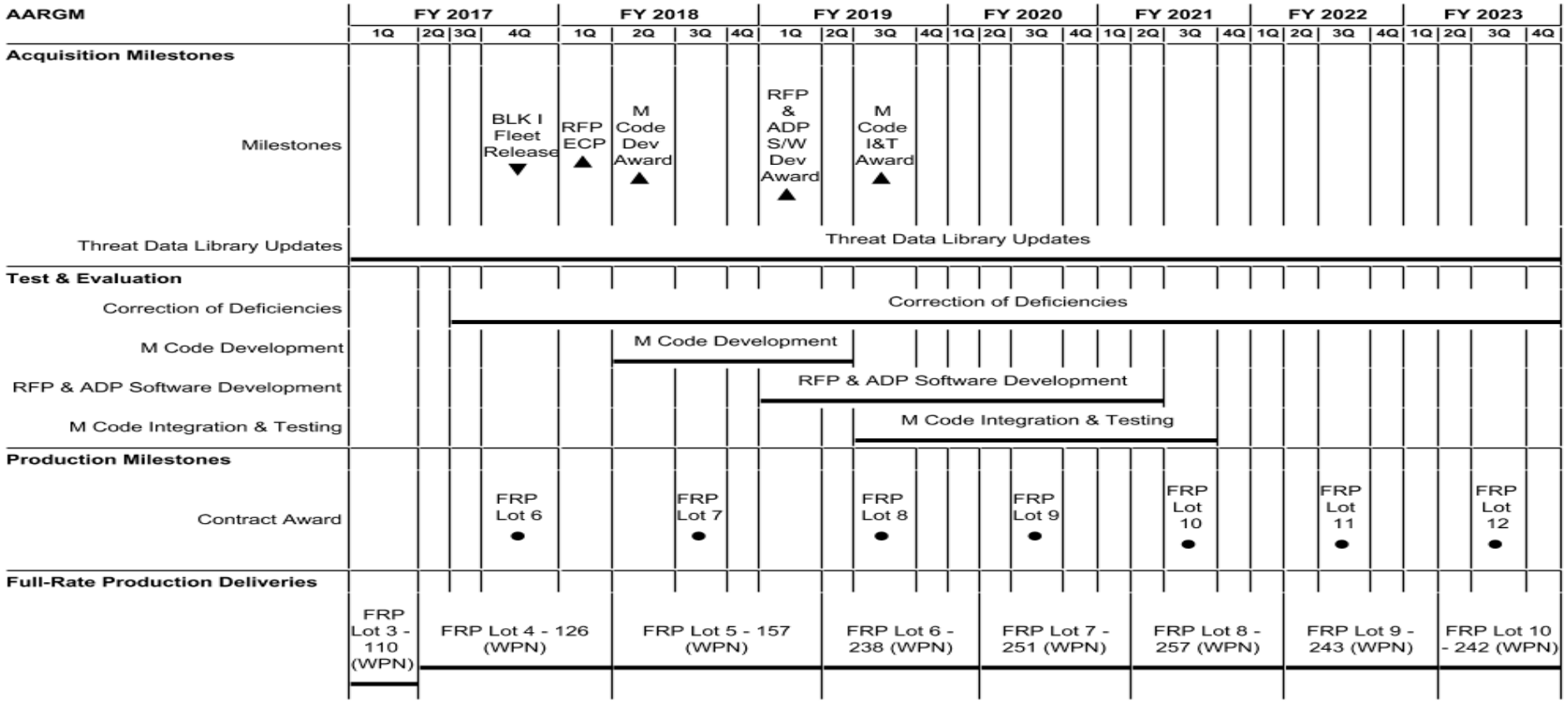
Contract Type for Travel is TO

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*	Project (Number/Name) 2185 / *AARGM*	

	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	719.373	2.437		15.249		15.266		-		15.266	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2185 / *AARGM*



2019PB - 0205601N - 2185

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2185 / *AARGM*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AARGM				
Acquisition Milestones: Milestones: BLOCK 1 Fleet Release	4	2017	4	2017
Acquisition Milestones: Milestones: Radio Frequencey Processor Upgrade	1	2018	1	2018
Acquisition Milestones: Milestones: M Code Dev Award	2	2018	2	2018
Acquisition Milestones: Milestones: RFP & ADP S/W Dev Award	1	2019	1	2019
Acquisition Milestones: Milestones: M Code I&T Award	3	2019	3	2019
Acquisition Milestones: Threat Data Library Updates: Threat Data Library Updates	1	2017	4	2023
Test & Evaluation: Correction of Deficiencies: Correction of Deficiencies	3	2017	4	2023
Test & Evaluation: M Code Development: M Code Development	2	2018	2	2019
Test & Evaluation: RFP & ADP Software Development: RFP & ADP Software Development	1	2019	2	2021
Test & Evaluation: M Code Integration & Testing: M Code Integration & Testing	3	2019	3	2021
Production Milestones: Contract Award: Full-Rate Production Lot 6	4	2017	4	2017
Production Milestones: Contract Award: Full-Rate Production Lot 7	3	2018	3	2018
Production Milestones: Contract Award: Full-Rate Production Lot 8	3	2019	3	2019
Production Milestones: Contract Award: Full-Rate Production Lot 9	3	2020	3	2020
Production Milestones: Contract Award: Full-Rate Production Lot 10	3	2021	3	2021
Production Milestones: Contract Award: Full-Rate Production Lot 11	3	2022	3	2022
Production Milestones: Contract Award: Full-Rate Production Lot 12	3	2023	3	2023
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 3 (WPN)	1	2017	1	2017
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 4 (WPN)	2	2017	1	2018
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 5 (WPN)	2	2018	1	2019
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 6 (WPN)	2	2019	1	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2185 / *AARGM*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 7 (WPN)	2	2020	1	2021
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 8 (WPN)	2	2021	1	2022
Full-Rate Production Deliveries: Full-Rate Production Delieveries - Lot 9 (WPN)	2	2022	1	2023
Full-Rate Production Deliveries: Full-Rate Production Deliveries - Lot 10 (WPN)	2	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*				Project (Number/Name) 2189 / *AARGM ER*			
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**
2189: *AARGM ER*	9.212	29.105	66.332	99.240	-	99.240	97.613	61.549	48.215	49.235	Continuing	Continuing
Quantity of RDT&E Articles		-	-	15	-	15	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air-to-Ground (AGM)-88E Extended Range (ER) Upgrade was a new start in FY 2016. The purpose of this effort is to develop hardware and software modifications to improve the Advanced Anti-Radiation Guided Missile (AARGM)'s operational capabilities, including extended range, survivability and effectiveness against complex, new, and emerging threats. This budget line item funds a new rocket motor design, system development and integration, test asset procurement, testing, and associated software updates for the AARGM-ER to ensure these capabilities perform in accordance with established requirements. FY 2019 activities include the Engineering & Manufacturing Development (EMD) phase and procurement of test articles. AARGM-ER retains the same guidance, sensor, and warhead capabilities of the AARGM.

The AARGM-ER 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 allows the U.S. Navy to operate in, and control, contested battle space in littoral waters and A2/AD environments are increasingly critical as more scenarios require compressed and coordinated fire control timelines.

AARGM-ER is a capability based acquisition program and has been structured to meet the CNO's urgency mandate to deliver warfighting capability as soon as possible.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: AARGM ER Development	29.105	66.332	99.240	0.000	99.240
Articles:	-	-	15	-	15
FY 2018 Plans: Completion of the Front End Design Analysis and Rocket Motor Risk Initiative. Award of the Missile Section Integration contract. Execute Knowledge Point 2. Continue range safety analysis for telemetry section Flight Termination System development.					
FY 2019 Base Plans: FY 2019 activities include completion of the Missile Section Integration contract and contract award for the Engineering & Manufacturing Development phase to include procurement of test articles. Continue range safety analysis for telemetry section Flight Termination System development. Funding supports upgrading capability					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2189 / *AARGM ER*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
to process and target non-traditional and advanced signals. This includes weapon system developmental activities, range and laboratory support and analysis. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY2019 increase due to execution and completion of the Missile Section Integration contract and award of the Engineering and Manufacturing Development contract to include development of fifteen AARGM-ER test articles.					
Accomplishments/Planned Programs Subtotals	29.105	66.332	99.240	0.000	99.240

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 2327: *HARM Mods*	0.000	0.000	0.000	-	0.000	0.000	30.000	30.662	31.275	116.508	208.445

Remarks

FY 2021 and Total Cost funding listed does not include the AARGM Block 1 funding.

D. Acquisition Strategy

The AARGM Extended Range Program will provide hardware and software modifications to improve AARGM's operational capabilities, including extended range, survivability, and effectiveness against complex, new, emerging threats. The program's threshold requirement for Initial Operational Capability is FY 2023.

E. Performance Metrics

AARGM-ER activities to support a Knowledge Point 2 in FY 2018.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2189 / *AARGM ER*

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
Rocket Motor Risk Initiative	WR	NAWCWD : China Lake, CA	0.000	0.447	Jan 2017	0.500	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Rocket Motor Risk Initiative	WR	NSWC : Indian Head, MD	0.000	0.500	Dec 2016	0.500	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Front End Design Analysis	SS/CPFF	Orbital ATK : Northridge, CA	2.991	10.104	Feb 2017	2.044	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Missile Section Integration	SS/CPFF	Orbital ATK : Northridge, CA	0.000	6.578	Nov 2017	51.079	Jan 2018	2.030	Oct 2018	-		2.030	Continuing	Continuing	Continuing
Engineering & Manufacturing Development	TBD	Orbital ATK : Northridge, CA	0.000	0.000		0.000		56.442	Dec 2018	-		56.442	Continuing	Continuing	Continuing
Aircraft Integration	Various	Various : Various	0.680	0.204	Mar 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCWD : China Lake, CA	2.652	5.425	Nov 2016	5.907	Nov 2017	6.146	Nov 2018	-		6.146	Continuing	Continuing	Continuing
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.461	1.005	Nov 2016	1.322	Nov 2017	1.348	Nov 2018	-		1.348	Continuing	Continuing	Continuing
Telemetry Section	WR	NAWCWD : China Lake, CA	0.100	0.100	Dec 2016	0.204	Nov 2017	3.384	Nov 2018	-		3.384	Continuing	Continuing	Continuing
		Subtotal	6.884	24.363		61.556		69.350		-		69.350	Continuing	Continuing	N/A

Remarks

FY 2019 activities include execution of the Development & Integration phase.

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	Various	Various : Various	0.859	2.747	Apr 2017	2.100	Nov 2017	0.500	Mar 2019	-		0.500	Continuing	Continuing	Continuing
		Subtotal	0.859	2.747		2.100		0.500		-		0.500	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205601N / *Harm Improvement*	Project (Number/Name) 2189 / *AARGM ER*	

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		0.500	Nov 2017	1.550	Nov 2018	-		1.550	Continuing	Continuing	Continuing
ER Test Assets	TBD	Orbital ATK : Northridge, CA	0.000	0.000		0.000		25.500	Dec 2018	-		25.500	Continuing	Continuing	Continuing
T&E Support	WR	COTF : Norfolk, VA	0.000	0.050	Jul 2017	0.100	Jan 2018	0.200	Nov 2018	-		0.200	0.000	0.350	-
Operational and Integrated T&E	WR	Various : Various	0.000	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.000	0.050		0.600		27.250		-		27.250	Continuing	Continuing	N/A

Remarks

FY 2019 activities include the procurement of test assets as part of the Development & Integration contract.

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	Various	Various : Various	0.747	0.916	Nov 2016	0.996	Nov 2017	1.020	Nov 2018	-		1.020	Continuing	Continuing	Continuing
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.711	0.986	Nov 2016	1.005	Nov 2017	1.025	Nov 2018	-		1.025	Continuing	Continuing	Continuing
Government Engineering & Information Technology Support	WR	NSWC : Dahlgren, VA	0.003	0.034	Oct 2016	0.035	Oct 2017	0.035	Oct 2018	-		0.035	Continuing	Continuing	Continuing
Travel	WR	NAVAIR HQ : Patuxent River, MD	0.008	0.009	Nov 2016	0.040	Nov 2017	0.060	Nov 2018	-		0.060	Continuing	Continuing	Continuing
		Subtotal	1.469	1.945		2.076		2.140		-		2.140	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	9.212	29.105		66.332		99.240		-		99.240	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2189 / *AARGM ER*

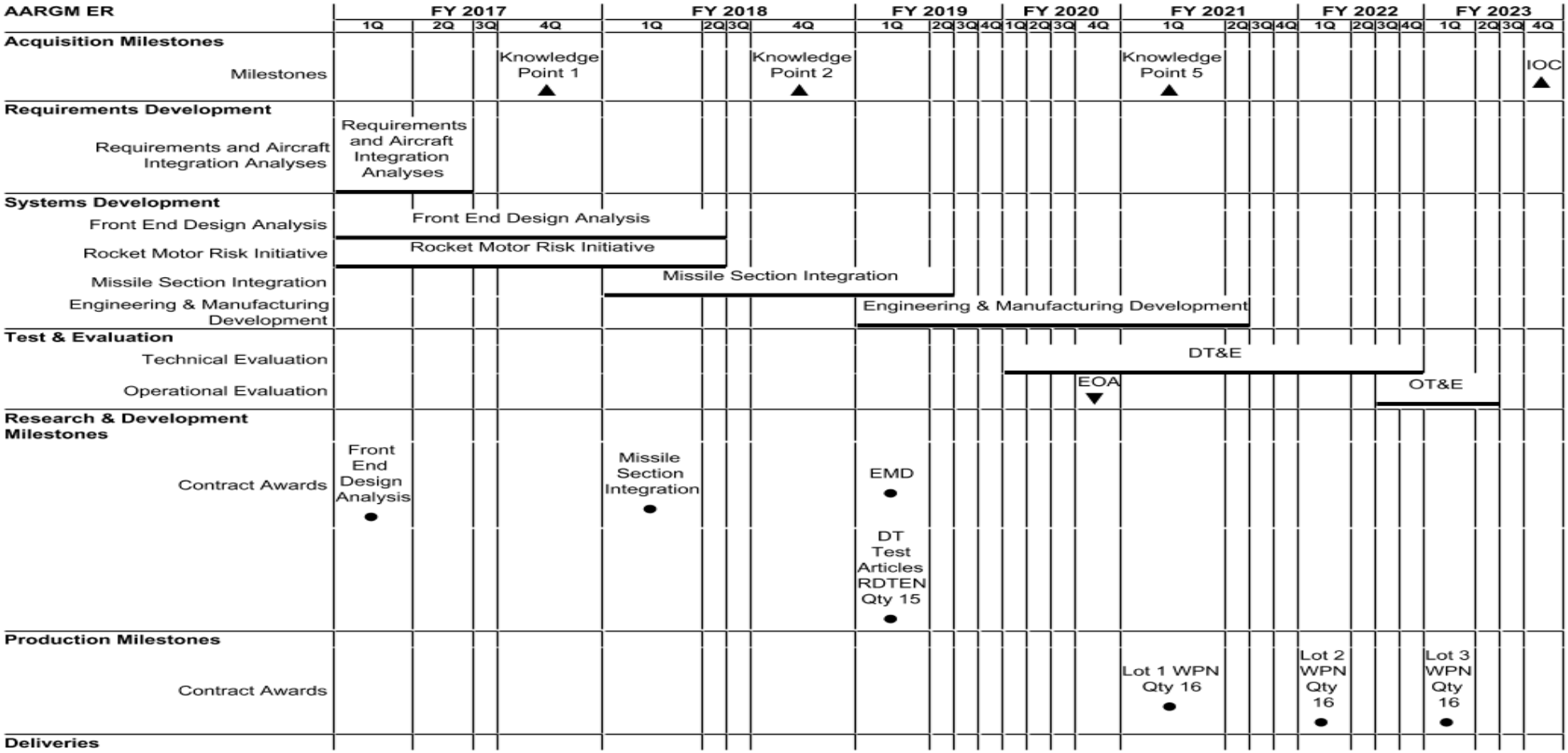


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2189 / *AARGM ER*

2019PB - 0205601N - 2189

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2189 / *AARGM ER*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AARGM ER				
Acquisition Milestones: Milestones: Knowledge Point 1	4	2017	4	2017
Acquisition Milestones: Milestones: Knowledge Point 2	4	2018	4	2018
Acquisition Milestones: Milestones: Knowledge Point 5	1	2021	1	2021
Acquisition Milestones: Milestones: IOC	4	2023	4	2023
Requirements Development: Requirements and Aircraft Integration Analyses: Requirements and Aircraft Integration Analyses	1	2017	2	2017
Systems Development: Front End Design Analysis: Front End Design Analysis	1	2017	2	2018
Systems Development: Rocket Motor Risk Initiative: Rocket Motor Risk Initiative	1	2017	2	2018
Systems Development: Missile Section Integration: Missile Section Integration	1	2018	2	2019
Systems Development: Engineering & Manufacturing Development: Engineering & Manufacturing Development	1	2019	2	2021
Test & Evaluation: Technical Evaluation: Developmental Test & Evaluation	1	2020	4	2022
Test & Evaluation: Operational Evaluation: Early Operational Assessment	4	2020	4	2020
Test & Evaluation: Operational Evaluation: Operational Test & Evaluation	3	2022	2	2023
Research & Development Milestones: Contract Awards: Front End Design Analysis	1	2017	1	2017
Research & Development Milestones: Contract Awards: Missile Section Integration	1	2018	1	2018
Research & Development Milestones: Contract Awards: Engineering & Manufacturing Development	1	2019	1	2019
Research & Development Milestones: Contract Awards: DT Test Articles RDTEN Qty 15	1	2019	1	2019
Production Milestones: Contract Awards: Lot 1 WPN Qty 16	1	2021	1	2021
Production Milestones: Contract Awards: Lot 2 WPN Qty 16	1	2022	1	2022
Production Milestones: Contract Awards: Lot 3 WPN Qty 16	1	2023	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205601N / *Harm Improvement*	**Project (Number/Name)** 2189 / *AARGM ER*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: DT Test Articles Qty 15	3	2020	2	2021
Deliveries: Lot 1 WPN Qty 16	3	2022	2	2023
Deliveries: Lot 2 WPN Qty 16	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205604N *I Tactical Data Links*							
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	1,067.663	121.396	89.852	104.696	-	104.696	101.709	80.349	49.297	53.325	Continuing	Continuing
2126: *ATDLS Integration*	759.134	37.232	23.338	31.295	-	31.295	23.800	20.756	20.007	23.447	Continuing	Continuing
3020: *MIDS/JTRS*	250.992	55.601	50.285	59.515	-	59.515	28.765	23.304	23.080	23.535	Continuing	Continuing
3341: *Network Tactical Common Data Link*	57.537	28.563	16.229	13.886	-	13.886	49.144	36.289	6.210	6.343	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 554												

A. Mission Description and Budget Item Justification

Tactical Data Link (TDL) systems includes the Advanced Tactical Data Link Systems (ATDLS) integration programs, specifically Link 16 Network, Command and Control Processor (C2P) and Link Monitoring and Management Tool (LMMT); and Network Tactical Common Data Link (NTCDL) Program which provides the ability to transmit/ receive real-time intelligence, surveillance, and reconnaissance (ISR) data simultaneously from multiple sources (surface, air, sub-surface, man-portable), and exchange command and control information (voice, data, imagery, and full motion video (FMV)) across dissimilar joint, service, coalition, and civil networks. The program element also develops and tests tactical data link capability to distribute other data types to new and existing platforms.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under operational systems development because it encompasses engineering and manufacturing development for upgrade of existing operational systems.

Network Tactical Common Data Link (NTCDL) provides the ability to transmit/receive real-time intelligence, surveillance, and reconnaissance (ISR) data simultaneously from multiple sources (air, surface, sub-surface, and man-portable) and exchange command and control information (voice, data, imagery, and full-motion video) across dissimilar joint, service, coalition, and civil networks. NTCDL provides warfighters the capability to support multiple, simultaneous, networked operations with in-service Common Data Link (CDL) equipped aircraft (e.g., F/A-35, P-3, and MH- 60R) in addition to next-generation manned and unmanned platforms (e.g., P-8 Poseidon, Triton, MQ-25 (Stingray), small tactical unmanned aircraft systems (STUAS), and Fire Scout).

Network Tactical Common Data Link (NTCDL) High Capacity Backbone (HCB) efforts support Joint Aerial Layer Network-Maritime (JALN-M) System of Systems development, integration, and testing. JALN-M is the Navy implementation of the JALN architecture which provides assured communications in an Anti-Access/Area Denial (A2/AD) environment. With disruption or loss of Space tier communications, JALN-M establishes and/or restores connectivity with the HCB tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability.

Link 16 Network Program provides high power shipboard and shore integrated Link 16 capability through the fielding of Joint Tactical Information Distribution System (JTIDS), Multifunctional Information Distribution System (MIDS) on Ships (MOS) and MOS Modernization (MOS Mod) including transmit and receive antennas and High

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*

Power Amplifiers (HPA). JTIDS, MOS and MOS Mod utilizes the JTIDS, MIDS Low Volume Terminal (LVT), and MIDS Joint Tactical Radio System (JTRS) terminals respectively, integrates the HPA and interfaces to the shipboard antenna and Command and Control Processor (C2P). MIDS-LVT and MIDS JTRS terminals are developed by the MIDS Program Office. JTIDS terminal is no longer in production, but is undergoing product improvement to maintain interoperability and security with MIDS-LVT and MIDS JTRS. As part of the product improvement all shipboard Link 16 terminals are required to have dynamic network management (DNM), crypto modernization (CM) and frequency remapping (FR). MIDS Program Office is developing additional improvements to the MIDS-LVT and MIDS JTRS terminals. The MIDS-LVT will have Link 16 Enhanced Throughput (ET) and the MIDS JTRS will have the added capability of four net concurrent multi-netting (CMN) with current contention receive (CCR) and tactical targeting networking technology (TTNT).

The Multifunctional Information Distribution System (MIDS) program office is the Lead Service for Department of Defense (DOD) Link 16 capability and consists of two (2) product lines, MIDS Low Volume Terminal (LVT) (legacy hardware defined radio) and MIDS Joint Tactical Radio System (JTRS) (software defined radio). MIDS-LVT provides Link 16 capability to platforms that were unable to employ Joint Tactical Information Distribution System due to space and weight constraints. The MIDS-LVT effort is a cooperative development program between France, Germany, Italy, Spain, and the United States with United States joint service participation (Navy, Army, Air Force), and has provided over 11,000 terminals to 48 Nations providing interoperability with North Atlantic Treaty Organization (NATO) and coalition partners. The Department of Defense (DoD) established the program to design, develop, and deliver low volume, lightweight tactical information system terminals for U.S. and Allied fighter aircraft, bombers, helicopters, ships, and ground sites. MIDS-LVT significantly increases force effectiveness and minimizes hostile actions and friend-on-friend engagements. The current development program for LVT is the Block Upgrade 2 effort designed to meet the Cryptographic Modernization (CM) and Frequency Remapping (FR) mandates required for all US and international users which occurs inside the FYDP. The terminal design is smaller, lighter, highly reliable, interoperable with Joint Tactical Information Distribution System (JTIDS) Class 2 terminal, compatible with all the participants' designated platforms, affordable, and re-configurable to individual user needs and budgets.

MIDS JTRS, designed as a Pre-Planned Product Improvement (P3I) and executed as an Engineering Change Proposal (ECP) to the production MIDS-LVT configuration, completed qualification in the first quarter of fiscal year 2010. It facilitated the JTRS incremental approach for fielding advanced JTRS transformational networking capability and transformed the MIDS-LVT into a 4-channel, Software Communications Architecture (SCA) compliant, Joint Tactical Radio. A form-fit-function replacement to MIDS-LVT, MIDS JTRS also adds three programmable 2 Megahertz (MHz) to 2 Gigahertz (GHz) channels capable of hosting the JTRS legacy and networking waveforms. In addition to Link 16, Tactical Air Navigation, and voice functionality found in MIDS-LVT, MIDS JTRS has four channels and adds capabilities such as Link 16 Enhanced Throughput, Link 16 Frequency Re-mapping, software programmability, Cryptographic Modernization, and Four Net Concurrent Multi-Netting with Concurrent Contention Receive (CMN-4). MIDS Modernization Increment 2 is a specific and distinct effort that will transform the MIDS JTRS radio to a true software defined radio allowing rapid technology insertion, in the field, to outpace the threat including software updates for maintenance, reliability, security, cyber, interoperability and capacity. MIDS Modernization Increments 3 and follow on efforts have yet to be funded, but are currently in the design stages. MIDS Modernization Increment 1 will be fielded with all MIDS JTRS CMN4 terminals.

The TTNT waveform is the next waveform to be added to the MIDS JTRS terminal. TTNT is a low latency, high throughput waveform that has the capability to support data exchange between fast-moving tactical aircraft, weapons, and unmanned aircraft, in addition to air, land, and sea-based command and control nodes, in a variety of air-to-air and air-to-ground missions including time sensitive targeting, air warfare, close air support, non-traditional ISR, and anti-surface warfare. TTNT capability integration into the MIDS JTRS directly supports Naval Integrated Fire Control - Counter Air From-The-Air (NIFC-CA FTA) capability requirements. These capabilities

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205604N *I Tactical Data Links*

provide Joint Airborne Network-Tactical Edge functionality to run advanced mission applications in a cross-platform/cross-domain tactical network enterprise, the TTNT capability will be in addition to the CMN-4 terminal providing Link 16 capability, and the ability to simultaneously participate in four Link 16 Nets.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	124.785	89.852	111.709	-	111.709
Current President's Budget	121.396	89.852	104.696	-	104.696
Total Adjustments	-3.389	0.000	-7.013	-	-7.013
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.121	0.000			
• Program Adjustments	0.000	0.000	-6.000	-	-6.000
• Rate/Misc Adjustments	0.000	0.000	-1.013	-	-1.013
• Congressional General Reductions Adjustments	-0.268	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($0.607) 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 2019 funding request was reduced by $14.9 million to account for the availability of prior year execution balances.

Advanced Tactical Data Link Systems ATDLS (2126): RDT&E budget requirement increased from FY18 to FY19 due to the acceleration of Link 16 MOS Modernization on AEGIS Ships.

Link 16 Network Increment II Cryptographic Modernization (CM)/Frequency Remapping (FR) (2126): As a result in delays in MIDS LVT BU2 development and qualification, the MOS CM/FR/TRR has been delayed. As a result of delays in completing JTIDS Electromagnetic Compatibility (EMC) Certification, JTIDS development delays and MIDS LVT development to support shipboard integration, JTIDS CM/FR and MOS CM/FR Operational Test and Fielding Decision Reviews FDR have been delayed. Developmental Test (DT) nomenclature has been replaced with Integrated Test (IT) due to revision in test strategy to include Commander Operation Test Force (COTF) participation prior to OT.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205604N *I Tactical Data Links*

Link 16 Network Increment II MOS Modernization (2126): As a result of delays to correct deficiencies found in the government furnished equipment and MOS Mod system, MOS MOD Integrated Test (formerly Developmental Test), Operational Test and Fielding Decision Review FDR has been delayed. MOS MOD FDR was additionally delayed to allow sufficient time to complete Operational Test (OT) report and prepare for FDR. Developmental Test (DT) nomenclature has been replaced with Integrated Test (IT) due to revision in test strategy to include Commander Operation Test Force (COTF) participation prior to OT. Added MOS Mod with MIDS JTRS CMN Terminal development test to validate the MIDS JTRS CMN terminal integration into shipboard environment. Added Concurrent Multi Netting (CMN) developmental test to validate the CMN function integration into shipboard environment.

Link Monitoring and Management Tool (LMMT) (2126): LMMT Capability Drop (CD) 2 Fielding Technical Review (FTR) and Fielding Decision Review (FDR) delayed by one quarter due to Developmental Testing/Operational Testing (DT/OT) availability. In addition, LMMT CD 3 Design and Development schedule delayed by one year to allow for stability and refinement of Link 22 requirements.

MIDS (3020):
MIDS RDTE increases from FY18 to FY19 due to the DoD directed rapid insertion of Link 16 technologies into the MIDS JTRS Four Net Concurrent Multi-Netting with Concurrent Contention Receive (CMN-4) Terminal (MIDS Modernization). Additional MIDS Modernization information is available at the Program Office in a Classified setting.

MIDS JTRS CMN-4 is now conducting an Operational Assessment (OA) in 3Q18. The ability to combine flight tests with other platform testing enabled MIDS JTRS CMN-4 IOC to be moved to 3Q18 after the OA. MIDS JTRS TTNT First Article Qualification Testing updated to complete in FY19.

NTCDL (3341):
Network Tactical Common Data Link (NTCDL): The FY 2019 funding request was reduced by $10 million to account for the availability of prior year execution balances.

FY19 request is for NTCDL product development, to include continued development of two (2) NTCDL Engineering Development Models (EDMs) and associated software. The FY 2019 funding decrease of $10M will delay Government Furnished Software (GFS) development, contractor-developed software, EDM development, and systems engineering efforts resulting in a fifteen month delay for EDM delivery from FY20 to FY22. Joint Strike Fighter (JSF) F-35B/C requires NTCDL for Common Data Link (CDL) interoperability as the legacy shipboard CDL system does not support the JSF CDL capability. The fifteen month delay in NTCDL development will significantly impact F-35's mission capability, as the aircraft will not be able to transmit Intelligence, Surveillance, and Reconnaissance (ISR) data to the ship.

The NTCDL Engineering Development Model (EDM) Contract was awarded Sep 2016 and subsequently protested. Contract was re-awarded June 2017.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 2126 / *ATDLS 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
2126: *ATDLS Integration*	759.134	37.232	23.338	31.295	-	31.295	23.800	20.756	20.007	23.447	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and improves the Navy's Tactical Data Link (TDL) systems. It includes the Advanced Tactical Data Link Systems (ATDLS) Integration Programs, specifically Link 16 Network, Command and Control Processor (C2P) and Link Monitoring and Management Tool (LMMT).

ATDLS Integration Program develops new and improved capabilities for Navy TDL users. The Navy Link 16 Network Increment II consists of Dynamic Network Management (DNM), Cryptographic Modernization (CM) and Frequency Remapping (FR). C2P Technology Refresh (TR) and C2P Interoperability will modernize legacy C2P processing components to address C2P component obsolescence and fleet interoperability issues. C2P is a critical component in the Aegis Ballistic Missile Defense (BMD) architecture. C2P Modernization is a service life extension program required to sustain C2P support of Naval Integrated Air and Missile Defense (IAMD) and BMD capabilities. Link 22 development and integration into the C2P allows for standard data link communication with Coalition forces. LMMT will upgrade commercial off-the-shelf hardware and modernize software operating systems. LMMT will improve TDL performance monitoring and management in support of the Integrated Air & Missile Defense (IAMD) and Ballistic Missile Defense (BMD) missions.

Link 16 Network Increment II: (1) Develop and implement CM and FR mandates as a product improvement into Link 16 terminals and integration into shore sites, ship (NGC2P, Next Generation Command and Control Processor), and current Navy Joint Tactical Information Distribution System (JTIDS) airborne platforms; (2) Developmental Testing (DT) / Operational Testing (OT) of Navy platform CM/FR modifications; (3) provide product improvement for continued production capability Multifunctional Information Distribution System (MIDS) on Ship (MOS) Modernization (MOS Mod) and extensibility to new Tactical Data Link capabilities of shipboard Link 16 terminals, (4) qualification of replacement shipboard Link 16 antenna to replace end of life existing antenna. JTIDS, MOS CM/FR, and MOS Mod efforts are in support of NSA and Joint Chiefs of Staff mandates for the modernization of the cryptographic algorithm used in Link 16 terminals and the Department of Defense and the Department of Transportation Memorandum of Agreement for the implementation of a capability to remap any 14 of the existing 51 frequencies in order to remain operable within the United States and its possessions. All Link 16 terminals are required to have this capability to support Link 16 Interoperability.

FY 2019 Justification: Continue government testing of the JTIDS CM/FR Low Rate Initial Production units and deficiency correction. Continue government integrated and operational testing. Prepare for JTIDS CM/FR fielding decision review. PMA 231 will complete E-2C government testing of JTIDS CM/FR. Funding will also provide for MOS CM/FR to complete integration testing and deficiency correction of the MOS CM/FR with the High-Power Amplifier (HPA) Switch necessary for integration of the MIDS LVT Block Updated 2 configuration. MOS will continue integrated testing to support follow on operational testing. Prepare for MOS CM/FR fielding decision review. To address continued production capability, fielding of CM/FR capability and extensibility to new Tactical Data Link capabilities, funding will provide for deficiency correction of MOS Mod and associated MIDS JTRS terminals, continued contractor integration and certification, and integrated and operational testing. Prepare for MOS Mod Fielding Decision Review. Space and Naval Warfare (SPAWAR) Systems Centers will complete government testing and deficiency correction of the new Link 16 antenna, AS-4775, which will replace the obsolete AS-4127A, and prepare for a fielding decision.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*

Command and Control Processor (C2P) Technology Refresh (TR) funds a product improvement effort to the legacy C2P hardware components and allows legacy C2P software to execute on modern processors, thereby extending its effective service life. Product improvement efforts will include C2P software development, hardware integration, update of the C2P development environment to promote sustainability and testing to include follow-on test and evaluation (FOT&E) of the C2P TR baseline. Software development contractors will transform C2P legacy software code with modern supportable software code.

C2P, Phase 3, Increment 2 is planned to include Link 22, which is a modernized replacement for Link 11, providing beyond line of sight (BloS) tactical data communication system utilizing fixed frequency or frequency hopping techniques in the high frequency (HF) (3-30 Megahertz (MHz)) and/or the ultra high frequency (UHF) (225-400 MHz) bands.

C2P Modernization funds the transition of the C2P's legacy CMS-2Y software code to a modern software language. Transition to a modern software language is required to sustain the system software and to enable more affordable transition to new hardware processing components as a result of commercial off the shelf processor obsolescence.

FY 2019 Justification: Continue C2P Link 22 development and Aegis combat system testing. Prepare for Link 22 Follow-on Test and Evaluation (FOT&E) and continue C2P Modernization engineering assessment and design. Specifically, conduct C2P Modernization Development System Requirement Review (SRR), and prepare for Preliminary Design Review (PDR), and Critical Design Review (CDR).

Link Monitoring and Management Tool (LMMT) is a system delivered on commercial off-the-shelf hardware providing gateway functions for multiple Tactical Data Link (TDL) interface, routing and display of TDL data to include Link 16 and Joint Range Extension (JRE). LMMT is also capable of performing TDL network planning, monitoring, management, data forwarding between the TDLs and providing tactical data to the Global Command and Control System (GCCS) for establishing the common operational picture. LMMT requirements will be incrementally developed and delivered in capability drops via the Joint Capabilities Integration Development System (JCIDS) IT Box approach.

FY 2019 Justification: Conduct Capability Drop (CD) 2 fielding technical review (FTR) and fielding decision review (FDR).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Link 16 Network Increment II - Cryptographic Modernization (CM) / Frequency Remapping (FR)	13.119	10.030	10.937	0.000	10.937
Articles:	6	11	10	-	10
FY 2018 Plans: Continue government testing and correct identified deficiencies in JTIDS CM/FR LRIP units including shipboard integration. Conduct JTIDS CM/FR shipboard integrated testing. Initiate preparations for JTIDS CM/FR Fielding Decision Review (FDR). Continue to test the integration of JTIDS CM/FR with the E-2C.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct MOS CM/FR integration testing and deficiency testing of MOS unit using MIDS LVT CM/FR updated terminals and HPA switch. Continue logistics documentation on HPA switch for MOS CM/FR. Continue to identify and correct deficiencies in MOS CM/FR and MIDS LVT CM/FR terminal. Initiate MOS CM/FR developmental testing. Continue vendor testing of MOS Mod EMD units. Continue government testing and initiate at sea developmental and operational testing of MOS Mod. Continue to identify deficiencies in MOS Mod and MIDS JTRS terminals. Initiate preparations for MOS Mod FDR fielding decision review. Continue to integrate and test MIDS JTRS CMN terminal into MOS Modernization terminal. Correct MIDS JTRS CMN terminal deficiencies as identified. Continue Link 16 Network integration logistics support. Continue at sea testing for Link 16 antenna.					
FY 2019 Base Plans: Continue government testing and correct identified deficiencies in JTIDS CM/FR LRIP units including shipboard integration. Continue JTIDS CM/FR shipboard integrated testing including operational test. Continue preparations for JTIDS CM/FR Fielding Decision Review (FDR). Complete testing of the integration of JTIDS CM/FR with the E-2C. Continue MOS CM/FR integration testing and deficiency testing of MOS unit using MIDS LVT CM/FR updated terminals and HPA switch. Correct identified deficiencies in MOS CM/FR and MIDS LVT CM/FR terminal. Continue MOS CM/FR integrated testing including operational test. Continue vendor testing of MOS Mod EMD units. Continue government testing and conduct at sea integrated and operational testing of MOS Mod. Correct identified deficiencies in MOS Mod and MIDS JTRS terminals. Continue preparations for MOS Mod FDR fielding decision review. Continue to integrate and test MIDS JTRS CMN terminal into MOS Modernization terminal. Correct MIDS JTRS CMN terminal deficiencies as identified. Continue Link 16 Network integration logistics support. Conduct Fielding Decision for Link 16 Antenna.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*

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:*** Link 16 RDT&E budget requirement increased from FY18 to FY19 due to additional efforts for Link 16 MOS Modernization on AEGIS Ships.					
Title: Command and Control Processor (C2P)	18.775	11.318	18.707	0.000	18.707
Articles:	-	-	-	-	-
FY 2018 Plans: Continue C2P Link 22 development. Initiate and complete Link 22 Software Build 3. Initiate Link 22 IV&V testing. Commence C2P Modernization hardware/software engineering.					
FY 2019 Base Plans: Continue Link 22 development. Complete Link 22 IV&V testing and commence Aegis combat system testing. Commence Navy link certification. Continue C2P Modernization systems engineering and initiate software design activities. Commence C2P software Modernization Design and Development and document the Functional and Allocated baselines and define the Top Level and Detailed software designs. Document and approve C2P Modernization development efforts through the conduct and completion of the System Requirement Review (SRR), Software Specification Review (SSR) and prepare for the Preliminary Design Review (PDR) and Critical Design Review (CDR).					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: C2P RDT&E budget increased from FY18 to FY19 as C2P Technology Refresh prepares for C2P Modernization Development System Requirement Review (SRR), Preliminary Design Review (PDR), and Critical Design Review (CDR).					
Title: Link Monitoring and Management Tool (LMMT)	5.338	1.990	1.651	0.000	1.651
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete CD 2 DT/OT. ***FY 2019 Base Plans:*** Complete CD2 Fielding Technical Review (FTR) and the Fielding Decision Review (FDR). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** LMMT RDT&E budget decreased from FY18 to FY19 due to the completion of CD2 Fielding Technical Review and Fielding Decision Review.					
Accomplishments/Planned Programs Subtotals	37.232	23.338	31.295	0.000	31.295

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/2614: *Adv Tact Data Link Sys (ATDLS)*	24.395	38.016	34.526	-	34.526	46.962	66.132	75.873	58.942	Continuing	Continuing

Remarks

D. Acquisition Strategy

The JTIDS Crypto Modernization (CM)/Frequency Remapping (FR) development and low rate initial production (LRIP) contract was awarded to Data Link Solutions (DLS). The associated production contract for JTIDS CM/FR will be competitively awarded to support procurement after decision review. Multifunctional Information Distribution System (MIDS) on Ship (MOS) CM/FR will be accomplished through integration of the MIDS LVT Block Upgrade 2 (BU) into the existing MOS cabinet and development of a High-Power Amplifier (HPA) bypass switch. HPA bypass switch development was conducted by SSC Pacific. Production of HPA Switch will be performed by SSC PAC for existing MOS systems. To address the WIN 10 implementation for the MOS system, a new MOS Terminal Controller hardware and software has been developed and will be produced on the MOS Lot 4 contract. MOS MOD contract will provide three engineering manufacturing development (EMD) units for developmental and operational testing. The MOS MOD contract will also provide full rate production units. A second MOS Mod contract for production will be competitively awarded to extend the production period and increase capacity.

The C2P Technology Refresh (TR) and Link 22 development contract was awarded to Northrop Grumman. The Data Terminal Set (DTS) contract to support the Link 11/ Link 22 functions of the C2P system was awarded in August 2016. An existing IDIQ MAC contract will be used to procure initial TR units with a new ATDLS production contract planned for future procurements in FY 19 and beyond.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*

The Link Monitoring and Management Tool (LMMT) capability will replace previously-fielded Air Defense Systems Integrator (ADSI) systems. LMMT will leverage existing government-off-the-shelf (GOTS) software and commercial-off-the-shelf (COTS) hardware. LMMT capabilities are implemented primarily in software and will be developed in capability drops (CDs). Existing GOTS software will be updated to incorporate network performance monitoring and management capabilities by Space and Naval Warfare (SPAWAR) System Center (SSC).

E. Performance Metrics

Link 16 Network Dynamic Network Management (DNM): Successfully achieve initial operational capability. Successfully conduct full deployment decision review. Successfully complete operation test readiness review (OTRR). Successfully complete developmental test / operational test.

Link 16 Network Cryptographic Modernization: Successful implementation of updated cryptographic algorithm as specified by National Security Agency (NSA) certification in Joint Tactical Information Distribution System (JTIDS), Multifunctional Information Distribution System (MIDS) on Ship (MOS), and MOS Modernization (MOS Mod) Link 16 terminals.

Link 16 Network Frequency Remapping: Successful implementation of a frequency remapping capability as specified in Department of Defense/Department of Transportation Memorandum of Agreement regarding the 960-1215 MHz frequency band of 31 Dec 02 in Joint Tactical Information Distribution System (JTIDS), Multifunctional Information Distribution System (MIDS) on Ship (MOS) and MOS Modernization (MOS Mod) Link 16 Terminals.

Link 16 Antenna: Meet existing antenna performance specifications.

Link 16 Network Production Capability: Production shipboard Link 16 terminals available to meet new construction shipboard requirements.

Command and Control Processor (C2P): Successfully achieve C2P Technology Refresh fielding and thereby maintain operational availability.

Link 22: Successfully achieve Link 22 implementation fielding, meeting operational requirement.

LMMT: Successfully meet operational requirements and achieve fielding decision reviews (FDR) for Capability Drops 1, 2 and 3.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS 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
ATDLS Product Development and Integration	Various	Various : Various	387.088	0.000		0.000		0.000		-		0.000	0.000	387.088	387.088
Link 16 Network Development (JTIDS)	C/CPIF	DLS (BAE/ Rockwell) : Wayne, NJ	61.010	0.000		0.000		2.028	Oct 2018	-		2.028	Continuing	Continuing	Continuing
Link 16 Network E-2C Integration	WR	PMA 231 : Pax River, MD	8.670	2.614	Oct 2016	2.464	Oct 2017	1.043	Oct 2018	-		1.043	Continuing	Continuing	Continuing
Link 16 Network Development (MOS MOD)	C/FPIF	DLS (BAE/ Rockwell) : Wayne, NJ	16.481	0.448	Oct 2016	1.183	Oct 2017	1.628	Oct 2018	-		1.628	Continuing	Continuing	Continuing
Link 16 Network Integrated Logistics Support	C/CPFF	SeaPort-E : San Diego, CA	2.772	0.103	Nov 2016	0.102	Oct 2017	0.023	Oct 2018	-		0.023	Continuing	Continuing	Continuing
Link 16 Network JTIDS Depot Repair Bench Update	WR	Warner Robins Air Logistics Center : Warner Robins, GA	4.596	4.849	Dec 2016	0.000		0.000		-		0.000	0.000	9.445	9.445
Link 16 Network Technical Design Agents	C/CPFF	SeaPort-E : San Diego, CA	4.838	1.456	Nov 2016	0.948	Oct 2017	0.734	Oct 2018	-		0.734	Continuing	Continuing	Continuing
Link 16 Network Systems Engineering	WR	SPAWARSYSCEN PAC : San Diego, CA	53.336	1.530	Oct 2016	1.487	Oct 2017	1.270	Oct 2018	-		1.270	Continuing	Continuing	Continuing
Link 16 Network IV&V	WR	SPAWARSYSCEN PAC : San Diego, CA	4.267	0.380	Oct 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
C2P Development (Tech Refresh)	C/IDIQ	Northrop Grumman : San Diego, CA	21.444	0.872	May 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
C2P Development (Link 22)	C/IDIQ	Northrop Grumman : San Diego, CA	4.236	0.872	May 2017	2.224	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
C2P Development Data Terminal Set	C/IDIQ	DRS : Beavercreek, OH	5.617	1.647	Dec 2016	0.000		0.000		-		0.000	0.000	7.264	7.264
C2P Systems Engineering	WR	SPAWARSYSCEN PAC : San Diego, CA	18.764	3.274	Oct 2016	1.029	Oct 2017	2.927	Oct 2018	-		2.927	Continuing	Continuing	Continuing
C2P IV&V	WR	SPAWARSYSCEN PAC : San Diego, CA	8.877	3.842	Oct 2016	3.424	Oct 2017	3.290	Oct 2018	-		3.290	Continuing	Continuing	Continuing
C2P Development & Integration	WR	SPAWARSYSCEN PAC : San Diego, CA	10.194	5.706	Oct 2016	1.211	Oct 2017	8.645	Oct 2018	-		8.645	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 2126 / *ATDLS 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
C2P Integrated Logistics Support	C/CPFF	SeaPort-E : San Diego, CA	4.509	0.254	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
LMMT Integrated Logistics Support	C/CPFF	SeaPort-E : San Diego, CA	1.033	0.350	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
LMMT Development	WR	SPAWARSYSCEN PAC : San Diego, CA	7.268	1.938	Oct 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
LMMT Systems Engineering	WR	SPAWARSYSCEN PAC : San Diego, CA	3.797	1.000	Oct 2016	0.650	Oct 2017	1.237	Oct 2018	-		1.237	Continuing	Continuing	Continuing
LMMT IV&V	WR	SPAWARSYSCEN PAC : San Diego, CA	0.979	0.800	Oct 2016	0.310	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	629.776	31.935		15.032		22.825		-		22.825	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
ATDLS Test and Evaluation	Various	Various : Various	65.171	0.000		0.000		0.000		-		0.000	0.000	65.171	65.171
Link 16 Network T&E	WR	SPAWARSYSCEN PAC : San Diego, CA	10.853	1.586	Oct 2016	3.684	Dec 2017	3.826	Dec 2018	-		3.826	Continuing	Continuing	Continuing
C2P T&E	WR	SPAWARSYSCEN PAC : San Diego, CA	2.101	0.150	Oct 2016	1.994	Nov 2017	2.251	Oct 2018	-		2.251	Continuing	Continuing	Continuing
LMMT T&E	WR	SPAWARSYSCEN PAC : San Diego, CA	2.400	0.800	Oct 2016	0.515	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	80.525	2.536		6.193		6.077		-		6.077	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
ATDLS System Engineering Support	Various	Various : Various	35.988	0.000		0.000		0.000		-		0.000	0.000	35.988	35.988

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 2126 / *ATDLS Integration*	

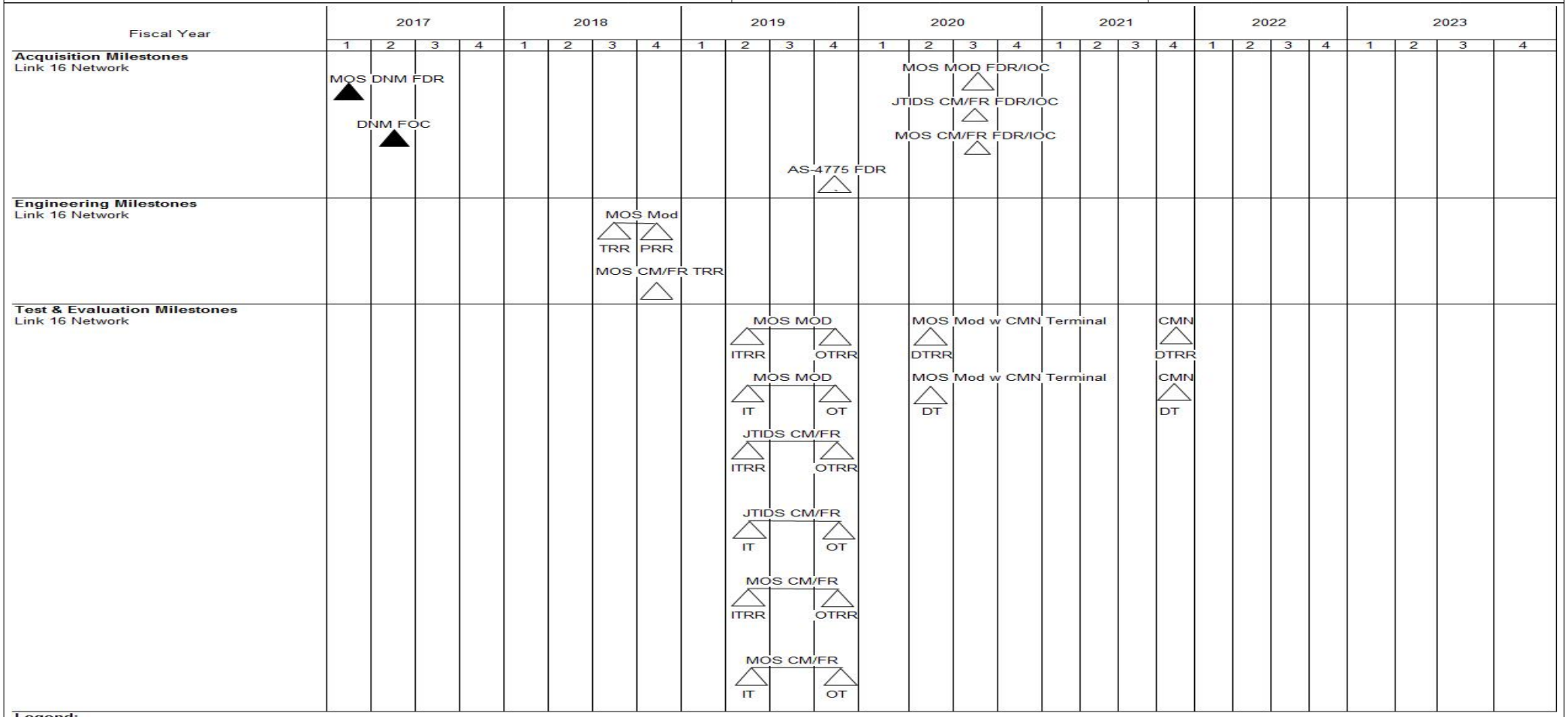
Management Services ($ in Millions)

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
Link 16 Network Program Management Support	C/CPFF	SeaPort-E : San Diego, CA	5.102	0.335	Nov 2016	0.161	Oct 2017	0.385	Oct 2018	-		0.385	Continuing	Continuing	Continuing
C2P Program Management Support	C/CPFF	SeaPort-E : San Diego, CA	6.672	0.800	Nov 2016	0.716	Nov 2017	0.777	Nov 2018	-		0.777	Continuing	Continuing	Continuing
C2P Systems Engineering Support	C/CPFF	SeaPort-E : San Diego, CA	0.000	1.176	Nov 2016	0.720	Nov 2017	0.817	Nov 2018	-		0.817	Continuing	Continuing	Continuing
LMMT Program Management Support	C/CPFF	SeaPort-E : San Diego, CA	1.071	0.450	Nov 2016	0.516	Oct 2017	0.414	Nov 2018	-		0.414	Continuing	Continuing	Continuing
		Subtotal	48.833	2.761		2.113		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	759.134	37.232		23.338		31.295		-		31.295	Continuing	Continuing	N/A

Remarks

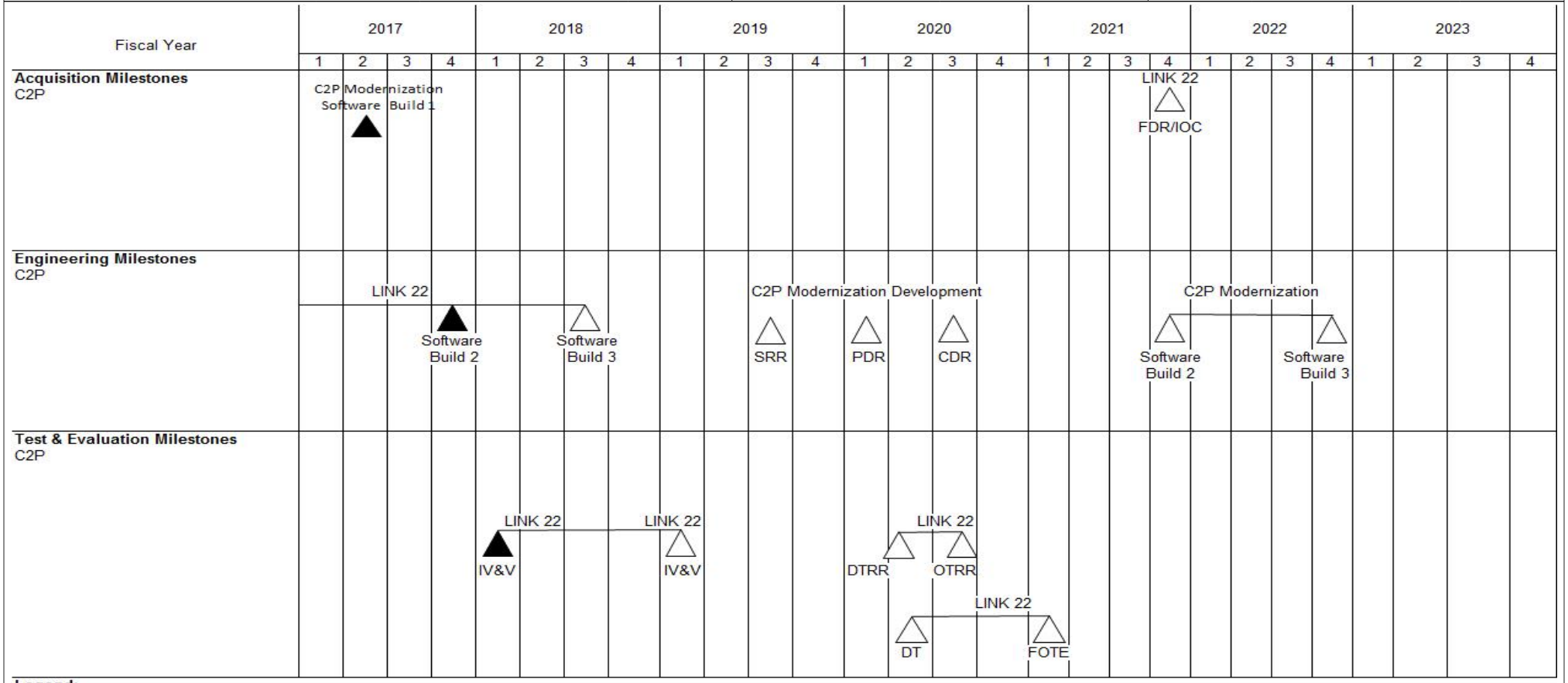
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*



Legend:

CM - Cryptographic Modernization
DNM - Dynamic Network Management
DT - Developmental Test
DTRR - Developmental Test Readiness Review
FDR - Fielding Decision Review
FOC - Full Operating Capability
FOT&E - Follow-on Operational Test & Evaluation
FR - Frequency Remapping
IOC - Initial Operating Capability
IT - Integrated Test
ITRR - Integrated Test Readiness Review
IV&V - Independent Verificaiton and Validation
JTIDS - Joint Tactical Information Distribution System
MOS - MIDS On Ship
MOS MOD - MOS Modernization
OT - Operational Test
OTRR - Operational Test Readiness Review
PRR - Production Readiness Review
TRR - Test Readiness Review

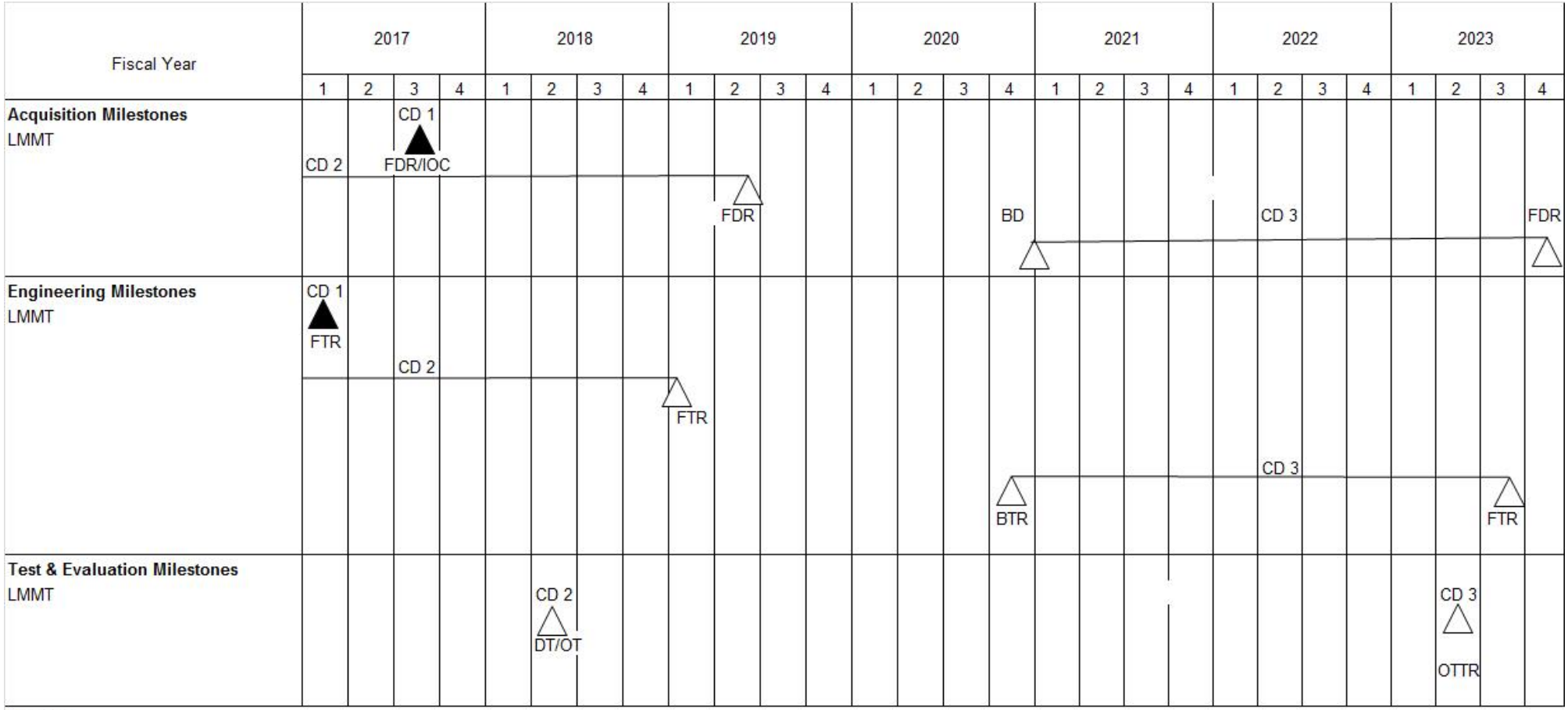
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*



Legend:

C2P - Command and Control Processor
CDR - Critical Design Review
DT - Developmental Test
DTRR - Developmental Test Readiness Review
FDR - Fielding Decision Review
FOTE - Follow on Test and Evaluation
IOC - Initial Operating Capability
IV&V - Independent Verificaiton and Validation
OTRR - Operational Test Readiness Review
PDR - Preliminary Design Review
SRR - System Requirement Review

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*



Legend:

BD - Build Decision	CD - Capability Drop	FDR - Fielding Decision Review	FTR - Fielding Technical Review	OT - Operational Test
BTR - Build Technical Review	DT - Developmental Test	FOC - Full Operational Capability	IOC - Initial Operating Capability	OTRR - Operational Test Readiness Review

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2126				
LMMT CD 1 Fielding Technical Review	1	2017	1	2017
Link 16 Network MOS DNM Fielding Decision Review	1	2017	1	2017
C2P Modernization Software Build 1	2	2017	2	2017
Link 16 Network DNM Full Operating Capability	2	2017	2	2017
LMMT CD 1 Fielding Decision Review/Initial Operating Capability	3	2017	3	2017
C2P Link 22 Software Build 2	4	2017	4	2017
C2P Link 22 IV&V	1	2018	1	2019
LMMT CD 2 Developmental/Operational Test	2	2018	2	2018
Link 16 Network MOS Modernization Test Readiness Review	3	2018	3	2018
C2P Link 22 Software Build 3	3	2018	3	2018
Link 16 Network MOS Modernization Production Readiness Review	4	2018	4	2018
Link 16 Network MOS CM/FR Test Readiness Review	4	2018	4	2018
LMMT CD 2 Fielding Technical Review	1	2019	1	2019
LMMT CD 2 Fielding Decision Review	2	2019	2	2019
Link 16 MOS Mod Integrated Test Readiness Review	2	2019	2	2019
Link 16 MOS Mod Integrated Test	2	2019	2	2019
Link 16 JTIDS CM/FR Integrated Test Readiness Review	2	2019	2	2019
Link 16 JTIDS CM/FR Integrated Test	2	2019	2	2019
Link 16 MOS CM/FR Integrated Test Readiness Review	2	2019	2	2019
Link 16 MOS CM/FR Integrated Test	2	2019	2	2019
C2P Modernization Development System Requirement Review	3	2019	3	2019
Link 16 Network MOS MOD Operational Test Readiness Review	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 2126 / *ATDLS Integration*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Link 16 Network MOS MOD Operational Test	4	2019	4	2019
Link 16 Network AS-4775 Fielding Decision Review	4	2019	4	2019
Link 16 Network JTIDS CM/FR Operational Test Readiness Review	4	2019	4	2019
Link 16 Network MOS CM/FR Operational Test Readiness Review	4	2019	4	2019
Link 16 Network JTIDS CM/FR Operational Test	4	2019	4	2019
Link 16 Network MOS CM/FR Operational Test	4	2019	4	2019
C2P Modernization Development Preliminary Design Review	1	2020	1	2020
Link 16 Network MOS Mod with CMN Terminal DT	2	2020	2	2020
C2P Link 22 Developmental Test	2	2020	2	2020
Link 16 Network MOS Mod with CMN Terminal DTRR	2	2020	2	2020
Link 16 Network MOS MOD Fielding Decision Review/Initial Operating Capability	3	2020	3	2020
Link 16 Network JTIDS CM/FR Fielding Decision Review/Initial Operating Capability	3	2020	3	2020
Link 16 Network MOS CM/FR Fielding Decision Review/Initial Operating Capability	3	2020	3	2020
C2P Modernization Development Critical Design Review	3	2020	3	2020
LMMT CD 3 Build Technical Review	4	2020	4	2020
LMMT CD 3 Build Decision	4	2020	4	2020
C2P Link 22 Follow on Test and Evaluation	1	2021	1	2021
C2P Link 22 Fielding Decision Review/Initial Operating Capability	4	2021	4	2021
C2P Modernization Software Build 2	4	2021	4	2021
Link 16 Network CMN DTRR	4	2021	4	2021
Link 16 Network CMN DT	4	2021	4	2021
C2P Modernization Software Build 3	4	2022	4	2022
C2P Link 22 Operational Test Readiness Review	3	2020	3	2020
LMMT CD 3 Fielding Technical Review	3	2023	3	2023
LMMT CD 3 Fielding Decision Review	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*				Project (Number/Name) 3020 / *MIDS/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**
3020: *MIDS/JTRS*	250.992	55.601	50.285	59.515	-	59.515	28.765	23.304	23.080	23.535	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 554

Note

In accordance with the Acquisition Decision Memorandum dated 11 July 2012, the Joint Tactical Radio Systems Programs of Record (JTRS PORs) transitioned to a Military Department-managed program. MIDS transitioned to the Navy under PE 0205604N Tactical Data Links but was formerly in PE 0604280N JT Tact Radio Sys (JTRS).

A. Mission Description and Budget Item Justification

The Multifunctional Information Distribution System (MIDS) program office is the Lead Service for Department of Defense (DOD) Link 16 capability and consists of two (2) product lines, MIDS Low Volume Terminal (LVT) (legacy hardware defined radio) and MIDS Joint Tactical Radio System (JTRS) (software defined radio). MIDS-LVT provides Link 16 capability to platforms that were unable to employ Joint Tactical Information Distribution System due to space and weight constraints. The MIDS-LVT effort is a cooperative development program between France, Germany, Italy, Spain, and the United States with United States joint service participation (Navy, Army, Air Force), and has provided over 11,000 terminals to 48 Nations providing interoperability with North Atlantic Treaty Organization (NATO) and coalition partners. The Department of Defense (DoD) established the program to design, develop, and deliver low volume, lightweight tactical information system terminals for U.S. and Allied fighter aircraft, bombers, helicopters, ships, and ground sites. MIDS-LVT significantly increases force effectiveness and minimizes hostile actions and friend-on-friend engagements. The current development program for LVT is the Block Upgrade 2 effort designed to meet the Cryptographic Modernization (CM) and Frequency Remapping (FR) mandates required for all US and international users which occurs inside the FYDP. The terminal design is smaller, lighter, highly reliable, interoperable with Joint Tactical Information Distribution System (JTIDS) Class 2 terminal, compatible with all the participants' designated platforms, affordable, and re-configurable to individual user needs and budgets.

MIDS JTRS, designed as a Pre-Planned Product Improvement (P3I) and executed as an Engineering Change Proposal (ECP) to the production MIDS-LVT configuration, completed qualification in the first quarter of fiscal year 2010. It facilitated the JTRS incremental approach for fielding advanced JTRS transformational networking capability and transformed the MIDS-LVT into a 4-channel, Software Communications Architecture (SCA) compliant, Joint Tactical Radio. A form-fit-function replacement to MIDS-LVT, MIDS JTRS also adds three programmable 2 Megahertz (MHz) to 2 Gigahertz (GHz) channels capable of hosting the JTRS legacy and networking waveforms. In addition to Link 16, Tactical Air Navigation, and voice functionality found in MIDS-LVT, MIDS JTRS has four channels and adds capabilities such as Link 16 Enhanced Throughput, Link 16 Frequency Re-mapping, software programmability, Cryptographic Modernization, and Four Net Concurrent Multi-Netting with Concurrent Contention Receive (CMN-4). MIDS Modernization Increment 2 is a specific and distinct effort that will transform the MIDS JTRS radio to a true software defined radio allowing rapid technology insertion, in the field, to outpace the threat including software updates for maintenance, reliability, security, cyber, interoperability and capacity. MIDS Modernization Increments 3 and follow on efforts have yet to be funded, but are currently in the design stages. MIDS Modernization Increment 1 will be fielded with all MIDS JTRS CMN4 terminals.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3020 / *MIDS/JTRS*

The TTNT waveform is the next waveform to be added to the MIDS JTRS terminal. TTNT is a low latency, high throughput waveform that has the capability to support data exchange between fast-moving tactical aircraft, weapons, and unmanned aircraft, in addition to air, land, and sea-based command and control nodes, in a variety of air-to-air and air-to-ground missions including time sensitive targeting, air warfare, close air support, non-traditional ISR, and anti-surface warfare. TTNT capability integration into the MIDS JTRS directly supports Naval Integrated Fire Control - Counter Air From-The-Air (NIFC-CA FTA) capability requirements. These capabilities provide Joint Airborne Network-Tactical Edge functionality to run advanced mission applications in a cross-platform/cross-domain tactical network enterprise, the TTNT capability will be in addition to the CMN-4 terminal providing Link 16 capability, and the ability to simultaneously participate in four Link 16 Nets.

The FY19 Budget continues the development of MIDS Modernization Increment 2 (MMI2) that enhances Link 16 performance, provides rapid technology insertion to outpace the threat. MMI2 also improves fleet support for increased operational availability. In FY19, MMI2 will conduct Preliminary and Critical Design Reviews. The FY19 budget also supports the continuation of the Tactical Targeting Networking Technology (TTNT) terminal testing and integration as well as the updates to the TTNT waveform. It supports the continuation of Contractor and Government First Article Qualification Testing.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: MIDS	55.601	50.285	59.515	0.000	59.515
Articles:	-	-	-	-	-
FY 2018 Plans: Complete MIDS JTRS Concurrent Multi-Netting with Concurrent Contention Receive (CMN-4) F/A-18 Developmental Test (DT), conduct an Operational Assessment (OA), and receive a MIDS JTRS CMN-4 F/A-18 fielding decision. Achieve MIDS JTRS CMN-4 Initial Operational Capability. Complete the Crypto Sub-System (CSS)/Protected Core Processer (PCP) upgrade for MIDS JTRS CMN-4 and Tactical Targeting Network Technology (TTNT) terminals. Execute a MIDS JTRS CMN-4 software development effort to support E-2D and MOS Modernization CMN-4 fielding. Complete the MIDS Modernization Increment 2 (MMI2- enhanced Link 16 performance, rapid technology insertion and increased operational availability) risk reduction efforts, including completion of the Functional Baseline (FBL) and the draft Allocated Baseline (ABL) specification development, upgraded Link 16 transceiver prototype, and conduct a joint industry/Government System Requirements Review-II (SRR-II). Award the MMI2 full development contract to continue systems engineering requirements analysis, a joint industry/Government System Functional Review (SFR), further Link 16 transceiver design efforts, and continue software/firmware updates to allow front-panel-loading in the field to enable rapid insertion of new capability. Continue development of TTNT including upgrades (Build Pass 2) for the Transceivers, TTNT External Power Amplifiers (TEPA) and High Powered Amplifiers (HPA). (SRF funding will not be used on the L band					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3020 / *MIDS/JTRS*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
requirements; L band delineated tasks will be tracked separately). Continue to update the operating environment for TTNT. Begin TTNT Production Representative Terminals delivery. Commence Technology Readiness Review. Begin Contractor First Article Qualification Testing (CFAQT). Deliver MIDS JTRS TTNT Production Representative Terminals (PRTs) for initial integration into the E-2D, EA-18G and F/A-18E/F. Complete the Multifunctional Information Distribution System Low Volume Terminal (MIDS-LVT) Block Upgrade 2 (BU2) test and integration. Award the MIDS-LVT BU2 Retrofit Contract in order to meet the Crypto Modernization and Frequency Remapping mandates established by NSA and Department of Transportation respectively. Continue MIDS systems engineering, communication security, IA and program management support. Continue Link 16 Waveform development and begin the Tactical Targeting Networking Technology (TTNT) Waveform development fixes and updates.					
FY 2019 Base Plans: Continue the full development of MIDS Modernization Increment 2 (MMI2) which includes a Preliminary Design Review (PDR) to approve the Allocated Baseline (ABL), continued development of the MIDS Mod Engineering Design Model (EDM) software, upgraded Link 16 transceiver hardware, systems integration, and continued software/firmware updates to allow front-panel-loading in the field to enable rapid insertion of new capability. MMI2 will also conduct a Critical Design Review post PDR and PDR updates. Complete MIDS JTRS Concurrent Multi-Netting with Concurrent Contention Receive (CMN-4) post Block Cycle 3 (BC3) software builds to support E-2D and MIDS on Ship (MOS) Modernization (MOS MOD) CMN-4 fielding. Complete TTNT Contractor First Article Qualification testing and begin Government First Article Qualification testing. Begin developmental testing of the TTNT terminal, external powered amplifiers and high powered amplifiers for E-2D and EA-18G platform requirements. Continue MIDS systems engineering, communication security, IA and program management support. Continue with Link 16 Waveform development fixes and updates.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3020 / *MIDS/JTRS*

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 $9.23M from FY18 to FY19 due to the MIDS Modernization Increment 2 full development contract award in 3Q2018 (FY18 contract is for only 5 months whereas FY19 contract is for the full fiscal year). This results in the increase in budget from FY18 to FY19 of $9.23M.					
Accomplishments/Planned Programs Subtotals	55.601	50.285	59.515	0.000	59.515

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Multifunctional Information Distribution System Joint Tactical System (MIDS JTRS) development was initiated as a major modification to the MIDS-LVT using an Engineering Change Proposal to the existing production contracts. Development efforts included the Phase 2B Core terminal. The U.S. prime contractors from the MIDS-LVT program, Data Link Solutions (DLS) and ViaSat Inc., cooperatively designed and developed the Core terminal. Each prime contractor built and qualified Production Verification Terminals. The U.S. implemented a continuous competition strategy between DLS and ViaSat that will be maintained throughout the MIDS JTRS production phase. This strategy was successfully used on MIDS-LVT production.

The FY19 budget supports the continuation of the Tactical Targeting Networking Technology (TTNT) terminal testing and integration as well as the updates to the TTNT waveform. It supports the continuation of Contractor and Government First Article Qualification Testing. The FY19 budget also supports the continuation of the development effort for rapid technology insertion into the MIDS JTRS terminal to outpace the threat (MIDS Modernization Increment 2) with Preliminary and Critical Design Reviews.

E. Performance Metrics

The MIDS-LVT and MIDS JTRS programs are employing mature, software-defined radio technologies and developing hundreds of thousands of lines of code. These software metrics are used to quantify the quality and progress of each software product's development over time. MIDS employs earned value metrics to monitor contract performance on its prime development contracts, as required.

MIDS-LVT: The 11 performance measures are: L16 Waveform Compatibility, L16 Message Standards, L16 IER; Interoperability, L16 Coded Error Message Probability, Weight/Volume, L16 JAM Resistance, L16 Voice Channels, L16 Communication Range Data, L16 Communications Range Voice, L16 Relay.

MIDS JTRS: The 15 performance measures are: L16 Waveform Compatibility, L16 Waveform Standards, L16 Coded Error Message Probability, L16 Jamming Resistance, L16 Communication Range-Data, L16 Communications Range-Voice, L16 Relay, Start-up (Terminal Single Channel), Operational Communications - Passive Synchronization, Operational Communications - Automatic Message Acknowledgement, Operational Communications - Multi-Net, Operational Communications, Crypto Control, Navigation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 3020 / *MIDS/JTRS*

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	30.882	0.000		0.000		0.000		-		0.000	0.000	30.882	30.882
MIDS JTRS NIFC-CA TTNT Full Development	C/CPFF	DLS : Cedar Rapids, IA	58.867	7.430	Oct 2016	0.000		0.000		-		0.000	0.000	66.297	66.297
MIDS JTRS NIFC-CA TTNT Full Development	C/CPFF	ViaSat : San Diego, CA	34.297	0.873	Dec 2016	0.000		0.000		-		0.000	0.000	35.170	35.170
MIDS-LVT BU2 Full Development	C/CPIF	DLS : Cedar Rapids, IA	28.853	9.320	Dec 2016	0.000		0.000		-		0.000	0.000	38.173	29.874
MIDS-LVT BU2 Full Development	C/CPIF	ViaSat : San Diego, CA	33.736	7.528	Dec 2016	0.000		0.000		-		0.000	0.000	41.264	33.715
MIDS-LVT BU2 Software Full Development	C/CPIF	BAE : Wayne, NJ	23.726	0.045	Feb 2017	0.000		0.000		-		0.000	0.000	23.771	24.946
BU2 Integration	C/CPFF	Lockheed Martin : Bethesda, MD	0.000	0.500	Aug 2017	1.500	Nov 2017	0.000		-		0.000	0.000	2.000	2.000
MIDS JTRS CMN-4 Production Representative Terminals (PRT)	C/FFP	DLS : Cedar Rapids, IA	2.345	0.242	Sep 2017	0.000		0.000		-		0.000	0.000	2.587	2.587
MIDS JTRS CMN-4 Production Representative Terminals (PRT)	C/FFP	ViaSat : San Diego, CA	2.301	0.483	Nov 2016	0.000		0.000		-		0.000	0.000	2.784	2.784
TTNT Development Contract (L Band)	C/CPFF	DLS : Cedar Rapids, IA	0.064	10.767	Mar 2017	5.736	Nov 2017	6.081	Mar 2019	-		6.081	Continuing	Continuing	Continuing
TTNT Development Contract (L Band)	C/CPFF	ViaSat : San Diego, Ca	0.020	1.000	Mar 2017	2.206	Mar 2018	3.274	Mar 2019	-		3.274	Continuing	Continuing	Continuing
MIDS JTRS Software Merge BC3	C/CPIF	ViaSat : San Diego, CA	4.112	1.432	Mar 2017	0.000		0.000		-		0.000	0.000	5.544	5.544
Link 16 Waveform Development	WR	SSC PAC : San Diego, CA	1.876	1.217	Nov 2016	0.775	Oct 2017	1.700	Nov 2018	-		1.700	Continuing	Continuing	Continuing
Air Dominance Assured Communications L16 WF (MIDS Mod Incr 2)	C/BA	NAVAIR : China Lake, CA	1.112	0.020	Feb 2017	0.000		0.000		-		0.000	0.000	1.132	1.132
MIDS Mod Inc 2 Risk Reduction	C/CPFF	DLS : Cedar Rapids, IA	0.360	2.386	Jan 2017	1.500	Nov 2017	0.000		-		0.000	0.000	4.246	4.247

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 3020 / *MIDS/JTRS*	

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
MIDS Mod Inc 2 Risk Reduction	C/CPFF	ViaSat : San Diego, CA	0.300	1.479	Jan 2017	1.000	Dec 2017	0.000		-		0.000	0.000	2.779	2.779
MIDS JTRS CSS/PCP Respin	C/CPFF	DLS : Cedar Rapids, IA	1.247	1.742	Jan 2017	0.000		0.000		-		0.000	0.000	2.989	2.989
MIDS JTRS CSS/PCP Respin	C/CPFF	ViaSat : San Diego, CA	0.639	2.366	Jan 2017	0.000		0.000		-		0.000	0.000	3.005	3.005
ER3A&3B (MIDS JTRS BC3+)	C/CPFF	TBD : TBD	0.000	0.000		3.668	Feb 2018	0.000		-		0.000	0.000	3.668	3.668
MIDS Mod Inc 2 Full Development	C/CPFF	DLS : Cedar Rapids, IA	0.000	0.000		16.967	Apr 2018	26.452	Apr 2019	-		26.452	Continuing	Continuing	Continuing
MIDS Mod Inc 2 Full Development	C/CPFF	ViaSat : San Diego, CA	0.000	0.000		10.527	Apr 2018	17.635	Apr 2019	-		17.635	Continuing	Continuing	Continuing
ER0F	C/CPFF	DLS : Cedar Rapids, IA	0.000	0.764	May 2017	0.000		0.000		-		0.000	0.000	0.764	0.764
ER0F	C/CPFF	ViaSat : San Diego, CA	0.000	0.262	May 2017	0.000		0.000		-		0.000	0.000	0.262	0.262
MIDS Mod Investigation Reports	C/CPFF	DLS : Cedar Rapids, IA	0.000	0.381	May 2017	0.000		0.000		-		0.000	0.000	0.381	0.381
MIDS Mod Investigation Reports	C/CPFF	ViaSat : San Diego, CA	0.000	0.067	May 2017	0.000		0.000		-		0.000	0.000	0.067	0.067
		Subtotal	224.737	50.304		43.879		55.142		-		55.142	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
Multi-level security analysis	WR	NAVAIR : China Lake, Ca	0.000	0.000		0.393	Nov 2017	0.000		-		0.000	0.000	0.393	0.393
Modeling and Simulation	WR	NAVAIR : China Lake, Ca	3.110	0.764	Feb 2017	2.911	Jan 2018	1.696	Jan 2019	-		1.696	Continuing	Continuing	Continuing
		Subtotal	3.110	0.764		3.304		1.696		-		1.696	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 3020 / *MIDS/JTRS*	

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 Eval Prior Years	Various	Various : Various	6.380	0.000		0.000		0.000		-		0.000	0.000	6.380	6.380
MIDS JTRS CMN-4/MIDS Mod GFAQT and JTEL LAB	WR	SSC : San Diego, CA	1.105	0.132	Dec 2016	0.248	Dec 2017	0.205	Dec 2018	-		0.205	0.000	1.690	1.690
TTNT Link 16 Mod/ Simulation	MIPR	Lincoln Labs : Hanscom AFB, MA	0.976	0.113	Dec 2016	0.000		0.000		-		0.000	0.000	1.089	1.089
MIDS JTRS Flight Test	WR	NAVAIR : China Lake, CA	0.000	0.065	Feb 2017	0.000		0.000		-		0.000	0.000	0.065	0.065
JTEL Testing Support	C/CPFF	G-2 : San Diego, CA	0.000	0.095	Mar 2017	0.052	Nov 2017	0.095	Mar 2019	-		0.095	Continuing	Continuing	Continuing
MIDS Mod 1 OT Support	C/CPFF	Engility : Chantilly, VA	0.000	0.010	Apr 2017	0.000		0.000		-		0.000	0.000	0.010	0.010
MIDS Mod 1 OT Flight Test	MIPR	Department of Interior : Lakewood, CO	0.000	0.599	Apr 2017	0.000		0.000		-		0.000	0.000	0.599	0.599
		Subtotal	8.461	1.014		0.300		0.300		-		0.300	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	1.201	0.000		0.000		0.000		-		0.000	0.000	1.201	1.201
Systems Engineering Support	MIPR	MITRE : Bedford, MA	5.233	0.977	Nov 2016	1.446	Nov 2017	1.013	Dec 2018	-		1.013	Continuing	Continuing	Continuing
Government Engineering Support TTNT	WR	SSC : San Diego, CA	6.650	1.505	Jan 2017	0.742	Oct 2017	0.764	Nov 2018	-		0.764	Continuing	Continuing	Continuing
Govt Program Support NIFC-CA	WR	NAVAIR : Pax River, MD	0.939	0.000		0.030	Nov 2017	0.000		-		0.000	0.000	0.969	0.969
COR and Logistics Support	WR	SSC : Charleston, SC	0.000	0.076	Jan 2017	0.080	Nov 2017	0.082	Nov 2018	-		0.082	Continuing	Continuing	Continuing
Information Assurance	MIPR	NSA : Fort Meade, MD	0.000	0.051	Dec 2016	0.055	Dec 2017	0.057	Dec 2018	-		0.057	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 3020 / *MIDS/JTRS*

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/ Programmatic Support	C/CPFF	Sentek : San Diego, Ca	0.661	0.518	Nov 2016	0.250	Dec 2017	0.258	Dec 2018	-		0.258	Continuing	Continuing	Continuing
ARL SIPRNET Connection	MIPR	ARL : Adelphi, MD	0.000	0.096	Dec 2016	0.099	Dec 2017	0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
Contractor Program Management and Financial Support	C/CPFF	G2 : San Diego, CA	0.000	0.296	Jun 2017	0.100	Jan 2018	0.103	Jan 2019	-		0.103	Continuing	Continuing	Continuing
		Subtotal	14.684	3.519		2.802		2.377		-		2.377	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	250.992	55.601		50.285		59.515		-		59.515	Continuing	Continuing	N/A

Remarks

In accordance with the ADM dated 11 July 2012, the Joint Tactical Radio Systems Programs of Record (JTRS PORs) transitioned to a Military Department-managed program.
MIDS transitioned to the Navy under PE 0205604N Tactical Data Links but was formerly in PE 0604280N JT Tact Radio Sys (JTRS).
LCM - MIDS-LVT Crypto Module WF - Waveform BU2 - Block Upgrade 2 BC3 - Block Cycle 3
TTNT - Tactical Targeting Network Technology CSS/PCP - Cryptographic Sub System/Protected Core Processor
ER0F - Engineering Release 0F ER0G - Engineering Release 0G DLS - Data Link Solutions
NIFC-CA - Naval Integrated Fire Control - Counter Air PDR - Preliminary Design Review CDR - Critical Design Review
TRR - Test Readiness Review DT - Development Test IR - Information Repository JTEL - Joint Test and Evaluation Lab
CFAQT - Contractor First Article Qualification Test GFAQT - Gov't First Article Qualification Test

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3020 / *MIDS/JTRS*

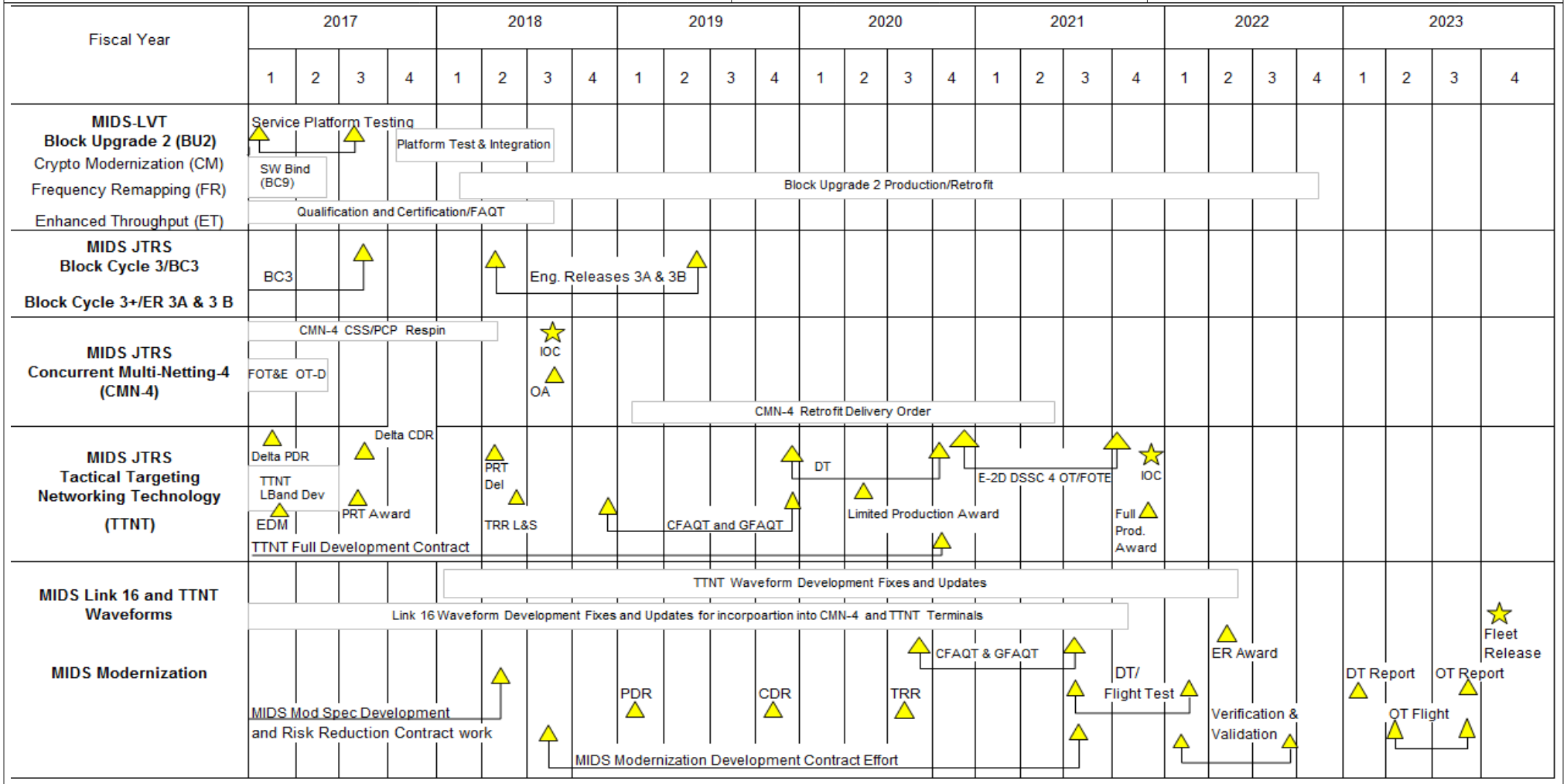


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3020 / *MIDS/JTRS*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MIDS				
MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Qualification and Certification/FAQT	1	2017	3	2018
MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Software Bind (SW)	1	2017	2	2017
MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Service Platform Testing	1	2017	3	2017
MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Block Upgrade 2 Production/Retrofit	1	2018	4	2022
MIDS-LVT Block Upgrade 2 (BU2/CM/FR/ET): Platform Test and Integration	4	2017	3	2018
MIDS JTRS Block Cycle 3 (BC3): BC3	1	2017	3	2017
MIDS JTRS Block Cycle 3 (BC3): Block Cycle 3+ (ER 3A & 3B)	2	2018	2	2019
MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): Full Operational Test and Eval OT-D	1	2017	2	2017
MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): Operational Assessment	3	2018	3	2018
MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): IOC (Initial Operational Capability)	3	2018	3	2018
MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): CMN-4 Retrofit Delivery Order	1	2019	2	2021
MIDS JTRS Concurrent Multi-Netting-4 (CMN-4): CMN-4 CSS/PCP Respin	1	2017	2	2018
MIDS JTRS Tactical Targeting Networking Technology (TTNT): TTNT Hardware/ Software Development (L Band)	1	2017	2	2017
MIDS JTRS Tactical Targeting Networking Technology (TTNT): Delta Preliminary Design Review	1	2017	1	2017
MIDS JTRS Tactical Targeting Networking Technology (TTNT): Engineering Design Model	1	2017	1	2017
MIDS JTRS Tactical Targeting Networking Technology (TTNT): Delta Critical Design Review	3	2017	3	2017
MIDS JTRS Tactical Targeting Networking Technology (TTNT): TTNT Full Development Contract	1	2017	4	2020
MIDS JTRS Tactical Targeting Networking Technology (TTNT): PRT Award	3	2017	3	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3020 / *MIDS/JTRS*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MIDS JTRS Tactical Targeting Networking Technology (TTNT): PRT Deliveries	2	2018	2	2018
MIDS JTRS Tactical Targeting Networking Technology (TTNT): CFAQT and GFAQT	4	2018	4	2019
MIDS JTRS Tactical Targeting Networking Technology (TTNT): TTNT Technolgy Readiness Review (TRR)	2	2018	2	2018
MIDS JTRS Tactical Targeting Networking Technology (TTNT): Developmental Test/ Operational Assessment	4	2019	4	2020
MIDS JTRS Tactical Targeting Networking Technology (TTNT): Limited Production	2	2020	2	2020
MIDS JTRS Tactical Targeting Networking Technology (TTNT): E-2D DSSC 4 OT/ FOTE	4	2020	4	2021
MIDS JTRS Tactical Targeting Networking Technology (TTNT): Full Production Award	4	2021	4	2021
MIDS JTRS Tactical Targeting Networking Technology (TTNT): IOC	4	2021	4	2021
MIDS Link 16 and TTNT Waveform: Link 16 Waveform Development Fixes and Updates	1	2017	4	2021
MIDS Link 16 and TTNT Waveform: TTNT Waveform Development Fixes and Updates	1	2018	2	2022
MIDS Modernization: MIDS Modernization Spec Development/Risk Reduction	1	2017	2	2018
MIDS Modernization: MIDS Modernization Increment 2 Full Development Effort	3	2018	3	2021
MIDS Modernization: MIDS Mod CFAQT & GFAQT	3	2020	3	2021
MIDS Modernization: MIDS Mod PDR	1	2019	1	2019
MIDS Modernization: MIDS Mod CDR	4	2019	4	2019
MIDS Modernization: MIDS Mod TRR	3	2020	3	2020
MIDS Modernization: MIDS Mod DT/Flight test	3	2021	1	2022
MIDS Modernization: MIDS Mod Verification and Validation	1	2022	3	2022
MIDS Modernization: MIDS Mod Engineering Release (Post DT)	2	2022	2	2022
MIDS Modernization: MIDS Mod DT Report	1	2023	1	2023
MIDS Modernization: MIDS Mod Operational Test Flight	2	2023	3	2023
MIDS Modernization: MIDS Mod Operational Test Report	3	2023	3	2023
MIDS Modernization: MIDS Mod Fleet Release	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 3341 / *Network Tactical Common Data Link*	

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
3341: *Network Tactical Common Data Link*	57.537	28.563	16.229	13.886	-	13.886	49.144	36.289	6.210	6.343	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Network Tactical Common Data Link (NTCDL) provides the ability to transmit/receive real-time Intelligence, Surveillance, and Reconnaissance (ISR) data simultaneously from multiple sources (surface, airborne, sub-surface, man-portable), and exchange command and control information (voice, data, imagery, and Full Motion Video) across dissimilar Joint, Service, Coalition, and Civil networks. NTCDL provides warfighters with the capability to support multiple, simultaneous, networked operations with currently fielded Common Data Link (CDL)-equipped platforms (e.g. F/ A-35, P-3, and MH-60R), in addition to next generation manned and unmanned platforms (e.g., P-8, Triton, MQ-25 (Stingray), and Fire Scout). NTCDL is an incremental capability (surface, airborne, sub-surface, man-portable) providing modular, scalable, multiple-link networked communications. NTCDL benefits the fleet by providing a horizon extension for line-of-sight sensor systems for use in time-critical strike missions. NTCDL counters Anti-Access/Area Denial (A2/AD) through its relay capability, and supports Tasking Collection Processing Exploitation Dissemination (TCPED) through its ISR networking capability. Additionally, NTCDL supports Humanitarian Assistance/Disaster Relief (HA/DR) efforts through its ability to share ISR data across dissimilar Joint, Service, Coalition, and Civil organizations.

FY19 request is for NTCDL product development, to include continued development of two (2) NTCDL Engineering Development Models (EDMs) and associated software.

Network Tactical Common Data Link (NTCDL) High Capacity Backbone (HCB) efforts support Joint Aerial Layer Network-Maritime (JALN-M) System of Systems development, integration, and testing. Efforts included the development of capabilities to integrate shipboard NTCDL terminals with the HCB in an Anti-Access/Area Denial (A2/AD) environment. JALN-M is the Navy implementation of the JALN architecture which provides assured communications in any environment. With disruption or loss of Space tier communications, JALN-M establishes and/or restores connectivity with the HCB tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. Flight test demonstration completed 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: Network Tactical Common Data Link (NTCDL)	14.547	15.729	13.886	0.000	13.886
Articles:	2	-	-	-	-
Description: NTCDL is the only High Data Rate (HDR), Line of Sight (LOS) solution delivering Intelligence, Surveillance, and Reconnaissance (ISR), sensor control information and unmanned aircraft system (UAS) command and control. NTCDL uses Joint Department of Defense specifications for Common Data Link (CDL) waveforms and LOS networks across the allocated CDL frequency spectrum. New technical specifications					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3341 / *Network Tactical Common Data Link*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
require increasing number of simultaneous CDL links to support increasing number of CDL/ISR platforms and missions. The software for NTCDL is developed by both contractor and government. The contractor software development is responsible for the internal control of the NTCDL hardware whereas the Government Furnished Software (GFS) is responsible for interfacing with various external networks (e.g. Automated Digital Network System (ADNS)) and users (e.g. Consolidated Afloat Networks and Enterprise Services (CANES)). ***FY 2018 Plans:*** Conduct Initial Baseline Review (IBR), Preliminary Design Review (PDR), and Critical Design Review (CDR) with the vendor to assess development progress and review and approve the final engineering product baseline. Complete updating the Program Life Cycle Cost Estimate (PLCCE). Continue development of the 2 Engineering Development Models (EDMs) and the contractor-developed link controller subsystem (LCS) software. EDM development is a multi-year effort with delivery planned in FY22. Continue incremental development of the external data user interface (EDUI) and the graphical user interface (GUI) Government Furnished Software (GFS) for the link management system; conduct an In-Process Review (IPR) for delivery of GFS Incremental Capability. Conduct system engineering efforts to support NTCDL development, integration and internal/external software interface management. Continue development of the Navy Training Systems Plan (NTSP). Update the Cost Analysis Requirements Document (CARD), Commence the Test and Evaluation Master Plan (TEMP) update and the Capabilities Production Document (CPD), and continue development of test plans to support future developmental tests and operational assessment (DT/OA). ***FY 2019 Base Plans:*** Continue incremental development of GFS to include the EDUI and GUI for the link management system; conduct an IPR for delivery of GFS Incremental Capability. Continue development of the 2 EDMs and the contractor-developed LCS software. EDM development is a multi-year effort with delivery planned in FY22. Initiate system engineering efforts to support NTCDL development, integration and internal/external software interface management and make necessary updates to the CARD. Continue development of the NTSP and test plans to support future DT/OA. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was reduced by $10 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 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3341 / *Network Tactical Common Data Link*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The $1.8M funding decrease from FY 2018 to FY 2019 (which includes the $10M FY 2019 under execution reductions) will delay the Government Furnished Software (GFS) development, contractor-developed software, EDM development, and systems engineering efforts resulting in a fifteen month delay for EDM delivery.					
Title: Network Tactical Common Data Link (NTCDL) High Capacity Backbone (HCB) ***Articles:*** ***Description:*** Network Tactical Common Data Link (NTCDL) High Capacity Backbone (HCB) efforts support Joint Aerial Layer Network-Maritime (JALN-M) System of Systems development, integration, and testing. Efforts include the development of capabilities to integrate shipboard NTCDL terminals with the HCB in an Anti-Access/ Area Denial (A2/AD) environment. ***FY 2018 Plans:*** FY18 efforts include HCB subject matter experts (SMEs) to support the JALN-M flight tests execution. Flight test demonstration completed in FY18. ***FY 2019 Base Plans:*** N/A ***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 the HCB project.	14.016 -	0.500 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	28.563	16.229	13.886	0.000	13.886

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/2950: *NTCDL OPN, PE: 0205604N*	0.000	0.000	0.000	-	0.000	0.000	0.000	20.048	20.458	Continuing	Continuing

Remarks

D. Acquisition Strategy

NTCDL will utilize the evolutionary acquisition approach for: surface, air, sub-surface, man-portable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3341 / *Network Tactical Common Data Link*

E. Performance Metrics

Conformance to meet Joint Interoperability Test Command (JITC) Certification requirements for CDL waveforms.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 3341 / *Network Tactical Common Data Link*	

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
NTCDL Product Development	C/CPIF	BAE Systems, Int : Wayne, NJ	9.744	9.993	Jun 2017	8.510	Dec 2017	10.114	Jun 2019	-		10.114	Continuing	Continuing	Continuing
NTCDL HCB Development	WR	SPAWARSYSCTR : San Diego, CA	3.203	2.190	Nov 2016	0.500	Nov 2017	0.000		-		0.000	0.000	5.893	5.893
NTCDL HCB Development	C/CPFF	MIT/Lincoln Lab : Lexington, MA	9.556	11.829	Nov 2016	0.000		0.000		-		0.000	0.000	21.385	21.385
NTCDL HCB Development	C/CPFF	DTIC : Fort Belvoir, VA	2.104	0.000		0.000		0.000		-		0.000	0.000	2.104	2.104
NTCDL Software Development	WR	SPAWARSYS : San Diego, CA	1.415	1.659	Nov 2016	1.700	Nov 2017	0.955	Nov 2018	-		0.955	Continuing	Continuing	Continuing
NTCDL Software Development	C/IDIQ	Technology Unlimited Group : San Diego, CA	0.000	0.000		1.743	Jan 2018	0.470	Nov 2018	-		0.470	Continuing	Continuing	Continuing
		Subtotal	26.022	25.671		12.453		11.539		-		11.539	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
NTCDL Systems Engineering	WR	SPAWARSYSCTR : San Diego, CA	13.165	0.907	Nov 2016	0.935	Oct 2017	0.554	Oct 2018	-		0.554	Continuing	Continuing	Continuing
NTCDL Systems Engineering	C/IDIQ	Technology Unlimited Group : San Diego, CA	8.986	0.560	Nov 2016	0.000		0.000		-		0.000	0.000	9.546	9.546
		Subtotal	22.151	1.467		0.935		0.554		-		0.554	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
NTCDL Test and Evaluation	WR	SPAWARSYSCTR : San Diego, CA	4.165	0.656	Oct 2016	1.563	Oct 2017	0.471	Oct 2018	-		0.471	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205604N / *Tactical Data Links*	Project (Number/Name) 3341 / *Network Tactical Common Data Link*

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
NTCDL Test and Review	MIPR	JITC : Fort Huachuca, AZ	0.499	0.015	Dec 2016	0.015	Jan 2018	0.260	Dec 2018	-		0.260	Continuing	Continuing	Continuing
NTCDL Waveform certification	MIPR	COMOPTEVFOR : Norfolk, VA	0.260	0.115	Dec 2016	0.122	Jun 2018	0.205	Dec 2018	-		0.205	Continuing	Continuing	Continuing
		Subtotal	4.924	0.786		1.700		0.936		-		0.936	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	SPAWARSYSCTR : San Diego, CA	1.000	0.000		0.000		0.000		-		0.000	0.000	1.000	1.000
Program Management Support	C/CPFF	BAH : San Diego, CA	3.440	0.639	Nov 2016	1.141	Feb 2018	0.857	Nov 2018	-		0.857	Continuing	Continuing	Continuing
		Subtotal	4.440	0.639		1.141		0.857		-		0.857	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	57.537	28.563		16.229		13.886		-		13.886	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3341 / *Network Tactical Common Data Link*

NTCDL Schedule

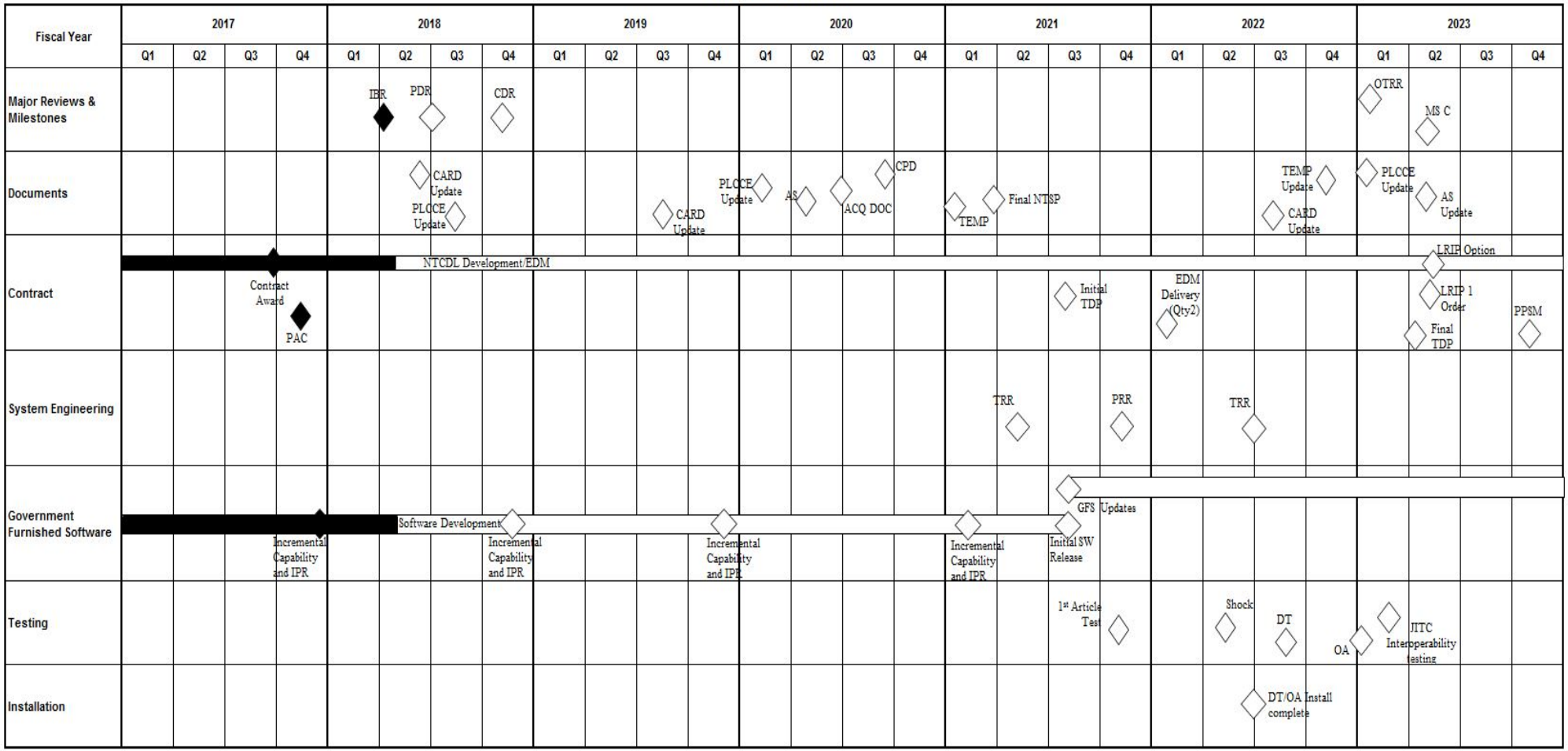


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3341 / *Network Tactical Common Data Link*

JALN-M Demonstration

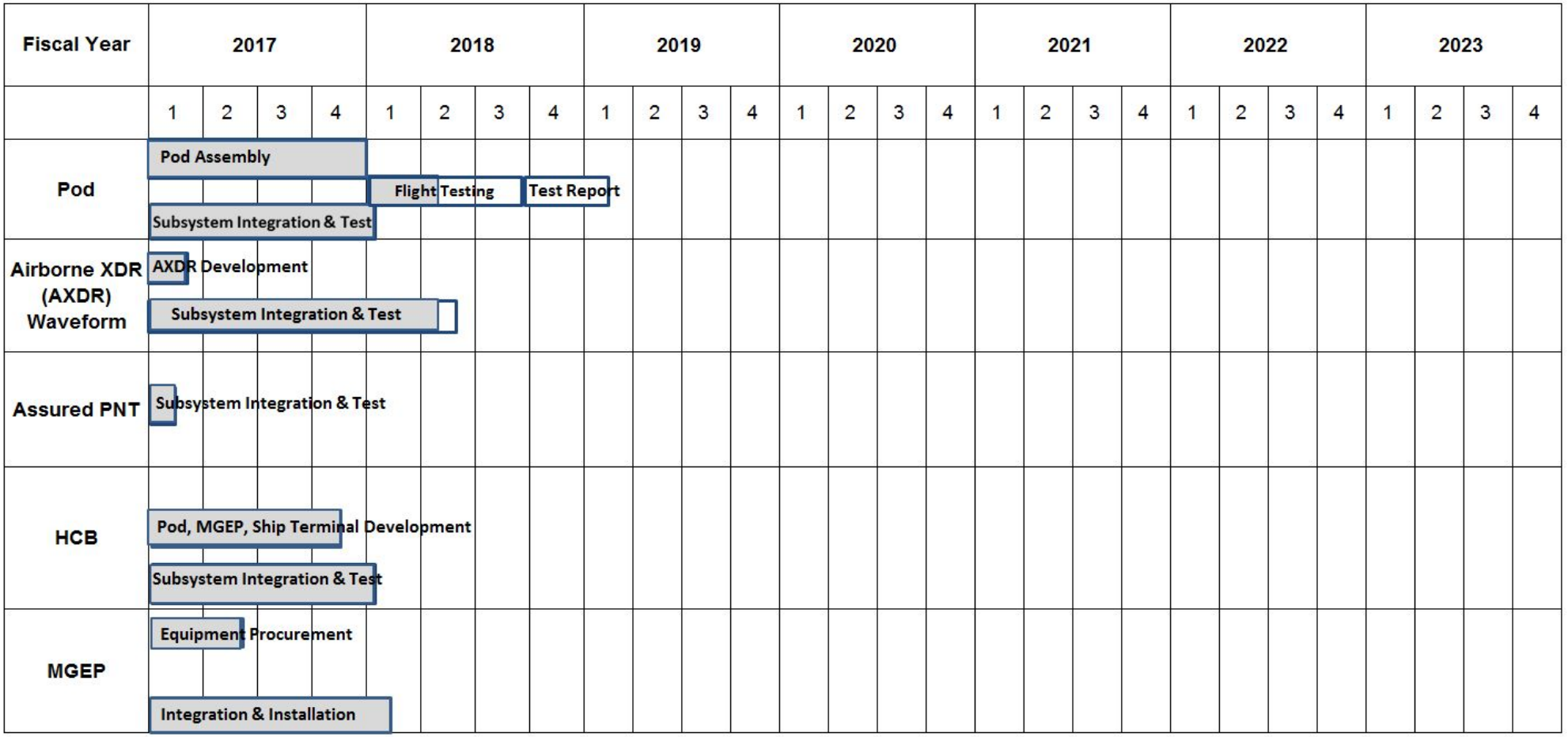


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3341 / *Network Tactical Common Data Link*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3341				
NTCDL - Contract Award	3	2017	3	2017
NTCDL - Development Contract	3	2017	2	2023
NTCDL - Post Award Conference (PAC)	4	2017	4	2017
NTCDL - Government Furnished Software (GFS) Development	1	2017	3	2021
NTCDL - Initial Baseline Review (IBR)	2	2018	2	2018
NTCDL - Preliminary Design Review (PDR)	3	2018	3	2018
NTCDL - Cost Analysis Requirements Document (CARD) Update	2	2018	2	2018
NTCDL - Program Life Cycle Cost Estimate (PLCCE) Update	3	2018	3	2018
NTCDL - Critical Design Review (CDR)	4	2018	4	2018
NTCDL - CARD Update	3	2019	3	2019
NTCDL - PLCCE Update	1	2020	1	2020
NTCDL - Capability Production Document (CPD)	3	2020	3	2020
NTCDL - Test and Evaluation Master Plan (TEMP)	1	2021	1	2021
NTCDL - Final Navy Training Systems Plan (NTSP)	1	2021	1	2021
NTCDL - Test Readiness Review (TRR) 1	2	2021	2	2021
NTCDL - GFS Update	3	2021	4	2023
NTCDL - Production Readiness Review (PRR)	4	2021	4	2021
NTCDL - First Article Test	4	2021	4	2021
NTCDL - Engineering Development Models (EDMs) Delivery	1	2022	1	2022
NTCDL - Development Testing (DT)	3	2022	3	2022
NTCDL - TRR 2	3	2022	3	2022
NTCDL - Operational Test Readiness Reviw (OTRR)	1	2023	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205604N / *Tactical Data Links*	**Project (Number/Name)** 3341 / *Network Tactical Common Data Link*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NTCDL - Operational Assessment (OA)	1	2023	1	2023
NTCDL - Milestone C	2	2023	2	2023
NTCDL - Low Rate Initial Production (LRIP) Order 1	2	2023	2	2023
JALN HCB Integrated Testing	1	2017	1	2018
JALN HCB Development	1	2017	4	2017
JALN HCB Flight Testing	1	2018	3	2018

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205620N *I Surface ASW Cmbt Sys Integr*							
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	239.964	23.779	29.351	28.421	-	28.421	29.766	29.476	30.000	30.629	Continuing	Continuing
1916: *Surface ASW System Improvement*	239.964	23.779	29.351	28.421	-	28.421	29.766	29.476	30.000	30.629	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.115 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 objective of this Program Element (PE) is to significantly improve existing Surface Ship Undersea Warfare (USW) sonar system capabilities through quick and affordable development/integration of emergent, transformational technologies in support of Littoral Anti-Submarine Warfare (ASW), Theater ASW (TASW), and overall efforts required to pace the threat. Detection and classification play uniquely vital roles in the success of any ASW campaign. The Advanced Capability Build (ACB) spiral development process is the primary means by which these USW improvements are developed.

ASW remains a Navy core competency in a dynamic and uncertain maritime environment. U.S. adversaries continue to develop asymmetric capabilities and capacities to deter, disrupt, or delay the entry of U.S. and allied naval forces, and pose a constant challenge as we implement the Maritime Strategy. Evolving submarine technologies offer enhanced stealth, speed, endurance, weapons, and operational proficiency, trends foretelling that the adversary submarine of the future will have a significantly larger sphere of influence, while presenting less vulnerability to ASW forces. The effective offensive engagement range of the adversary submarine of the future will continue to match or outrange individual U.S. and multinational platform sensors and weapons in many tactical environments. Submarines are an increasing threat to all Naval and Allied ships, particularly modern diesel subs and faster torpedoes. Not only can the presence of potential hostile submarines delay naval combatant action until they are located and neutralized, submarines can also disrupt all seaborne logistics supply for any ground campaign as well as maritime commerce. ASW forces must be effective in all operating environments, ranging from the deep open ocean to the littorals, and are key to countering adversarial anti-access and area denial strategies.

This project takes advantage of the AN/SQQ-89(V) Open System Architecture (OSA) and Acoustic Rapid Commercial-Off-The-Shelf (COTS) Insertion (ARCI) initiatives to integrate Torpedo Detection, Classification, and Localization (TDCL) and ASW sonar combat system capability improvements. This COTS-based Surface Ship ASW combat system, the AN/SQQ-89A(V)15, is currently planned as a backfit program for both CG47 (select CG59-73 Baseline 3 and 4 ships) and DDG51 (All DDG and follow FLT I/II/IIA) class ships. The Open Architecture (OA) system enables the ACB process and provides budget flexibility to make COTS/OA technology solutions and ARCI-type initiatives affordable. Improvements are tested in the laboratory and at-sea.

This program will participate in, and take advantage of, the Tactical Advancements for the Next Generation (TANG) initiative that utilizes Commercial Industrial Design Thinking methodologies to engage the Fleet in generating innovative ASW improvement concepts.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205620N *I Surface ASW Cmbt Sys Integr*

ASW technology implementation will take advantage of improvements developed under the submarine Advanced Processing Build (APB) and Advanced Surveillance Build (ASB) programs and will in turn share unique improvements developed under this program with the submarine and surveillance ASW communities. All three programs (ACB, ASB, and APB) are managed under a common development organization and process titled AxB. While each platform retains its uniqueness and focus in functional domains essential to mission success, a premium is placed on development of common capabilities and modular architecture technologies to maximize commonality and cost effectiveness.

This project will also contribute to the development of Littoral Combat Ship (LCS) ASW Mission Packages and the Frigate (FF) Program.

Project 1916 also includes funding for the Surface Ship Engineering Measurement Program (SSEMP), which will measure the performance of existing and new Surface Ship ASW combat systems and enables data-based assessment of the capabilities and shortfalls in the performance of these systems in realistic scenarios.

This project also includes funding to support cyber security initiatives to align future AN/SQQ-89A(V)15 baselines with future AEGIS Integrated Combat Systems

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	24.583	29.351	28.945	-	28.945
Current President's Budget	23.779	29.351	28.421	-	28.421
Total Adjustments	-0.804	0.000	-0.524	-	-0.524
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.788	0.000			
• Program Adjustments	0.000	0.000	-0.151	-	-0.151
• Rate/Misc Adjustments	0.000	0.000	-0.373	-	-0.373
• Congressional General Reductions Adjustments	-0.016	-	-	-	-

Change Summary Explanation

Schedule:

ACB development is now reflected as a continuous pipeline/conveyor process, conducted in parallel to system integration and production. This makes Steps 1 and 2 independent of any particular Build (e.g ACB-15) and allows for development of longer lead technologies.

ACB-15 At-Sea Test has shifted from 3Q17 to 1Q18 due to test ship availability. This shift does not delay delivery to system integrator.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205620N / *Surface ASW Cmbt Sys Integr*	Project (Number/Name) 1916 / *Surface ASW System 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
1916: *Surface ASW System Improvement*	239.964	23.779	29.351	28.421	-	28.421	29.766	29.476	30.000	30.629	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Surface ASW Systems Improvements Project will support essential performance enhancements to AN/SQQ-89(V) and Surface Ship Sonar Systems. This project will improve AN/SQQ-89(V) Measures of Performance (MOP) by enhancing operator interface methods and tools, active and passive detection, tracking, classification and localization, torpedo DCL, and sonobuoy data processing and display capabilities, and increasing acoustic sensor frequency bandwidth (Operational Requirements Document #667-76-05 titled 'AN/SQQ-89 Improvement Program'), Test & Evaluation Master Plan (TEMP) 802-2.

This project will take advantage of the TANG initiative, AN/SQQ-89(V) OSA, and ARCI initiatives to integrate a TDCL and ASW sonar and combat system capability improvements. This COTS-based Surface Ship ASW combat system, the AN/SQQ-89A(V)15, is currently planned as a backfit program for both CG47 (select CG59-73 Baseline 3 and 4 ships) and DDG51 (All DDG51 and follow FLT I/II/IIA) class ships. This project has delivered the AN/SQQ-89A(V)15 Pre-Production Prototype, performed installation on board CG73, and conducted subsequent Developmental Test & Evaluation (DT&E) and Initial Operational Test & Evaluation (IOT&E) where the system was found 'Operationally Effective' by Command Operational Test and Evaluation Force (COMOPTEVFOR).

The OSA and high performance COTS processing hardware on ships fielded with the AN/SQQ-89A(V)15 combat system provides an opportunity to integrate emergent, transformational ASW technological improvements that were previously unachievable. The USW suites on these ships will require periodic upgrades to remain effective well into the 21st century and to pace the threat. Software upgrades target capability increases in high interest areas as prescribed by the Fleet and captured in campaign analysis. To achieve this, this project will package and deliver incremental upgrades every two years to the AN/SQQ-89A(V)15 production program via an ACB spiral development process (ACB-13, ACB-15, etc.) by inserting maturing USW technologies.

Primary areas of USW improvement are as follows:
- Medium Frequency (MF) Pulsed Active Sonar
- Continuous Active Sonar (CAS)
- MF Acoustic Communications
- TDCL
- Torpedo Defense
- Passive Sonar
- Sonar Tactical Decision Aids (STDA)

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

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/SQQ-89A(V)15 Surface Ship ASW Advanced Capability Build (ACB) Development	19.879	21.251	21.154	0.000	21.154
Articles:	-	-	-	-	-
Description: Develop enhancements to the AN/SQQ-89A(V)15 Open System Architecture (OSA) via the integration of transformational technologies through the four step ACB spiral development process, enhanced by the TANG initiative. These items will be integrated and delivered to the CG47 and DDG51 class AN/SQQ-89A(V)15 backfit production programs via ACB updates. The ACB four step process: Step 1 - algorithm/technology assessment by peer review panels of Subject Matter Experts (SME) to down-select technologies and assist developers with technical guidance. Step 2 - algorithm/technology testing with open and closed data sets to further down-select and refine capabilities prior to integration and testing. Step 3 - land based system-level testing in a realistic tactical environment. Step 4 - at-sea testing on an operational surface combatant. Step 4 is conducted only if an appropriate platform is available. ACB requirements are generated through discussions with the Fleet, then vetted and provided as direction by CNO, N96. Beginning in FY 2017, Steps 1 and 2 will be conducted in a pipeline style parallel to system integration and production. This makes Steps 1 and 2 independent of any particular Build (e.g ACB-15) and allows for development of longer lead technologies. The content of a specific ACB build (every two years on the odd year) will then be determined through a series of discussions with the Fleet aimed at selecting the most relevant and mature technologies available in the ACB pipeline. Integration at the String and System level will then be performed followed by Steps 3 and 4, as applicable, and transitioned to production. Additionally, import advanced development capabilities from the submarine APB and ARCI projects. Export advanced capabilities to submarine and surveillance combat system programs. Resolve/troubleshoot issues/deficiencies that arise from the AN/SQQ-89(V) Surface Ship ASW Test & Evaluation program. Rapidly address and correct problems/deficiencies in processing, capability or operations within the following areas within the AN/SQQ-89(V) USW combat system architecture; sensor processing, acoustics, fire control, contact management, performance prediction, operator productivity and on-board training, Multi-Function Towed Array (MFTA), Digital Fire Control Interface (DFCI), MFA processing, TDCL, Torpedo Defense and adaptive beamforming.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

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 Step 4 at-sea testing of ACB-15. - Continue development and integration of enhancements to the AN/SQQ-89A(V)15 for ACB-19. - Conduct system integration and commence test preparation of ACB-19 for Step 3 land-based testing. - Conduct TI-20 trade studies to support ACB-19 integration and ACB-21 development. - Support the conduct of TANG events. - Continue Common STDA development and initiate studies on Next Generation hardware and software architectures with the goals of virtualization and cyber hardening. Virtualization is intended to reduce software integration costs while increasing flexibility. ***FY 2019 Base Plans:*** - Complete TI-20 trade studies to support ACB-19 integration and ACB-21 development. - Conduct and complete Step 3 land-based testing of ACB-19. - Conduct ACB-19 Return-on-Investment (ROI) testing. - Transition ACB-19 to production. - Initiate planning and development for ACB-21. Anticipate developing capabilities to improve the attack/engage phase of the kill chain, improve contact localization, improve sonobuoy processing, and increase performance of a ship as a contributor to strike group performance. - Continue Common STDA development. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 decrease due to general inflation rate adjustments.					
Title: AN/SQQ-89(V) Surface Ship ASW Test & Evaluation Program	0.700	0.700	0.700	0.000	0.700
Articles:	-	-	-	-	-
FY 2018 Plans: - Begin conduct of ACB-13 OT events. - Continue AIE to support ACB-17 certification. - Finalize test ship and resources in support of ACB-15 OT. - Finalize ACB-15 TEMP. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Begin conduct of ACB-15 DT events. - Begin conduct of ACB-15 OT events. - Support conduct of AIE for ACB-17 certification. Work test ship and resources in support of ACB-17 DT&E and ACB-17 TEMP. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** N/A					
Title: Surface Ship Enhanced Measurement Program (SSEMP)	3.200	3.200	3.078	0.000	3.078
Articles:	-	-	-	-	-
Description: Analyze the sonar employment in the operational setting and report results for improvement of training/employment guidance. Perform Fleet exercise data reconstruction and post-test analysis each year. Conduct selected at-sea data collection activities by providing planning support, ship riders, and analyst support. Evaluate prototype sonar employment tactics, sonar processing and automation algorithms, and communication protocols for the detection, classification, tracking, and intra-Fleet hand-off to Fleet ASW assets, and provide summary reports to document results. ***FY 2018 Plans:*** - Support ACB-13 Initial Operational Test and Evaluation (IOT&E)/OT data collection and analysis of operational performance. - Support ACB-15 IOT&E/OT data collection planning. - Continue analysis of real-world SSEMP cases and exercise performance data. ***FY 2019 Base Plans:*** - Conduct ACB-13/ACB-15 Level 4 Operator Test analysis. - Support ACB-15 IOT&E/OT data collection and analysis of operational performance. - Continue analysis of real-world SSEMP cases and exercise performance 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 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY 2019 decrease due to general inflation rate adjustments.					
Title: AN/SQQ-89A(V)15 Cyber Security Architecture Upgrade	0.000	4.200	3.489	0.000	3.489
Articles:	-	-	-	-	-
Description: Cyber security capability development to align future AN/SQQ-89A(V)15 baselines with future AEGIS Integrated Combat Systems.					
FY 2018 Plans: - Align system design plans with the Program Executive Office (PEO) Integrated Warfare Systems (IWS) Cyber Security Instruction 5239.1, incorporate support architecture changes required to meet the current cyber security requirements defined in the Risk Management Framework (RMF), and incorporate capabilities to better align with the Defense-In-Depth Functional Implementation Architecture (DFIA) and Information Assurance (IA) Technical Authority Board Implementation Standards. - Initiate development of cyber security capabilities into AN/SQQ-89A(V)15 Technical Insertion (TI) baselines to support emergent cyber security requirements. These TI's will interface with various Aegis Weapon System (AWS) baselines. - Initiate development of cyber security capabilities into ACBs to support emergent cyber security specifications such as confidentiality and integrity requirements. - Initiate efforts to modernize existing software to reduce the cyber security risks to the weapons control component of the system. - Initiate host level protections and boundary defense capability integration efforts to align with the Secure Combat System Architecture, working towards optimal cyber resiliency.					
FY 2019 Base Plans: - Continue host-level protections and boundary defense capability integration efforts to align with the Secure Combat System Architecture, working towards optimal cyber resiliency. - Support ongoing implementation efforts to sustain integrity and confidentiality requirements. - Support RMF Assessment and Authorization (A&A) activities of various ACB/TI combinations, allowing for continuous successful platform installations.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

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 FY 2019 is due to the planned completion in FY 2018 of the efforts required to study, evaluate, and develop initial plans for Cyber Security Architecture upgrade.					
Accomplishments/Planned Programs Subtotals	23.779	29.351	28.421	0.000	28.421

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/2136: *AN/SQQ-89 Surface ASW Combat System*	87.824	102.222	115.459	-	115.459	125.586	127.452	132.673	135.329	Continuing	Continuing
• RDTEN/0603553N/1704: *Undersea Warfare*	1.039	1.136	1.122	-	1.122	1.145	1.170	1.195	1.220	Continuing	Continuing

Remarks

D. Acquisition Strategy

- Via an ACB spiral development process, incorporate evolutionary and transformational technologies into AN/SQQ-89A(V)15 production systems.
- Utilize the Small Business Innovative Research (SBIR) program and full and open competition for new and improved innovative capability development.

E. Performance Metrics

- Deliver incremental capability increases in high interest areas, as prescribed by the Fleet and captured in campaign analysis, every two years to the AN/SQQ-89A(V)15 production program via an ACB spiral development process (ACB-13, ACB-15, ACB-17, etc.) by inserting maturing USW technologies.
- Conduct system qualification testing (SQT) and Aegis Integration Events (AIE) for all fielded variants of ACB.
- Utilize the SSEMP to evaluate performance of fielded systems.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205620N / *Surface ASW Cmbt Sys Integr*	Project (Number/Name) 1916 / *Surface ASW System 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
SQQ-89 S/W Development/Integration	C/CPFF	AAC : NY	6.505	0.000		0.000		0.000		-		0.000	0.000	6.505	-
SQQ-89 S/W Development/Integration	C/CPFF	Alion : IL	6.913	0.915	Nov 2016	1.250	Nov 2017	1.250	Dec 2018	-		1.250	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	Adaptive Methods : VA	14.825	0.575	Dec 2016	0.605	Jan 2018	0.625	Dec 2018	-		0.625	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	GD-AIS : VA	11.322	0.000		0.000		0.000		-		0.000	0.000	11.322	-
SQQ-89 S/W Development/Integration	C/CPFF	In-Depth Engineering : VA	2.975	0.000		0.000		0.000		-		0.000	0.000	2.975	-
SQQ-89 S/W Development/Integration	C/CPFF	JHU/APL : MD	31.877	6.059	Nov 2016	6.100	Feb 2018	6.100	Dec 2018	-		6.100	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	Metron : VA	4.950	0.500	Nov 2016	0.600	Nov 2017	0.600	Dec 2018	-		0.600	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	Lockheed Martin : NY	10.205	0.000		0.000		0.000		-		0.000	0.000	10.205	-
SQQ-89 S/W Development/Integration	C/CPFF	Lockheed Martin : VA	16.055	3.658	Dec 2016	3.650	Jan 2018	3.650	Dec 2018	-		3.650	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	WR	NSWC/Carderock : MD	7.527	0.250	Jan 2017	0.250	Jan 2018	0.246	Nov 2018	-		0.246	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	WR	NSWC/Dahlgren : VA	1.440	0.000		0.000		0.000		-		0.000	0.000	1.440	-
SQQ-89 S/W TDA Support	WR	NUWC/Newport : RI	13.670	2.822	Jan 2017	2.970	Nov 2017	2.963	Nov 2018	-		2.963	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	Sedna Digital : VA	4.300	0.105	Feb 2017	0.100	Feb 2018	0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	UT/ARL : TX	16.693	1.975	Nov 2016	1.950	Feb 2018	1.950	Dec 2018	-		1.950	Continuing	Continuing	Continuing
SQQ-89 S/W Development/Integration	C/CPFF	VAR : VAR*	23.795	2.712	Dec 2016	3.468	Dec 2017	3.398	Dec 2018	-		3.398	Continuing	Continuing	Continuing
SAST Development/ Integration	C/CPFF	JHU/APL : MD	8.302	0.000		0.000		0.000		-		0.000	0.000	8.302	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205620N / *Surface ASW Cmbt Sys Integr*	Project (Number/Name) 1916 / *Surface ASW System 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
SAST Development/ Integration	WR	NSWC/Carderock : MD	13.493	0.000		0.000		0.000		-		0.000	0.000	13.493	-
SAST Development/ Integration	WR	NUWC/Newport : RI	3.080	0.000		0.000		0.000		-		0.000	0.000	3.080	-
SAST Development/ Integration	C/CPFF	Sedna Digital : VA	5.002	0.000		0.000		0.000		-		0.000	0.000	5.002	-
SAST Development/ Integration	C/CPFF	UT/ARL : TX	1.652	0.000		0.000		0.000		-		0.000	0.000	1.652	-
SAST Development/ Integration	C/CPFF	VAR : VAR*	0.812	0.000		0.000		0.000		-		0.000	0.000	0.812	-
SQQ-89 CyberSecurity Development/Integration	C/CPFF	Lockheed Martin : VA	0.000	0.000		3.360	Jan 2018	2.800	Dec 2018	-		2.800	0.000	6.160	-
SQQ-89 CyberSecurity Development/Integration	WR	NSWC/Dahlgren : VA	0.000	0.000		0.630	Jan 2018	0.517	Nov 2018	-		0.517	0.000	1.147	-
SQQ-89 CyberSecurity Development/Integration	WR	NUWC/Newport : RI	0.000	0.000		0.210	Nov 2017	0.172	Nov 2018	-		0.172	0.000	0.382	-
		Subtotal	205.393	19.571		25.143		24.371		-		24.371	Continuing	Continuing	N/A

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

Note: SAST Development/Integration cost category is not used effective FY17. SAST was developed stand-alone, but has been integrated into the AN/SQQ-89 ACB baseline.

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
SSEMP ConductTest/Data Evaluation	C/CPFF	JHU/APL : MD	16.165	2.100	Nov 2016	2.100	Feb 2018	2.025	Dec 2018	-		2.025	Continuing	Continuing	Continuing
SSEMP Conduct/Test/ Data Evaluation	WR	NUWC/Newport : RI	3.912	0.500	Jan 2017	0.500	Nov 2017	0.475	Nov 2018	-		0.475	Continuing	Continuing	Continuing
SSEMP Conduct/Test/ Data Evaluation	C/CPFF	UT/ARL : TX	4.878	0.600	Nov 2016	0.600	Feb 2018	0.578	Dec 2018	-		0.578	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

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
SQQ-89 IV&V/SAT/TEMP Assess./Update	WR	NUWC/Newport : RI	2.826	0.400	Jan 2017	0.400	Nov 2017	0.400	Nov 2018	-		0.400	Continuing	Continuing	Continuing
SQQ-89 DT/OT/ Miscellaneous T&E	WR	VAR : VAR*	2.685	0.300	Dec 2016	0.300	Feb 2018	0.300	Dec 2018	-		0.300	Continuing	Continuing	Continuing
		Subtotal	30.466	3.900		3.900		3.778		-		3.778	Continuing	Continuing	N/A

Remarks

*Consists of multiple performing activities with funding for each not greater than $1M per year.

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	BAE Systems : MD	2.999	0.000		0.000		0.000		-		0.000	0.000	2.999	-
Program Management Support	C/CPIF	CGI Federal : VA	0.250	0.250	Nov 2016	0.250	Feb 2018	0.214	Dec 2018	-		0.214	Continuing	Continuing	Continuing
Program Office Travel	Allot	NAVSEA PEO IWS5 : DC	0.856	0.058	Nov 2016	0.058	Feb 2018	0.058	Oct 2018	-		0.058	Continuing	Continuing	Continuing
		Subtotal	4.105	0.308		0.308		0.272		-		0.272	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	239.964	23.779		29.351		28.421		-		28.421	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

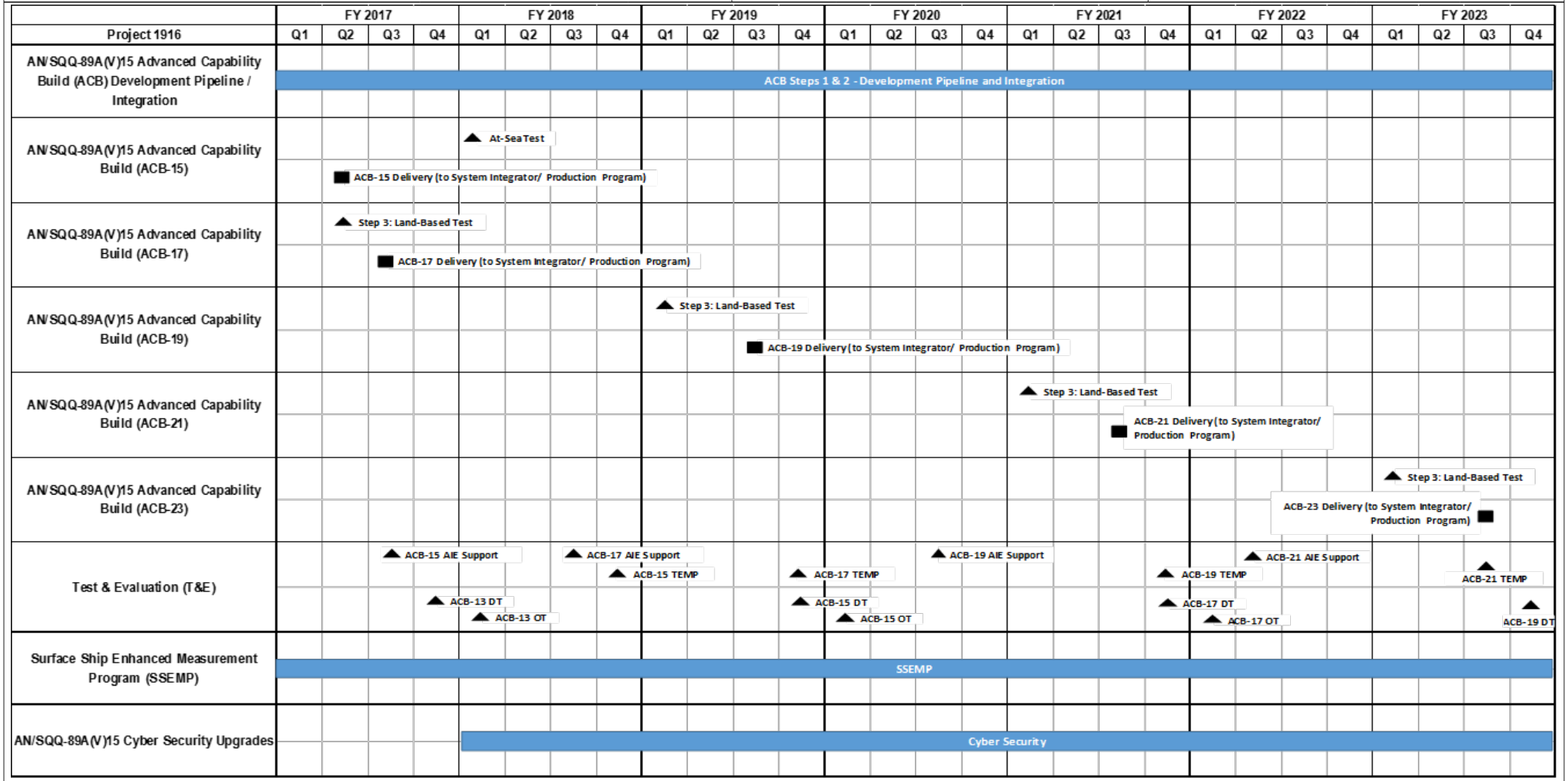


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1916				
AN/SQQ-89A(V)15 Advanced Capability Build: AN/SQQ-89A(V)15 Advanced Capability Build Development Pipleline	1	2017	4	2023
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-15): AN/SQQ-89A(V)15 ACB-15 Step 4 At-Sea Test	1	2018	1	2018
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-15): AN/SQQ-89A(V)15 ACB-15 S/W Delivery to Integrator	2	2017	2	2017
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-17): AN/SQQ-89A(V)15 ACB-17 Step 3 Land-Based Test (LBT)	2	2017	2	2017
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-17): AN/SQQ-89A(V)15 ACB-17 S/W Delivery to Integrator	3	2017	3	2017
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-19): AN/SQQ-89A(V)15 ACB-19 Step 3 Land-Based Test (LBT)	1	2019	1	2019
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-19): AN/SQQ-89A(V)15 ACB-19 S/W Delivery to Integrator	3	2019	3	2019
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-21): AN/SQQ-89A(V)15 ACB-21 Step 3 Land-Based Test (LBT)	1	2021	1	2021
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-21): AN/SQQ-89A(V)15 ACB-21 S/W Delivery to Integrator	3	2021	3	2021
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-23): AN/SQQ-89A(V)15 ACB-23 Step 3 Land-Based Test (LBT)	1	2023	1	2023
AN/SQQ-89A(V)15 Advanced Capability Build (ACB-23): AN/SQQ-89A(V)15 ACB-23 S/W Delivery to Integrator	3	2023	3	2023
Test & Evaluation: AN/SQQ-89A(V)15 ACB-13 Developmental Test (DT)	4	2017	4	2017
Test & Evaluation: AN/SQQ-89A(V)15 ACB-13 Operational Test (OT)	1	2018	1	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205620N / *Surface ASW Cmbt Sys Integr*	**Project (Number/Name)** 1916 / *Surface ASW System Improvement*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 Aegis Integration Event (AIE)	3	2017	3	2017
Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 T&E Master Plan (TEMP)	4	2018	4	2018
Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 Developmental Test (DT)	4	2019	4	2019
Test & Evaluation: AN/SQQ-89A(V)15 ACB-15 Operational Test (OT)	1	2020	1	2020
Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 Aegis Integration Event (AIE)	3	2018	3	2018
Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 T&E Master Plan (TEMP)	4	2017	4	2017
Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 Developmental Test (DT)	4	2021	4	2021
Test & Evaluation: AN/SQQ-89A(V)15 ACB-17 Operational Test (OT)	1	2022	1	2022
Test & Evaluation: AN/SQQ-89A(V)15 ACB-21 Aegis Integration Event (AIE)	2	2022	2	2022
Test & Evaluation: AN/SQQ-89A(V)15 ACB-21 T&E Master Plan (TEMP)	3	2023	3	2023
Test & Evaluation: AN/SQQ-89A(V)15 ACB-19 Aegis Integration Event (AIE)	3	2020	3	2020
Surface Ship Enhanced Measurement Program (SSEMP): AN/SQQ-89A(V)15 ACB-19 Developmental Test (DT)	4	2023	4	2023
Surface Ship Enhanced Measurement Program (SSEMP): AN/SQQ-89A(V)15 ACB-19 T&E Master Plan (TEMP)	4	2021	4	2021
Surface Ship Enhanced Measurement Program (SSEMP): Surface Ship Enhanced Measurement Program (SSEMP)	1	2017	4	2023
AN/SQQ-89A(V)15 Cyber Security Upgrades: AN/SQQ-89A(V)15 Cyber Security Upgrades	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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205632N *I MK-48 ADCAP*

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	300.636	48.507	68.553	94.155	-	94.155	87.224	109.208	111.359	113.767	Continuing	Continuing
0366: *MK 48 ADCAP*	295.326	38.835	68.553	94.155	-	94.155	87.224	109.208	111.359	113.767	Continuing	Continuing
9999: *Congressional Adds*	5.310	9.672	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.982

A. Mission Description and Budget Item Justification

MK-48 ADCAP (Advanced Capability) Research, Development, Test and Evaluation (RDT&E) program executes incremental development of weapon performance improvements in three development product areas: (1) Common Broadband Advanced Sonar System (CBASS), (2) Advanced Processor Builds (APBs), and (3) Torpedo Technology Insertion (TI). This Program Element (0205632N/0366) is tied to development programs that leverage a joint United States/Australia Armaments Cooperative Project (ACP) to develop MK-48 ADCAP CBASS; and Future Naval Capability (FNC) technologies developed by the Office of Naval Research (ONR).

Countermeasure (CM) sophistication and availability on the open market directly affects ADCAP kill proficiency and its ability to counter rapidly evolving threats. The focus of the MK-48 ADCAP Torpedo Research and Development (R&D) program beginning FY 2001 shifted from concentrating primarily on software block upgrade efforts towards coordinated hardware upgrades, rapid Commercial-Off-the-Shelf (COTS) insertion, and APBs, in order to rapidly upgrade the ADCAP to counter evolving threats and maintain robust performance. The CBASS program developed and fielded a broadband sonar capable of identifying CMs and discriminating them from the target. CBASS Phase I achieved IOC in FY 2006. The Royal Australian Navy (RAN) is jointly participating to develop CBASS Phase II to improve shallow water performance and signed a Memorandum of Agreement (MOA) extension November 2009. The Memorandum Of Agreement (MOA) extension expires November 2019.

The MK-48 ADCAP Torpedo R&D program focuses on two specific areas near term; Torpedo APBs and hardware tech insertions. The CNO continues to stress shallow water (less than 600 feet) as a critical operating area to counter third world diesel electric submarines. Torpedo testing in shallow water has demonstrated that in-service ADCAP has less than full capability in this difficult environment. However, this testing, in conjunction with laboratory simulation efforts, has shown that significant performance improvements can be made by implementing changes to weapon tactics and software algorithms. Development, implementation, and testing of these changes are being accomplished under the Torpedo APB program. The APB program also leverages the RAN joint torpedo program and FNC technologies developed by the ONR in the areas of torpedo broadband signal processing, tactics processing, and alertment. The Torpedo tech insertion program will leverage the MK-54 Lightweight torpedo algorithms.

The Torpedo Technology Insertion program will provide for evolutionary torpedo improvements and upgrades (including the transition and testing of advanced technologies from the R&D community). This approach will incorporate developmental testing of the FNC transitioning technologies for ADCAP upgrades in the areas of torpedo sensors, weapon/platform connectivity, improve fusing, and an alternate method of homing. These efforts will continue torpedo development investment at a lower cost and shorter term than traditional torpedo programs.

The MK 48 MOD 7 APB6/TI-1 Heavyweight Torpedo (HWT) program is an evolutionary upgrade to the MK 48 MOD 7 HWT; it will consist of an Operational Software (OPSW) upgrade referred to as APB 6 and a hardware upgrade referred to as TI-1. TI-1 will include a Guidance and Control (G&C) section upgrade, a redesigned

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205632N *I MK-48 ADCAP*

TI-1 Warhead Electronics System (WES), and an Improved Post Launch Communications System (IPLCS). TI-1 will also include features from three Future Naval Capabilities (FNC) programs: ASuW weapon upgrades, Extended Range Modular Undersea Heavyweight Vehicle (ER MUHV) and Torpedo Common Hybrid Fuzing System (Fuze).

APB5 software upgrades are currently in process for MK-48 ADCAP torpedoes.
APB5+ software upgrades are currently in process for MK-48 ADCAP torpedoes. APB5+ enhancements are required to address Combat Control System (CCS)/MK48 pre and post launch interface issues which limit crew full implementation of the weapon and provide numerous capability enhancements requested and endorsed by the Fleet.

Both FNC technologies and MK-54 LWT developments will be transitioned into ADCAP through APBs and technology insertion packages. Priorities for APBs and technology insertion are: (1) improved torpedo effectiveness through advanced processing algorithms, (2) advanced counter-countermeasure capability, and (3) a new array to improve torpedo effectiveness.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	39.134	68.553	95.983	-	95.983
Current President's Budget	48.507	68.553	94.155	-	94.155
Total Adjustments	9.373	0.000	-1.828	-	-1.828
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.621	0.000			
• Rate/Misc Adjustments	0.000	0.000	-1.828	-	-1.828
• Congressional General Reductions Adjustments	-0.006	-	-	-	-
• Congressional Add Adjustments	10.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Program Increase*	9.672	0.000
Congressional Add Subtotals for Project: 9999	9.672	0.000
Congressional Add Totals for all Projects	9.672	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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205632N *I MK-48 ADCAP*

Change Summary Explanation

The FY 2019 funding request was reduced by $0.375 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 2019 decrease of $1.453 in rate/miscellaneous adjustments were due to rate and purchase price inflation changes.

FY 2019: Program increase is primarily due to the TI-1 Hardware development contract and APB 6 software development.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205632N / *MK-48 ADCAP*	Project (Number/Name) 0366 / *MK 48 ADCAP*	

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
0366: *MK 48 ADCAP*	295.326	38.835	68.553	94.155	-	94.155	87.224	109.208	111.359	113.767	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MK48 ADCAP program executes incremental development of weapon performance improvements in two development product areas: (1) APBs, and (2) torpedo technology insertion. This program is tied to development programs that leverage a joint United States/Australia ACP to develop MK48 ADCAP and FNC technologies being developed by the ONR.

APB software upgrades will improve torpedo performance in challenging shallow water and countered environments through incorporation of new algorithms designed to address broadband, multiband, classifications and tactics processing changes. Hardware technology insertions will improve weapon performance against slow/low doppler targets. It provides improved target detection at long and short ranges and improved counter measure rejection in countered and shallow water scenarios.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: TORPEDO APB	26.412	47.567	77.432	0.000	77.432
Articles:	-	-	-	-	-
FY 2018 Plans:					
APB6/TI-1 - Continue APB 6 software development.					
APB6/TI-1 - Continue TI-1 hardware development.					
APB6/TI-1 - Continue Weapons Analysis Facility (WAF) upgrades and accreditation.					
APB6/TI-1 - Continue Fiber development.					
APB6/TI-1 - Conduct APB6/TI-1 Integrated Logistics Assessment.					
APB6/TI-1 - Conduct APB/TI-1 Milestone B Review.					
APB6/TI-1 - Award TI-1 Development Contract.					
APB5+ - System Requirements Review (SRR)					
APB5+ - Software System Safety Technical Review Panel (SSSTRP) Briefing					
APB5+ - Software - Build 1 (pre-launch)					
FY 2019 Base Plans:					
APB6/TI-1 - Continue APB 6 Software development.					
APB6/TI-1 - Conduct APB 6 System Functional Review (SFR)					
APB6/TI-1 - Continue TI-1 hardware development.					
APB6/TI-1 - Conduct TI-1 System Requirements Review.					
APB6/TI-1 - Conduct TI-1 System Functional Review.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205632N / *MK-48 ADCAP*	**Project (Number/Name)** 0366 / *MK 48 ADCAP*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
APB6/TI-1 - Continue Weapons Analysis Facility (WAF) upgrades and accreditation. APB5+ - Preliminary Design Review (PDR) APB5+ - Software - Build 2 (post-launch) ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $24.3M for TI-1 Hardware development contract. TI-1 hardware contractor estimate is based on a labor burn rate of $3M/mo and estimated material requirement of $12M in FY 2019. Increase of $6M for NUWC APB 6 software development. As APB 5 shifts to OT in FY 2019, APB 6 software development is increased in order to meet software/hardware developmental testing.					
Title: TEST & EVALUATION	12.423	20.986	16.723	0.000	16.723
Articles:	-	-	-	-	-
FY 2018 Plans: Begin APB 5 Operational Testing (OT) events OT-A and OT-B with analysis and reports for each event. Begin EC-WAF accreditation. ***FY 2019 Base Plans:*** APB 5 - Continue APB 5 Operational Test events (OT-C, OT-D, OT-E). APB 6 - Begin preliminary APB 6 Software Integration testing. Complete EC-WAF accreditation. APB5+ - Engineering test runs using EC-WAF / CSTL virtual shots ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding decrease due to reduced in water test events in FY19 resulting in less test range time and support required and fewer torpedo builds needed. NUWC Newport support reduced by $2.4M and NUWC Keyport support reduced $1.6M.					
Accomplishments/Planned Programs Subtotals	38.835	68.553	94.155	0.000	94.155

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205632N / *MK-48 ADCAP*	**Project (Number/Name)** 0366 / *MK 48 ADCAP*

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/3225: *MK-48 Torpedo ADCAP Mods*	46.139	38.954	40.005	-	40.005	40.173	57.079	58.181	59.408	0.000	1,479.646
• WPN/3117: *MK-48 Torpedo*	43.037	44.771	92.616	-	92.616	114.436	218.661	186.660	199.409	Continuing	Continuing

Remarks

D. Acquisition Strategy

In FY 2016, a competitive contract was awarded to procure additional warshot torpedoes and continue procurement of CBASS Kits. The Program will continue to execute competitive, build to print contracts, until inventory requirements are met and all Mod 6 torpedoes are converted. Throughout the contract the program will execute life of type buys to minimize the impact of obsolescence avoiding redesign and qualification during a contract cycle. The next competitive contract is planned for FY 2021 and will include fuel tank and warhead electronic sections.

Continue to incrementally develop technology to pace the threats to be integrated into the production baseline. A competitive award for TI-1 hardware development is planned for FY 2018.

E. Performance Metrics

Milestone reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205632N / *MK-48 ADCAP*	**Project (Number/Name)** 0366 / *MK 48 ADCAP*

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 - APB 5	WR	NUWC NPT : Newport RI	21.452	8.979	Oct 2016	5.552	Oct 2017	3.243	Oct 2018	-		3.243	Continuing	Continuing	Continuing
Primary Software Development - APB 6	WR	NUWC NPT : Newport RI	0.000	1.671	Jan 2017	6.554	Oct 2017	12.810	Oct 2018	-		12.810	0.000	21.035	-
Primary Hardware Development - TI-1	WR	NUWC NPT : Newport RI	14.880	5.328	Oct 2016	9.369	Oct 2017	11.211	Oct 2018	-		11.211	Continuing	Continuing	Continuing
Hardware Development - TI-1	C/CPIF	New - TBD : TBD	0.000	0.000		20.411	Jun 2018	44.679	Jul 2019	-		44.679	0.000	65.090	-
Primary Hardware Development - TI-1	C/CPFF	UARC : Multiple	0.000	0.300	Feb 2017	0.300	Mar 2018	0.100	Mar 2019	-		0.100	0.000	0.700	-
Primary Hardware Development - TI-1	WR	Indian Head : Indian Head	0.000	0.000		0.100	Oct 2017	0.100	Oct 2018	-		0.100	0.000	0.200	-
Primary Hardware Development - IM	WR	Indian Head : Indian Head	0.900	0.450	Oct 2016	0.450	Jan 2018	0.450	Jan 2019	-		0.450	Continuing	Continuing	Continuing
Primary Hardware Development - Spiral 4 / PY Development	WR	NUWC NPT : Newport RI	31.201	0.000		0.000		0.000		-		0.000	0.000	31.201	-
Primary Software Development - Sprial 4 / PY Development	WR	NUWC NPT : Newport RI	31.839	0.000		0.000		0.000		-		0.000	0.000	31.839	-
		Subtotal	100.272	16.728		42.736		72.593		-		72.593	Continuing	Continuing	N/A

Remarks

Funding increase required for TI-1 hardware development contractor and APB 6 software development. TI-1 hardware contractor estimate is based on a labor burn rate of $3M/mo and estimated material requirement of $12M in FY19.

As APB 5 shifts to OT in FY19, APB 6 software development is increased in order to meet software/hardware developmental 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
Software Development - APB 5	WR	NUWC NPT : Newport RI	26.605	4.038	Oct 2016	3.368	Oct 2017	2.192	Oct 2018	-		2.192	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205632N / *MK-48 ADCAP*	Project (Number/Name) 0366 / *MK 48 ADCAP*	

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 - APB 6	WR	NUWC NPT : Newport RI	0.000	0.251	Jan 2017	0.917	Oct 2017	2.086	Oct 2018	-		2.086	0.000	3.254	-
Software Development / PY Development	Various	Various : Not Specified	36.317	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Integrated Logistics Support	WR	NUWC NPT : Newport RI	2.243	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering WCF	WR	NUWC NPT : Newport RI	17.750	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering	Various	NUWC NPT : Newport RI	0.676	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	83.591	4.289		4.285		4.278		-		4.278	Continuing	Continuing	N/A

Remarks

Support funds are shifting from APB 5 support to APB 6 support 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 - APB 5	WR	NUWC NPT : Newport RI	9.336	6.468	Oct 2016	10.749	Oct 2017	7.995	Oct 2018	-		7.995	Continuing	Continuing	Continuing
Test & Evaluation - APB 5	WR	NUWC KPT : Keyport WA	17.347	8.448	Oct 2016	6.670	Oct 2017	5.114	Oct 2018	-		5.114	Continuing	Continuing	Continuing
Test & Evaluation - APB 5	WR	OPTEVFOR : Norfolk VA	9.815	0.550	Jul 2017	2.000	Jun 2018	2.000	May 2019	-		2.000	Continuing	Continuing	Continuing
Test & Evaluation - APB 6	C/CPFF	ARL / PSU : State College PA	0.000	0.298	Apr 2017	1.567	Apr 2018	1.614	Apr 2019	-		1.614	0.000	3.479	-
Modeling & Simulation	WR	NUWC NPT : Newport RI	9.745	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Modeling & Simulation	C/CPFF	ARL / PSU : State College PA	12.590	1.522	Apr 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test & Evaluation - Spiral 4 / PY	WR	NUWC NPT : Newport RI	17.086	0.000		0.000		0.000		-		0.000	0.000	17.086	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205632N / *MK-48 ADCAP*	Project (Number/Name) 0366 / *MK 48 ADCAP*	

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 - Spiral 4 / PY	WR	NUWC KPT : Keyport WA	29.437	0.000		0.000		0.000		-		0.000	0.000	29.437	-
		Subtotal	105.356	17.286		20.986		16.723		-		16.723	Continuing	Continuing	N/A

Remarks

Decrease funding required due to less in water test events in FY19.
Modeling and simulation is funded under EC-WAF within APB development T&E tasks.

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	Alion Science : Mclean VA	4.858	0.482	Oct 2016	0.496	Nov 2017	0.511	Dec 2018	-		0.511	0.000	6.347	-
Travel	WR	NAVSEA : Washington DC	1.249	0.050	Oct 2016	0.050	Nov 2017	0.050	Dec 2018	-		0.050	0.000	1.399	-
		Subtotal	6.107	0.532		0.546		0.561		-		0.561	0.000	7.746	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	295.326	38.835		68.553		94.155		-		94.155	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205632N / *MK-48 ADCAP*	**Project (Number/Name)** 0366 / *MK 48 ADCAP*

MK 48 MOD 7 APB5 Acquisition Schedule

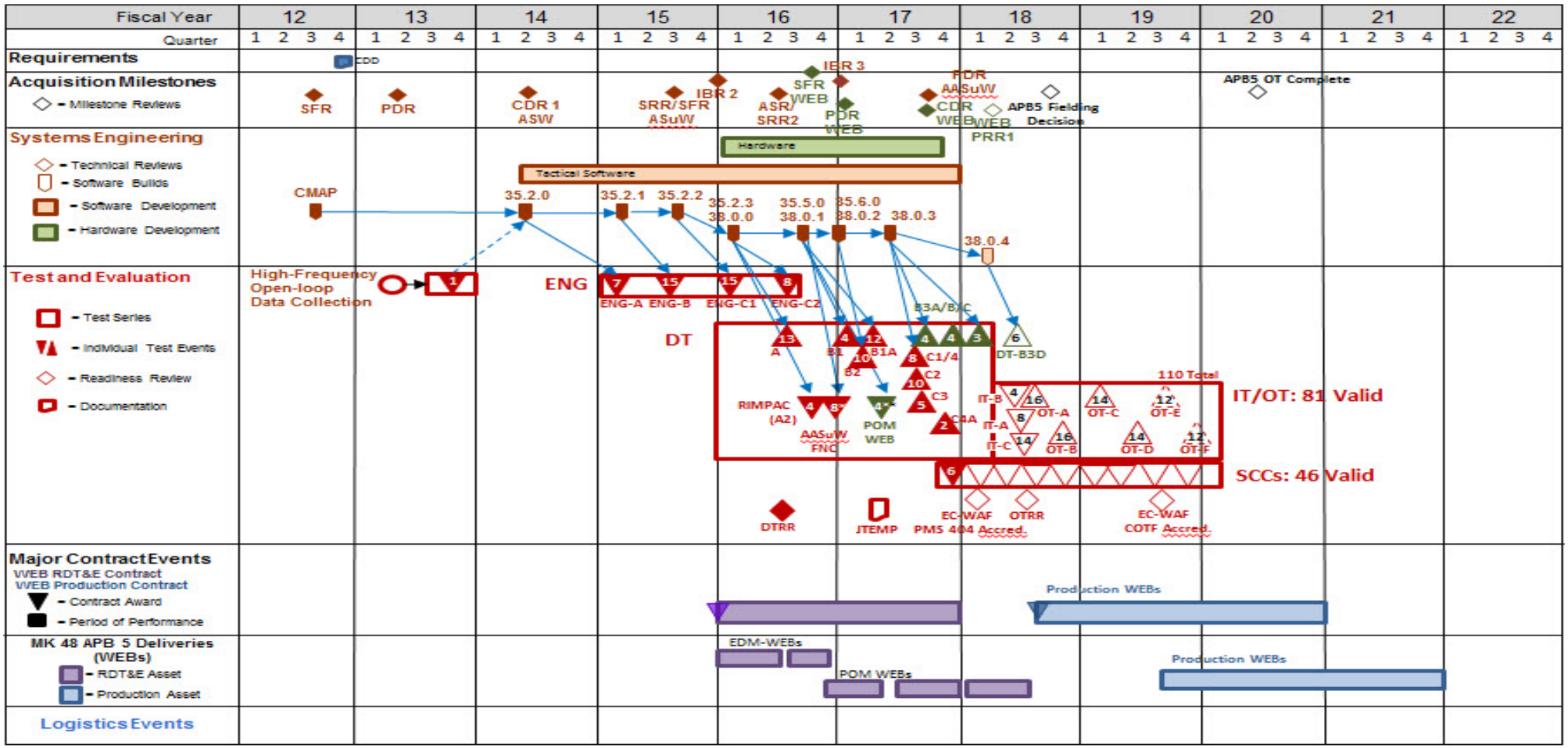


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205632N / *MK-48 ADCAP*	**Project (Number/Name)** 0366 / *MK 48 ADCAP*

MK 48 APB6/TI-1 Acquisition Schedule

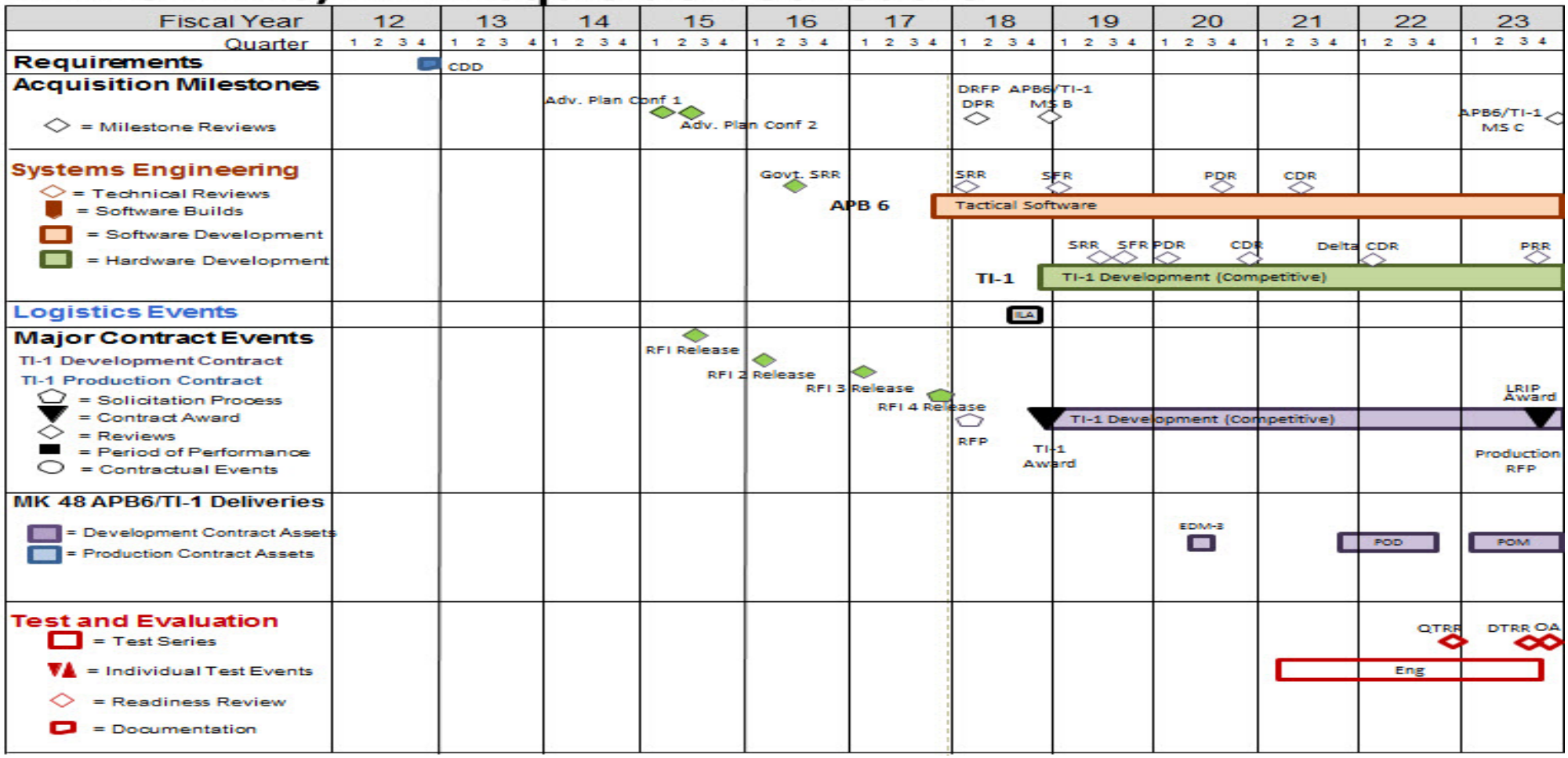


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205632N / *MK-48 ADCAP*	**Project (Number/Name)** 0366 / *MK 48 ADCAP*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0366				
APB 5 Development: Continue APB 5 Developmental Test (DT)	1	2017	1	2018
APB 5 Development: APB 5 Operation Test (IT/OT)	2	2018	1	2020
APB 5 Development: APB 5 IOC	2	2020	2	2020
APB 6 Software / TI-1 Hardware Development: APB 6 Development	1	2017	4	2023
APB 6 Software / TI-1 Hardware Development: TI-1 Development	4	2018	4	2023
APB 6 Software / TI-1 Hardware Development: APB 6/TI-1 Developmental Test (DT)	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205632N / *MK-48 ADCAP*	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*	5.310	9.672	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	14.982
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Congressional add funding will be utilized to address obsolescence, manufacturability and product improvements to reduce assembly cost and address production issues.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Program Increase	9.672	0.000
FY 2017 Accomplishments: N/A		
FY 2018 Plans: (1) Contract and Technical Support of the Acoustic Transducer Manufacturing Automation System, (2) Improve battery life or improving pinger electronics to draw less power		
Congressional Adds Subtotals	9.672	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Milestone review

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205632N / *MK-48 ADCAP*	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
Primarily Software Development	WR	NUWC NPT : Newport RI	5.310	9.672	Sep 2017	0.000		0.000		-		0.000	0.000	14.982	-
		Subtotal	5.310	9.672		0.000		0.000		-		0.000	0.000	14.982	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	5.310	9.672		0.000		0.000		-		0.000	0.000	14.982	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205632N / *MK-48 ADCAP*	**Project (Number/Name)** 9999 / *Congressional Adds*

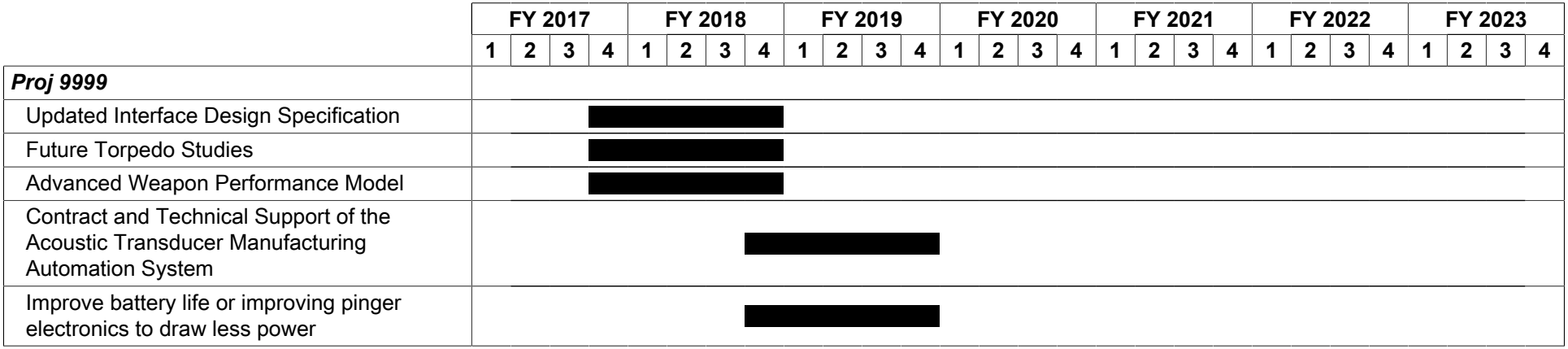


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205632N / *MK-48 ADCAP*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
Updated Interface Design Specification	4	2017	4	2018
Future Torpedo Studies	4	2017	4	2018
Advanced Weapon Performance Model	4	2017	4	2018
Contract and Technical Support of the Acoustic Transducer Manufacturing Automation System	4	2018	4	2019
Improve battery life or improving pinger electronics to draw less power	4	2018	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* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205633N / *Aviation 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	1,338.992	121.138	119.099	121.805	-	121.805	127.327	121.266	120.453	124.357	Continuing	Continuing
0601: *Acft Handling & Service Equip*	31.486	2.619	2.722	4.868	-	4.868	6.778	3.093	2.748	4.804	Continuing	Continuing
0852: *Consolidated Auto Support System*	161.389	6.308	6.661	6.734	-	6.734	6.539	6.638	6.762	6.915	Continuing	Continuing
1041: *Acft Equip Repl/Maint Prog*	49.999	8.223	3.356	3.369	-	3.369	3.433	3.517	3.583	3.654	Continuing	Continuing
1355: *Propulsion and Power Component Improvement Program*	1,054.223	89.303	94.001	105.223	-	105.223	108.500	107.164	107.355	108.984	Continuing	Continuing
2269: *Expeditionary Airfield Improvements*	41.895	14.685	12.359	1.611	-	1.611	2.077	0.854	0.005	0.000	0.000	73.486

A. Mission Description and Budget Item Justification

Project 0601 - Common Ground Equipment is a Naval Aviation Project to apply new technology to common support equipment necessary to support multiple aircraft.

Project 0852: Consolidated Automated Support System is a standardized Automated Test Equipment with computer assisted, multi-function capabilities to support the maintenance of aircraft weapons systems and missiles.

Project 1041 - Aircraft Equipment Reliability/Maintainability Improvement Program is the only Navy program that provides engineering support for in-service out-of-production aircraft equipment, and provides increased readiness at reduced operational and support cost.

Project 1355 - Aircraft Engine Component Improvement Program develops reliability and maintainability and safety enhancements for in-service Navy aircraft engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, fuel systems, fuels, and lubricants.

Project 2269 - The Expeditionary Airfields (EAF) program designs, develops, tests and fields a sustainment lighting system to replace existing obsolete legacy EAF lighting system.

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.

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 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0205633N *I Aviation Improvements*			
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	120.861	119.099	122.717	-	122.717
Current President's Budget	121.138	119.099	121.805	-	121.805
Total Adjustments	0.277	0.000	-0.912	-	-0.912
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.999	0.000			
• SBIR/STTR Transfer	-2.714	0.000			
• Program Adjustments	0.000	0.000	-1.036	-	-1.036
• Rate/Misc Adjustments	0.000	0.000	0.124	-	0.124
• Congressional General Reductions Adjustments	-0.008	-	-	-	-
• Congressional Directed Reductions Adjustments	-2.000	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by $5.459 million to account for the availability of prior year execution balances.

The FY 2019 funding request was reduced by $0.674 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:

Project 0601: Name change from Carrier Crash Crane (CV) to Carrier/Amphibious Assault Ship Crash Crane (CV/AACC) due to adding the amphibious assault ship back to the procurement. CV/AACC Milestone C shifted left from 1st quarter FY22 to 1st quarter FY21 and FRPDR was added 2nd quarter FY22 reflecting the current acquisition strategy. Aircraft Spotting Dolly (ASD) was moved to non-development program due to Commercial Off-The-Shelf (COTS) availability; removed contractor/government test and Milestone C from program schedule. Standard PEMA Cyber Solution (SPECS) POM 19 funded FY19 through FY21 with deliveries completing in FY22; program schedule added to budget.

Project 0852: The Third-Generation Electro-Optics (EO3) Technology Development project develops, integrates, and tests solutions to resolve EO3 obsolescence issues to enable sustained maintenance and repair capabilities for the F/A-18 ATFLIR and H-60 MTS weapons systems. The Test Technology

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0205633N *I Aviation Improvements*

Development project includes development of technical solutions to meet emerging weapons system testing requirements and to resolve other imminent Automated Test Equipment (ATE) obsolescence issues, including the Inertial Device Test Set (IDTS), the next-generation Electro-Optical (EO) subsystem, and other eCASS test system modernization requirements.

Project 2269: The Sustainment Lighting System (SLS) program experienced a six month slip to MS C caused by the delay in the Critical Design Review (CDR) due to design changes and system maturity concerns which delayed the delivery of required drawings and CDRLs required for CDR. Critical Design Review (CDR) moved from 2nd Quarter FY 2017 to 4th Quarter FY 2017. Test Readiness Review (TRR) moved from 3rd Quarter FY 2017 to 1st Quarter FY 2018. Developmental Test & Evaluation (DT&E) start moved from 3rd Quarter FY 2017 to 1st Quarter 2018. Operational Test Readiness Review (OTRR) moved from 4th Quarter FY 2018 to 2nd Quarter FY 2019. Milestone C moved from 2nd Quarter FY 2019 to 4th Quarter FY 2019. Production milestone for Full Rate Production Lot 1 and IOC moved from 4th Quarter FY 2019 to 2nd Quarter FY 2020.

Technical: Not Applicable.

NOTE: The 5K in FY22 of PU 2269 belongs in PU 1355.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0601 / *Acft Handling & Service Equip*	

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
0601: *Acft Handling & Service Equip*	31.486	2.619	2.722	4.868	-	4.868	6.778	3.093	2.748	4.804	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Common Ground Equipment is a Naval Aviation project to apply new technology to common support equipment necessary to support multiple systems/aircraft within the Navy. The common support equipment items developed with this budget are briefed to the Air Force, Army and Coast Guard for possible use in joint procurement in the production phase.

New programs are Turbo Shaft Engine Dynamometer Technology Development and Borescope Technology Development in FY18. Turbo Shaft Engine Dynamometer Technology Development involves efforts to develop a next generation ability to test the latest T700 engine's which will require higher torque levels than are currently available. Borescope Technology Development is to identify ways to increase availability and reliability of the current generation of borescopes that will become unsupportable as the manufacturer will stop support by FY22.

Funding supports the evaluation, testing and integration to develop Portable Electronic Maintenance Aids (PEMA) Commercial Off the Shelf solution for portable device deployments across the Naval Aviation Enterprise. PEMA is a portable device utilized by maintainers with the implementation of digital maintenance capabilities (digital publications, Interactive Electronic Technical Manuals, Internet Protocol based data uploads, Binary digit data downloads, automated diagnostics, and planeside Naval Aviation Logistics Command/Management Information System. PEMAs are a mandatory display device supporting modern day Automated Maintenance Environment implemented for weapon 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: Turbo Shaft Engine Dynamometer Technology Development	0.000	0.575	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop, integrate, and evolve dynamometer technologies and capabilities for insertion into testing of turbo shaft engines. Current V35 dynamometer used to test T700 engines at the intermediate maintenance level has obsolescence issues and worn components that have been overhauled three times since initial fielding in the 1980s. The OEM has stated that it does not recommend a fourth overhaul due to structural issues. Insertion of new dynamometer technologies is required to test next generation T700 engines with increased torque and horsepower and to retire legacy units which have tired metal due to cycle fatigue.					
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Perform market research of various dynamometer technologies needed to meet current and emergent T700 engine performance requirements. Evaluate dynamometer technology alternative solutions and perform analysis of alternatives to support development of an acquisition strategy for technology insertion and legacy dynamometer replacement. Develop requirements documents and procurement plan. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $-0.575M from FY2018 to FY2019 due to change in acquisition strategy.					
Title: Borescope Technology Development	0.000	0.483	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop, integrate, and evolve borescope technologies to meet emergent jet engine inspection requirements. Current fielded engine borescopes are unable to measure required defects on aircraft turbine engine compressor blades to the accuracy required. Additionally, current legacy borescopes will not be supported by the original equipment manufacturer beyond FY22. Legacy borescopes are susceptible to damage due to the insertion tube not being detachable/removable. A detachable insertion tube would increase system availability and reduce repair costs. New borescope technology is needed to improve defect measurement accuracy and equipment supportability. ***FY 2018 Plans:*** Perform market research of various borescope technologies needed to meet current and emergent engine inspection requirements. Evaluate borescope technology alternative solutions and perform analysis of alternatives to support development of an acquisition strategy for technology insertion and legacy borescope replacement. Develop requirements documents and procurement plan. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

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 $-0.483M from FY2018 to FY2019 due to non-availability of funds to complete analysis and market research to determine acquisition strategy.					
Title: Aircraft Spotting Dolly (ASD) ***Articles:*** ***Description:*** There are no commercially available towing vehicles that could even be modified to replace the capabilities of the present SD-2. An R & D effort will be required to design its replacement. Advances in batteries and alternating current motor drive systems in the past decade have made it feasible to design an electrically powered vehicle for the CV, CVN, and L-Class hanger deck spotting missions. Such a vehicle will be inherently more reliable, reduce maintenance, and eliminate the fumes and noise generated by a diesel engine. An electrically driven vehicle will provide much greater motion control for slow speeds to aid in the engagement to the aircraft nose gear. Proximity sensors will be incorporated to automatically stop the spotting dolly prior to accidental impact with the aircraft, other support equipment or bulkheads, increasing the safety of the spotting operations. The legacy ASD is close to thirty years old and experiencing parts obsolescence issues and general efficiency degradation. ***FY 2018 Plans:*** Moved to non-development program due to Commercial Off The Shelf (COTS) availability. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A	0.261 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Standard PEMA Cyber Solution (SPECS) ***Articles:*** ***Description:*** Capability/Program Description: The Portable Electronic Maintenance Aid (PEMA) Cyber Risk Assessment (CRA) has identified cyber vulnerabilities that could be exploited to threaten US fighting forces. Implementation of mandatory Cyber Security (CS) requirements would decrease the CS attack surface. Develop Standard PEMA Cyber Solution (SPECS) architecture for all PEMAs to standardize software across NAE, leverage existing enterprise tools, and to correct cyber shortfalls identified by the Cyber Warfare Detachment (CWD) Cyber Risk Assessment (CRA). Implement CS enhancements to reduce risk from cyber-attack. ***FY 2018 Plans:***	0.000 -	0.000 -	1.974 -	0.000 -	1.974 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

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:*** Develop Standard PEMA Cyber Solution (SPECS) core software solution enhancements to correct cyber shortfalls, develop/enhance Enterprise products (CMDS, PREP, and CFE) for software standardization across NAE, and develop/integrate T/M/S unique applications to be hosted on a common image. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $1.974M from FY2018 to FY2019 is due to the funding of POM 19 Issue # 50149 FRCFT Initiative 7 - Standard PEMA Cyber Solution (SPECS).					
Title: Carrier/Amphibious Assault Ship Crash Crane (CV/AACC)	1.663	0.964	2.194	0.000	2.194
Articles:	-	-	-	-	-
Description: Name change from Carrier Crash Crane (CV) to Carrier/Amphibious Assault Ship Crash Crane (CV/AACC) due to adding the amphibious assault ship back to the procurement. CV are required to remove damaged aircraft from the flight deck. In 2004, a solicitation for a commerical off the shelf replacement for the existing shipboard crash crane was issued. Two bids were received, and after a complete evaluation with many rounds of discussions with the companies bidding, both proposals were found to be technically inadequate and the procurement effort was discontinued. As a result, the crash cranes have continued operation unchanged. Designed in the late 1980's, major systems are beginning to experience the obsolescence of spare parts and are in need of updating. R&D resources are needed to identify not only replacements, but new technologies, which can increase the reliability and maintainability of this flight ops critical piece of equipment. Systems updates would include the engine/generator and electrical updates to the motor drive/control system. An exploration of power sources other than diesel engines would be considered and a corrosion resistant boom. ***FY 2018 Plans:*** Prepare contract spec, RFP, SOW and prepare for source selection. ***FY 2019 Base Plans:*** Conduct Milestone B and award 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 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

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 $1.23M from FY2018 to FY2019 due to Milestone B/Hardware Development Contract.					
Title: Portable Electronic Maintenance Aid (PEMA)	0.695	0.700	0.700	0.000	0.700
Articles:	-	-	-	-	-
Description: Portable Electronic Maintenance Aid (PEMA) funding supports the evaluation, testing and integration to develop PEMA Commercial Off-the-Shelf (COTS) solution for portable device deployments across the Naval Aviation Enterprise. PEMA is a portable device utilized by maintainers with the implementation of digital maintenance capabilities (digital publications, Interactive Electronic Technical Manuals, Internet Protocol based data uploads, Binary digit data downloads, automated diagnostics, and planeside Naval Aviation Logistic Command Management Information System. PEMAs are a mandatory display device supporting modern day Automated Maintenance Environment implemented for weapon systems. ***FY 2018 Plans:*** Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the GIG prior to deployment to the fleet by a yearly release cycle. ***FY 2019 Base Plans:*** Evaluate, test and integrate evolving COTS solutions. Conduct test & evaluation of T/M/S peculiar software/ hardware requirements and network connectivity compliance across the GIG prior to deployment to the fleet by a yearly release cycle. ***FY 2019 OCO Plans:*** N/A					
Accomplishments/Planned Programs Subtotals	2.619	2.722	4.868	0.000	4.868

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/0705: *Ground Support Equipment - CSE/ICP*	83.215	84.915	109.892	-	109.892	94.764	92.124	93.745	92.036	Continuing	Continuing
• OPN/4268: *Aviation Support Equipment - PEMA*	6.651	12.909	11.885	-	11.885	10.988	13.313	12.646	12.909	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

D. Acquisition Strategy

Common Ground Equipment: This is a non ACAT program. Field activities propose tentative projects. Internal panel merits and selects projects. Field activities develop projects and submit results. Operational Advisory Group process selects projects to transition to procurement.

Portable Electronic Maintenance Aids: The management approach includes the Program Management Office residing at NAVAIR with Milestone Decision Authority delegated to the Naval Air Systems Command Chief Information Officer. 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.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0601 / *Acft Handling & Service Equip*	

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 - CV	C/FFP	TBD : TBD	0.000	0.000		0.000		1.380	Jan 2019	-		1.380	0.000	1.380	1.380
Systems Engineering - ASD	WR	NAWCAD : LAKEHURST, NJ	0.961	0.161	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - CV	WR	NAWCAD : LAKEHURST, NJ	1.501	1.663	Nov 2016	0.964	Nov 2017	0.814	Nov 2018	-		0.814	Continuing	Continuing	Continuing
Systems Engineering - Dynamometer	WR	NAWCAD : LAKEHURST, NJ	0.000	0.000		0.575	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - Borescope	WR	NAWCAD : LAKEHURST	0.000	0.000		0.483	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering - SPECS	C/IDIQ	TBD : TBD	0.000	0.000		0.000		1.383	Dec 2018	-		1.383	0.000	1.383	1.383
Prior year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	17.517	0.000		0.000		0.000		-		0.000	0.000	17.517	-
		Subtotal	19.979	1.824		2.022		3.577		-		3.577	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 year Support cost no longer funded in the FYDP	Various	Various : Various	8.857	0.000		0.000		0.000		-		0.000	0.000	8.857	-
		Subtotal	8.857	0.000		0.000		0.000		-		0.000	0.000	8.857	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 T & E - PEMA	WR	NAWCAD : PAX RIVER, MD	0.963	0.170	Nov 2016	0.425	Nov 2017	0.425	Nov 2018	-		0.425	Continuing	Continuing	Continuing
Operational T & E - PEMA	WR	FRC SE : Jacksonville, FL	0.551	0.525	Nov 2016	0.275	Nov 2017	0.275	Nov 2018	-		0.275	0.000	1.626	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0601 / *Acft Handling & Service Equip*	

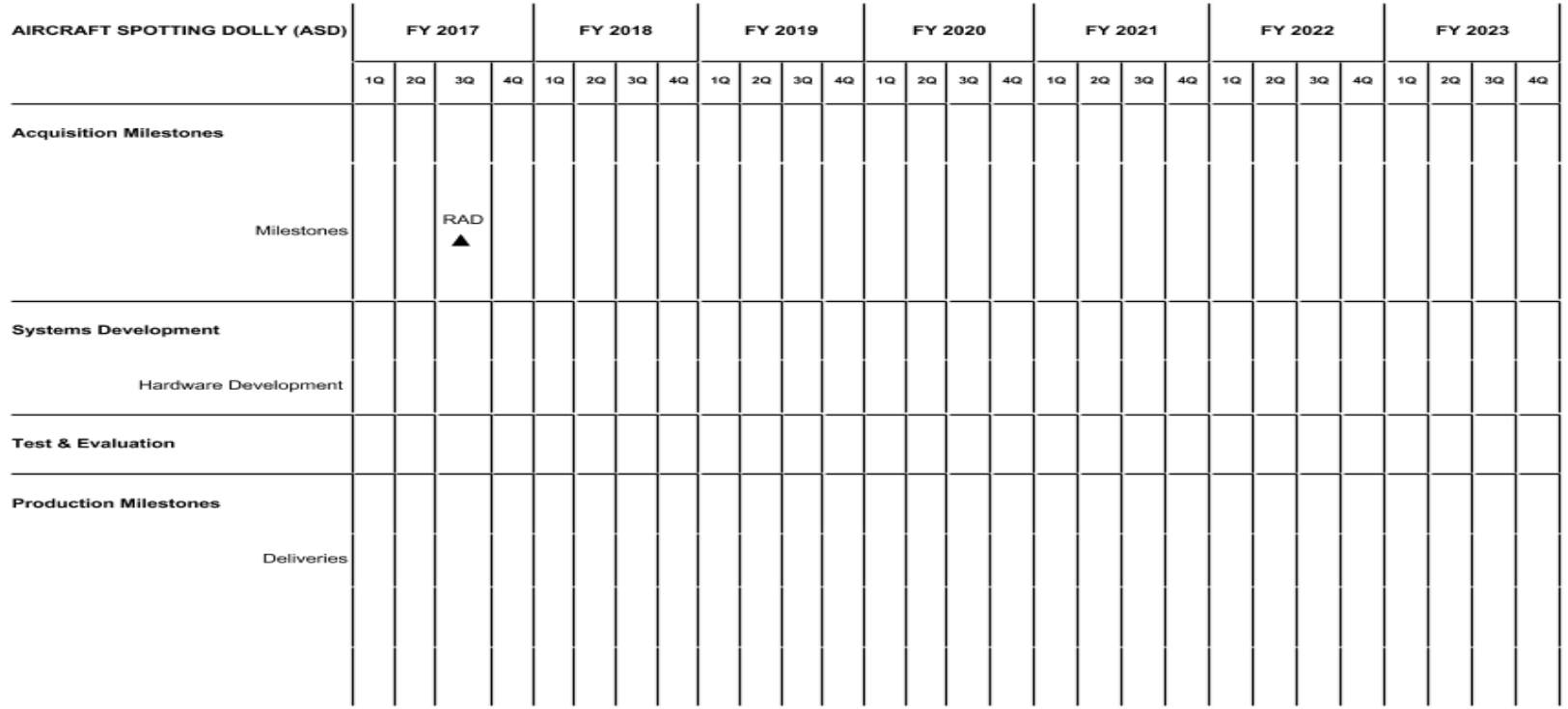
Test and Evaluation ($ in Millions)

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
C&G Test - ASD	WR	NAWCAD : PAX RIVER, MD	0.319	0.100	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
C&G Test - CV	WR	NAWCAD : PAX RIVER, MD	0.317	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Operational T & E - SPECS	WR	FRC SE : Jacksonville, FL	0.000	0.000		0.000		0.591	Dec 2018	-		0.591	0.000	0.591	-
Prior year T&E cost no longer funded in the FYDP	Various	Various : Various	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
		Subtotal	2.650	0.795		0.700		1.291		-		1.291	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	31.486	2.619		2.722		4.868		-		4.868	Continuing	Continuing	N/A

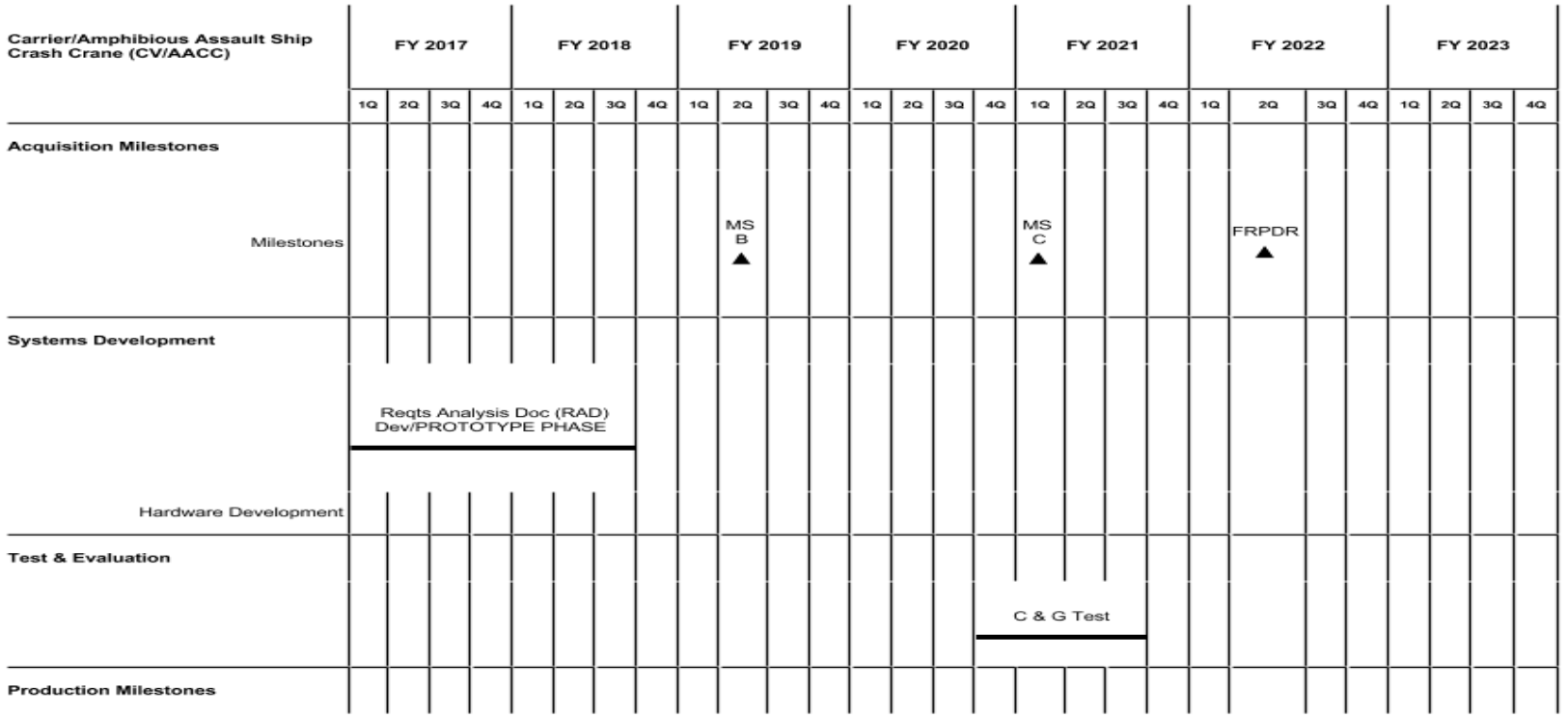
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*



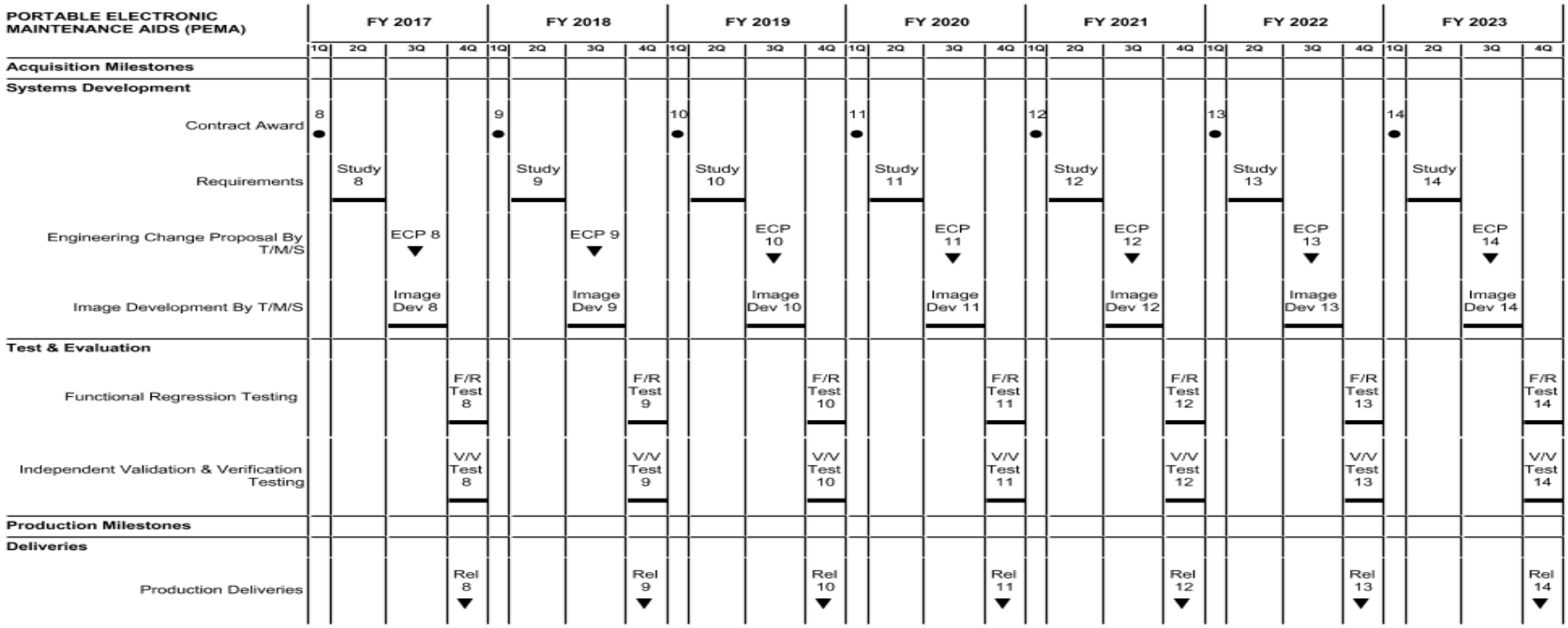
2019DON - 0205633N - 0601

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*



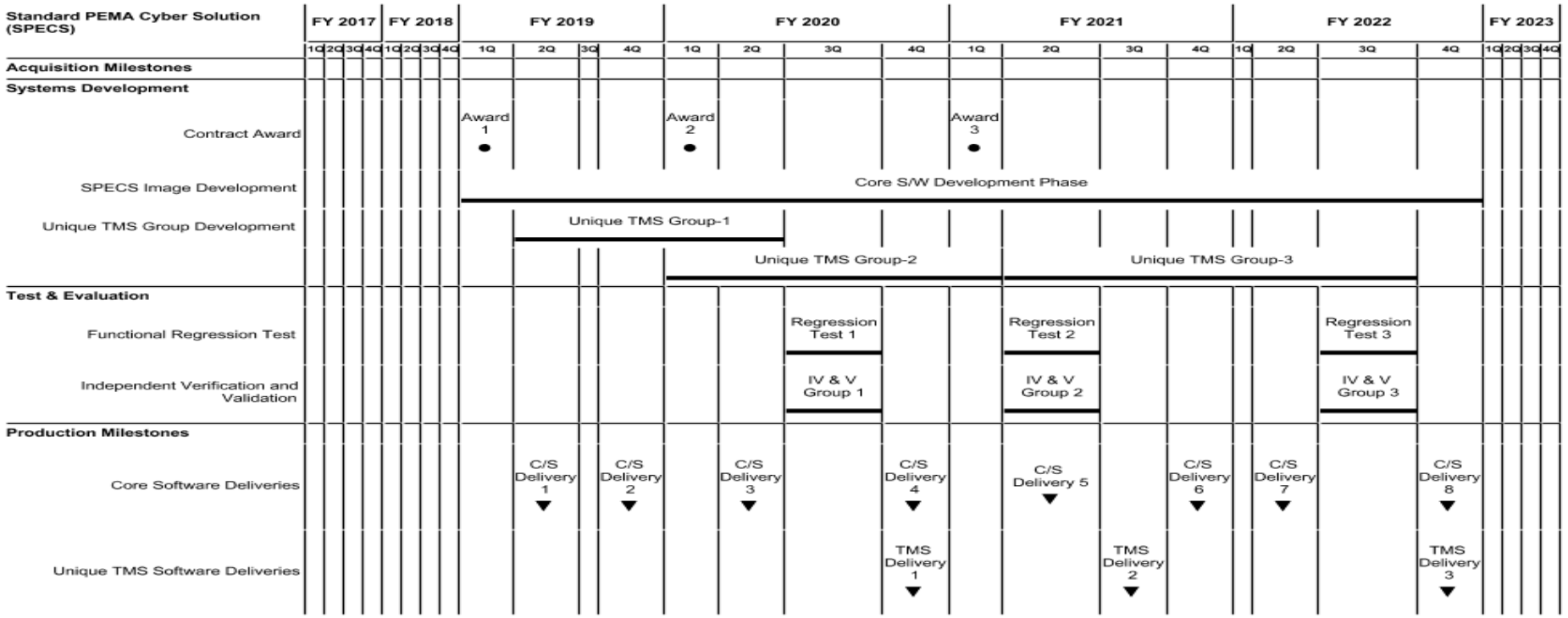
2019DON - 0205633N - 0601

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*



2019DON - 0205633N - 0601

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*



2019DON - 0205633N - 0601

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AIRCRAFT SPOTTING DOLLY (ASD)				
Acquisition Milestones: Milestones: ASD-Reqts Analysis Doc (RAD)	3	2017	3	2017
Carrier/Amphibious Assault Ship Crash Crane (CV/AACC)				
Acquisition Milestones: Milestones: MILESTONE B	2	2019	2	2019
Acquisition Milestones: Milestones: MILESTONE C	1	2021	1	2021
Acquisition Milestones: Milestones: FRPDR	2	2022	2	2022
Systems Development: Hardware Development	1	2017	3	2018
Test & Evaluation: CV - CONTRACTOR AND GOVT RUN TESTING	4	2020	3	2021
PORTABLE ELECTRONIC MAINTENANCE AIDS (PEMA)				
Systems Development: Contract Award: Contract Award 8	1	2017	1	2017
Systems Development: Contract Award: Contract Award 9	1	2018	1	2018
Systems Development: Contract Award: Contract Award 10	1	2019	1	2019
Systems Development: Contract Award: Contract Award 11	1	2020	1	2020
Systems Development: Contract Award: Contract Award 12	1	2021	1	2021
Systems Development: Contract Award: Contract Award 13	1	2022	1	2022
Systems Development: Contract Award: Contract Award 14	1	2023	1	2023
Systems Development: Requirements: Requirements Study Complete 8	2	2017	2	2017
Systems Development: Requirements: Requirements Study Complete 9	2	2018	2	2018
Systems Development: Requirements: Requirements Study Complete 10	2	2019	2	2019
Systems Development: Requirements: Requirements Study Complete 11	2	2020	2	2020
Systems Development: Requirements: Requirements Study Complete 12	2	2021	2	2021
Systems Development: Requirements: Requirements Study Complete 13	2	2022	2	2022
Systems Development: Requirements: Requirements Study Complete 14	2	2023	2	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 8	3	2017	3	2017
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 9	3	2018	3	2018
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 10	3	2019	3	2019
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 11	3	2020	3	2020
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 12	3	2021	3	2021
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 13	3	2022	3	2022
Systems Development: Engineering Change Proposal By T/M/S: Engineering Change Proposal By T/M/S, ECP 14	3	2023	3	2023
Systems Development: Image Development By T/M/S: Image Development By T/M/S 8	3	2017	3	2017
Systems Development: Image Development By T/M/S: Image Development By T/M/S 9	3	2018	3	2018
Systems Development: Image Development By T/M/S: Image Development By T/M/S 10	3	2019	3	2019
Systems Development: Image Development By T/M/S: Image Development By T/M/S 11	3	2020	3	2020
Systems Development: Image Development By T/M/S: Image Development By T/M/S 12	3	2021	3	2021
Systems Development: Image Development By T/M/S: Image Development By T/M/S 13	3	2022	3	2022
Systems Development: Image Development By T/M/S: Image Development By T/M/S 14	3	2023	3	2023
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 8	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 9	4	2018	4	2018
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 10	4	2019	4	2019
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 11	4	2020	4	2020
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 12	4	2021	4	2021
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 13	4	2022	4	2022
Test & Evaluation: Functional Regression Testing: Functional/Regression Testing 14	4	2023	4	2023
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 8	4	2017	4	2017
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 9	4	2018	4	2018
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 10	4	2019	4	2019
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 11	4	2020	4	2020
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 12	4	2021	4	2021
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 13	4	2022	4	2022
Test & Evaluation: Independent Validation & Verification Testing: Independent Validation & Verification Testing 14	4	2023	4	2023
Deliveries: Production Deliveries: Production Delivery, Release 8	4	2017	4	2017
Deliveries: Production Deliveries: Production Delivery, Release 9	4	2018	4	2018
Deliveries: Production Deliveries: Production Delivery, Release 10	4	2019	4	2019
Deliveries: Production Deliveries: Production Delivery, Release 11	4	2020	4	2020
Deliveries: Production Deliveries: Production Delivery, Release 12	4	2021	4	2021
Deliveries: Production Deliveries: Production Delivery, Release 13	4	2022	4	2022
Deliveries: Production Deliveries: Production Delivery, Release 14	4	2023	4	2023
Standard PEMA Cyber Solution (SPECS)				

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0601 / *Acft Handling & Service Equip*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Contract Award: Contract Award 1	1	2019	1	2019
Systems Development: Contract Award: Contract Award 2	1	2020	1	2020
Systems Development: Contract Award: Contract Award 3	1	2021	1	2021
Systems Development: SPECS Image Development: SPECS Image	1	2019	4	2022
Systems Development: Unique TMS Group Development: Unique TMS Group-1	2	2019	2	2020
Systems Development: Unique TMS Group Development: Unique TMS Group-2	1	2020	1	2021
Systems Development: Unique TMS Group Development: Unique TMS Group-3	2	2021	3	2022
Test & Evaluation: Functional Regression Test: Group 1	3	2020	3	2020
Test & Evaluation: Functional Regression Test: Group 2	2	2021	2	2021
Test & Evaluation: Functional Regression Test: Group 3	3	2022	3	2022
Test & Evaluation: Independent Verification and Validation: Group 1	3	2020	3	2020
Test & Evaluation: Independent Verification and Validation: Group 2	2	2021	2	2021
Test & Evaluation: Independent Verification and Validation: Group 3	3	2022	3	2022
Production Milestones: Core Software Deliveries: Deliveries 1	2	2019	2	2019
Production Milestones: Core Software Deliveries: Deliveries 2	4	2019	4	2019
Production Milestones: Core Software Deliveries: Deliveries 3	2	2020	2	2020
Production Milestones: Core Software Deliveries: Deliveries 4	4	2020	4	2020
Production Milestones: Core Software Deliveries: Deliveries 5	2	2021	2	2021
Production Milestones: Core Software Deliveries: Deliveries 6	4	2021	4	2021
Production Milestones: Core Software Deliveries: Deliveries 7	2	2022	2	2022
Production Milestones: Core Software Deliveries: Deliveries 8	4	2022	4	2022
Production Milestones: Unique TMS Software Deliveries: Deliveries 1	4	2020	4	2020
Production Milestones: Unique TMS Software Deliveries: Deliveries 2	3	2021	3	2021
Production Milestones: Unique TMS Software Deliveries: Deliveries 3	4	2022	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0852 / *Consolidated Auto 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
0852: *Consolidated Auto Support System*	161.389	6.308	6.661	6.734	-	6.734	6.539	6.638	6.762	6.915	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The electronic Consolidated Automated Support System (eCASS) project is the system design and development of the latest generation of the US Navy's CASS family of automatic test systems. The legacy CASS system was designed and developed in the 1980's and commenced fielding in 1992. As such, it is reaching the end of its useful life due to obsolescence issues. eCASS is the replacement system for legacy CASS systems, which provides Naval aircraft avionics component maintenance and repair support at Intermediate and Depot maintenance facilities both shore-based and afloat. As a CASS replacement program, the eCASS program objectives remain the same as that of CASS. Specifically: (1) increase material readiness; (2) reduce life cycle costs; (3) improve tester sustainability at depot and intermediate maintenance levels; (4) reduce proliferation of unique test equipment, and (5) provide test capability for existing and emerging avionics/electronics aircraft weapon systems.

The Test Technology Development project includes analysis, application, maturation, integration and testing of emerging electronic, mechanical and optical test technologies for potential military utility in support of Naval avionics testing and repair. Specifically included are next generation electro-optics, synthetic instruments, high-speed bus and inertial device technologies, and various other modernization elements for the CASS family of automatic test systems.

The Third Generation Electro-Optical (EO3) Technology Development project consists of the design and development of technology solutions, including a near-infrared camera solution to replace the existing obsolete EO3 console camera, for use in 65 fielded Navy test systems at both shore-based and afloat sites. The EO3 console subsystem is hosted by the US Navy Consolidated Automated Support System (CASS/eCASS) family of automatic test systems and is used to test, diagnose and repair the H-60 Multi-spectral Targeting System (MTS) and F/A-18 Advanced Targeting Forward Looking Infrared (ATFLIR) weapon systems. The objective of the EO3 Technology Development project is to extend the useful life of fielded EO3 systems in order to sustain H-60 MTS and F/A-18 ATFLIR weapon system readiness until a next-generation EO replacement system can be designed, developed, produced, 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: eCASS Development	3.523	0.316	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Develop, integrate and test an Automatic Test System (ATS) to replace legacy CASS systems. The new ATS will be compatible with and capable of hosting the hundreds of existing Test Programs that are currently utilized on legacy CASS at the Intermediate and Depot levels of maintenance, as well as any emerging Test Programs that may require greater test capability than provided by legacy CASS.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support 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: Close-out activities of System Development & Demonstration Contract ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.316M from FY2018 to FY2019 is due to completion of developmental tasks for the program.					
Title: Test Technology Development	2.785	2.382	2.380	0.000	2.380
Articles:	-	-	-	-	-
Description: Develops, integrates, and evolves enhanced test capabilities and technologies for insertion into the Consolidated Automated Support System (CASS) family of test systems. As weapon system electronics evolve, new test capabilities are required to support advanced systems. Existing test capabilities must be extended in range, accuracy, time and frequency domains in order to sustain the required test accuracy ratios for weapon systems support (the automatic test system must be four times as accurate as the asset being tested). ***FY 2018 Plans:*** Develop, integrate, and evolve enhanced test capabilities and technologies for insertion into the CASS family of test systems with an increased focus on development of advanced electro-optics and inertial device capabilities. Analyze weapons system performance requirements against available technologies, prepare and refine System Performance Specifications for inclusion within Requests for Proposals to enable contracting for development of advanced systems to support emerging weapons system requirements. ***FY 2019 Base Plans:*** Release requests for proposals and evaluate proposed solutions for next-generation electro-optics test system development and for inertial device and global positioning system test system development contracts. Continually evaluate emerging weapons system requirements to ensure the latest weapons system requirements are captured within the planned test system developmental contract award. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

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 $0.002M from FY2018 to FY2019 is rounding.					
Title: EO3 Technology Development	0.000	3.963	4.354	0.000	4.354
Articles:	-	2	-	-	-
Description: This project will develop, integrate and test technical solutions to resolve EO3 obsolescence issues, including a near infrared camera, that are capable of supporting the maintenance and repair of the F/A-18 ATFLIR and H-60 MTS weapon systems. ***FY 2018 Plans:*** Integrate two prototype near infrared camera assemblies into the EO3 system. Perform EO3 system design verification testing against the system specification requirements for compliance. Research and analyze solutions for other EO3 obsolescence resolution requirements. ***FY 2019 Base Plans:*** Test and evaluate interoperability of two prototype near infrared camera assemblies with the existing Test Program Sets and the eCASS EO3 system to verify compatibility. Perform an EO3 system technical evaluation to determine that the near IR camera solution is reliable and maintainable. Research and analyze solutions for other EO3 obsolescence issues in order to extend the EO3 service life until a modernized EO replacement system can be developed and fielded. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.391M from FY2018 to FY2019 is due to increase in development activities for Engineering Change Proposals (ECP) to resolve obsolescence issues.					
Accomplishments/Planned Programs Subtotals	6.308	6.661	6.734	0.000	6.734

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/0705: *Common Ground Equipment-CASS/ATE*	110.114	104.170	111.816	-	111.816	109.734	118.058	120.418	121.920	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

D. Acquisition Strategy

Formal test technology reviews with industry are conducted annually (cooperative Joint Services initiative) to define maturity of needed technologies. Further studies are conducted as needed. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0852 / *Consolidated Auto Support 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
Primary Hdw Dev - eCASS	C/CPIF	Lockheed Martin : Orlando, FL	101.263	2.329	Dec 2016	0.316	Dec 2017	0.000		-		0.000	0.000	103.908	103.908
Primary Hdw Dev - Test Technology	C/CPFF	Various : Various	1.711	2.069	Dec 2016	1.664	Dec 2017	1.643	Dec 2018	-		1.643	Continuing	Continuing	Continuing
Primary Hdw Dev - EO3	SS/CPFF	Northrop Grumman : Rolling Meadows, IL	0.000	0.000		3.417	Mar 2018	3.621	Dec 2018	-		3.621	0.690	7.728	7.728
Prior Year Prod Dev no longer funded in the FYDP	Various	Various : Various	28.397	0.000		0.000		0.000		-		0.000	0.000	28.397	-
		Subtotal	131.371	4.398		5.397		5.264		-		5.264	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
eCASS Support	WR	Various : Various	5.333	0.562	Dec 2016	0.000		0.000		-		0.000	0.000	5.895	-
eCASS Support	WR	NAWC AD : Lakehurst, NJ	8.407	0.548	Dec 2016	0.000		0.000		-		0.000	0.000	8.955	-
Test Technology Support	WR	NAWC AD : Lakehurst, NJ	0.600	0.660	Dec 2016	0.674	Dec 2017	0.689	Dec 2018	-		0.689	Continuing	Continuing	Continuing
EO3 Support	WR	NAWC AD : Lakehurst, NJ	0.000	0.000		0.497	Dec 2017	0.680	Dec 2018	-		0.680	0.198	1.375	-
Prior Year Support no longer funded in the FYDP	Various	Various : Various	12.853	0.000		0.000		0.000		-		0.000	0.000	12.853	-
		Subtotal	27.193	1.770		1.171		1.369		-		1.369	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
eCASS Travel	WR	Various : Various	0.906	0.084	Nov 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Test Tech Travel	WR	Various : Various	0.250	0.056	Nov 2016	0.044	Nov 2017	0.048	Nov 2018	-		0.048	Continuing	Continuing	Continuing
EO3 Travel	WR	Various : Various	0.000	0.000		0.049	Nov 2017	0.053	Nov 2018	-		0.053	0.021	0.123	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 0852 / *Consolidated Auto Support System*	

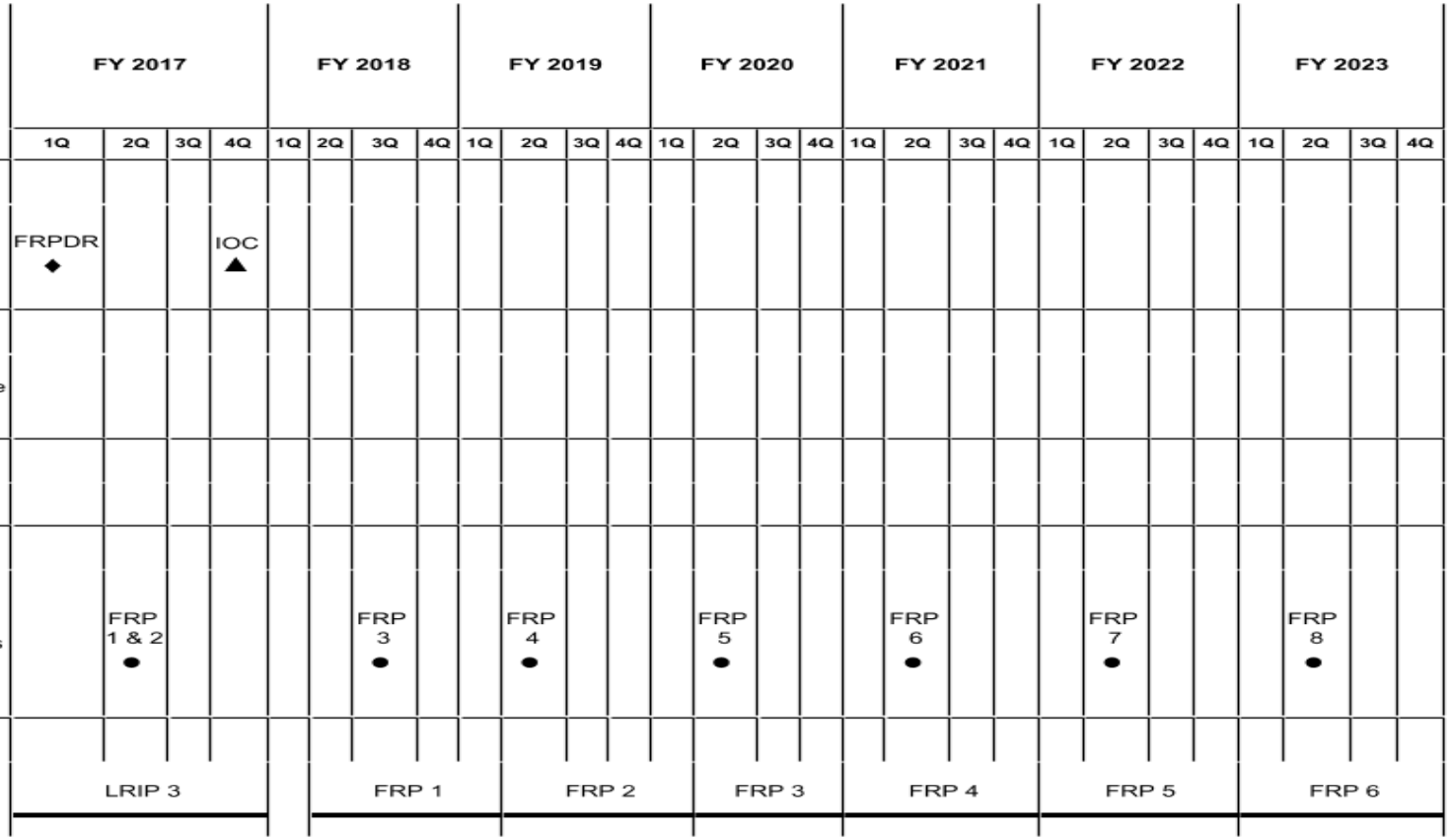
Management Services ($ in Millions)

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
Prior Year Mgmt no longer funded in the FYDP	Various	Various : Various	1.669	0.000		0.000		0.000		-		0.000	0.000	1.669	-
		Subtotal	2.825	0.140		0.093		0.101		-		0.101	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	161.389	6.308		6.661		6.734		-		6.734	Continuing	Continuing	N/A

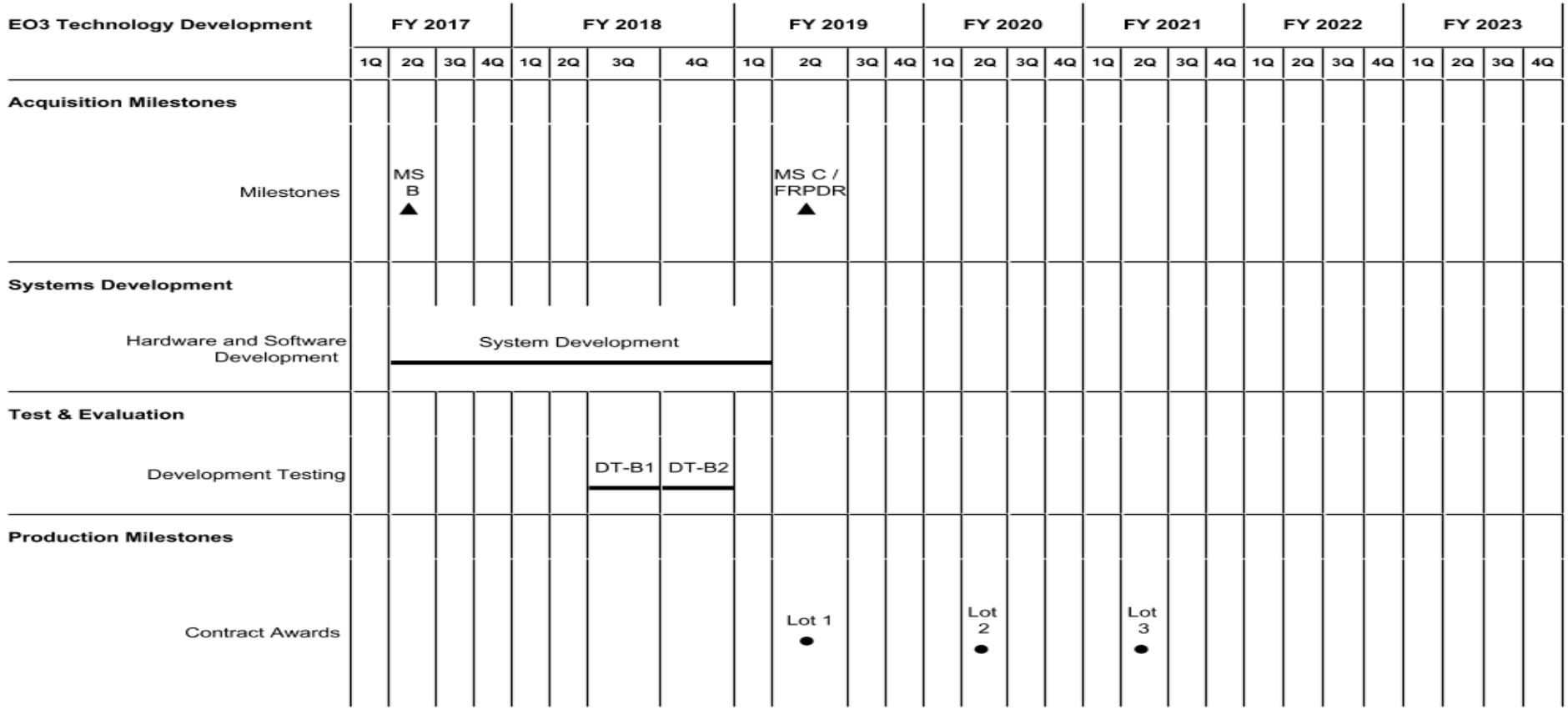
Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*



2019DON - 0205633N - 0852

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*



2019DON - 0205633N - 0852

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
electronic Consolidated Automated Support System (eCASS)				
Acquisition Milestones: Milestones: Full Rate Production Decision Review	1	2017	1	2017
Acquisition Milestones: Milestones: Initial Operating Capability	4	2017	4	2017
Production Milestones: Contract Awards: eCASS FRP 1/2-APN	2	2017	2	2017
Production Milestones: Contract Awards: eCASS FRP 3-APN	3	2018	3	2018
Production Milestones: Contract Awards: eCASS FRP 4-APN	2	2019	2	2019
Production Milestones: Contract Awards: eCASS FRP 5-APN	2	2020	2	2020
Production Milestones: Contract Awards: eCASS FRP 6-APN	2	2021	2	2021
Production Milestones: Contract Awards: eCASS FRP 7-APN	2	2022	2	2022
Production Milestones: Contract Awards: eCASS FRP 8-APN	2	2023	2	2023
Deliveries: eCASS LRIP 3	1	2017	4	2017
Deliveries: eCASS FRP 1	2	2018	1	2019
Deliveries: eCASS FRP 2	2	2019	1	2020
Deliveries: eCASS FRP 3	2	2020	4	2020
Deliveries: eCASS FRP 4	1	2021	4	2021
Deliveries: eCASS FRP 5	1	2022	4	2022
Deliveries: eCASS FRP 6	1	2023	4	2023
EO3 Technology Development				
Acquisition Milestones: Milestones: Milestone B	2	2017	2	2017
Acquisition Milestones: Milestones: Milestone C / FRPDR	2	2019	2	2019
Systems Development: Hardware and Software Development: System Development	2	2017	1	2019
Test & Evaluation: Development Testing: Design Verification Testing: DT-B1	3	2018	3	2018
Test & Evaluation: Development Testing: Regression Testing: DT-B2	4	2018	4	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 0852 / *Consolidated Auto Support System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Contract Awards: Lot 1 - 33 Units-APN	2	2019	2	2019
Production Milestones: Contract Awards: Lot 2 - 32 Units-APN	2	2020	2	2020
Production Milestones: Contract Awards: Lot 3 - 26 Units-APN	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1041 / *Acft Equip Repl/Maint 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
1041: *Acft Equip Repl/Maint Prog*	49.999	8.223	3.356	3.369	-	3.369	3.433	3.517	3.583	3.654	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) is the only Navy program which provides Research, Development, Test & Evaluation engineering support specifically for in-service, out-of-production aircraft equipment. AERMIP increases readiness through reliability, maintainability, and safety improvements to existing systems and equipment installed in Naval aircraft. It also provides a transition vehicle to deploy Total Ownership Cost reduction initiatives through flight-test support and Fleet Test & Evaluation. It meets affordable readiness objectives by providing a cost-effective solution to obsolescence problems encountered when service lives are extended. AERMIP promotes commonality and standardization across aircraft platform lines and among the services through extension of application and use of non-developmental items. AERMIP also decreases life cycle costs through reduced operational and support costs. AERMIP facilitates the Operational, Safety and Improvement Program by applying proven low-risk solutions to current fleet problems. AERMIP also funds high-priority flight testing which is not associated with any acquisition or development program under the Flight Test General task.

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 and Wiring	0.564	0.379	0.416	0.000	0.416
Articles:	-	-	-	-	-
FY 2018 Plans: Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Address avionics related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation.					
FY 2019 Base Plans: Test and evaluate equipment for effectiveness of wiring diagnostics and prognostics. Address avionics related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Qualify additional material or pieces of equipment and the procedures or processes required for implementation.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*

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 0.037 provides additional investigation and testing to be performed for high value return on investment opportunities.					
Title: Air Vehicle	7.071	2.060	2.040	0.000	2.040
Articles:	-	-	-	-	-
FY 2018 Plans: Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Continue to test and qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of structural component repair.					
FY 2019 Base Plans: Based on advancement in technology, test and qualify new materials or equipment and the procedures/process required for their implementation to improve operational reliability, while containing cost growth. Continue to test and qualify improved corrosion preventative compounds. Address subsystem related reliability/maintainability issues impacting multiple aircraft platforms while continuing to investigate high value return on investment initiatives. Maintain efforts to qualify improved methods of structural component repair.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease due to Economic Assumptions which will reduce Organic labor.					
Title: Systems Engineering Revitalization	0.588	0.917	0.913	0.000	0.913
Articles:	-	-	-	-	-
FY 2018 Plans: Continue with improvements in the current SE process and transition to model-centric systems engineering methodology (SE transformation). This transformation evolution requires updates to process, methods, tools, and training. Associated products include evolving Systems Engineering Technical Review checklist to a model-centric design assessment framework and continuing the development and deployment of the web-based collaborative Systems Engineering toolset (Integrated System Engineering Environment).					
FY 2019 Base Plans: Continue the transition to model based system engineering methodology. Continue to develop and establish					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
infrastructure and tools for an Integrated Modeling Environment. Establish processes and procedures for developing and extending systems models. Develop standard model libraries and stereotypes for NAVAIR use. Continue research in relevant technical areas. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease due to process improvement adjustments which will reduce Contractor support.					
Accomplishments/Planned Programs Subtotals	8.223	3.356	3.369	0.000	3.369

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a non-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

The Aircraft Equipment Reliability/Maintainability Improvement Program (AERMIP) program will, at a minimum, fund 8 to 15 projects a year that investigate and evaluate reliability and maintainability improvements to in-service, out-of-production aircraft equipment. AERMIP projects will have a greater than 75% success rate of insertion into Department of the Navy warfighting systems or support infrastructure.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1041 / *Acft Equip Repl/Maint 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
Sys Eng - Avionics/Wiring	WR	NAWCAD : Patuxent River, MD	6.122	2.952	Oct 2016	0.184	Oct 2017	0.276	Oct 2018	-		0.276	Continuing	Continuing	Continuing
Sys Eng - Avionics/Wiring	C/FFP	Various : Various	0.555	2.200	Aug 2018	0.055	Jan 2018	0.060	Jan 2019	-		0.060	0.000	2.870	0.670
Sys Eng - Avionics/Wiring	WR	FRC-E : Cherry Point, NC	0.100	0.010	Nov 2016	0.050	Nov 2017	0.010	Nov 2018	-		0.010	Continuing	Continuing	Continuing
Sys Eng - Avionics/Wiring	WR	FRC-SE : Jacksonville, FL	0.000	0.010	Nov 2016	0.025	Nov 2017	0.010	Nov 2018	-		0.010	Continuing	Continuing	Continuing
Sys Eng - Avionics/Wiring	WR	FRC-SW : San Diego, CA	0.000	0.010	Nov 2016	0.025	Nov 2017	0.010	Nov 2018	-		0.010	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	WR	NAWCAD : Patuxent River, MD	10.765	0.992	Oct 2016	0.269	Oct 2017	0.245	Nov 2018	-		0.245	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	WR	FRC-SW : San Diego, CA	2.124	0.257	Nov 2016	0.025	Nov 2017	0.175	Nov 2018	-		0.175	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	WR	FRC-E : Cherry Point, NC	1.815	0.286	Nov 2016	0.025	Nov 2017	0.060	Nov 2018	-		0.060	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	WR	FRC-SE : Jacksonville, FL	1.148	0.068	Nov 2016	0.025	Nov 2017	0.020	Nov 2018	-		0.020	Continuing	Continuing	Continuing
Sys Eng - Air Vehicle	C/FFP	Various : Various	0.962	0.000		1.556	Jan 2018	1.390	Jan 2019	-		1.390	0.000	3.908	3.908
Sys Eng - Air Vehicle	C/CPFF	Innovative Technology, Inc. : Santa Barbara, CA	0.100	0.000		0.000		0.000		-		0.000	0.000	0.100	0.100
Sys Eng - SE Revitalization	WR	NAWCAD : Patuxent River, MD	0.994	0.003	Oct 2016	0.117	Nov 2017	0.006	Dec 2018	-		0.006	Continuing	Continuing	Continuing
Sys Eng - SE Revitalization	C/FFP	Engility Corp. : Chantilly, VA	4.519	0.508	Jan 2017	0.550	Jan 2018	0.232	May 2019	-		0.232	0.000	5.809	5.809
Sys Eng - SE Revitalization	C/CPFF	Stevens Inst of Technology : Hoboken, NJ	1.543	0.727	Jan 2017	0.250	Dec 2017	0.675	Jan 2019	-		0.675	0.000	3.195	3.195
Prior Year Sys Eng NAE/ Prod Dev no longer funded in the FYDP	Various	Various : Various	2.713	0.000		0.000		0.000		-		0.000	0.000	2.713	-
		Subtotal	33.460	8.023		3.156		3.169		-		3.169	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1041 / *Acft Equip Repl/Maint Prog*

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 Year Support cost no longer funded in the FYDP	Various	Various : Various	12.480	0.000		0.000		0.000		-		0.000	0.000	12.480	-
		Subtotal	12.480	0.000		0.000		0.000		-		0.000	0.000	12.480	N/A

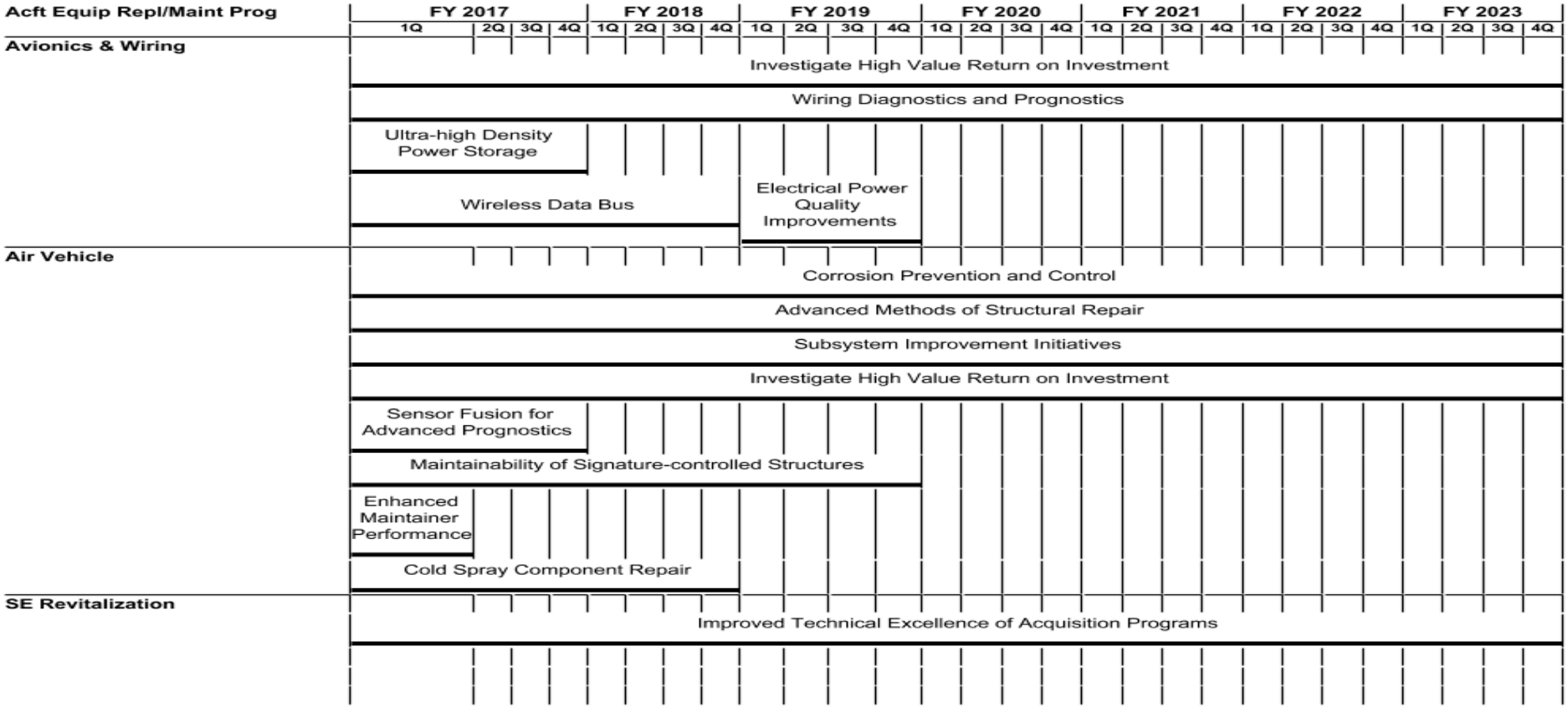
Management Services ($ in Millions)

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	NAWCAD : Patuxent River, MD	2.088	0.200	Oct 2016	0.200	Oct 2017	0.200	Oct 2018	-		0.200	Continuing	Continuing	Continuing
Prior Year Mgmt cost no longer funded in the FYDP	Various	Various : Various	1.971	0.000		0.000		0.000		-		0.000	0.000	1.971	-
		Subtotal	4.059	0.200		0.200		0.200		-		0.200	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	49.999	8.223		3.356		3.369		-		3.369	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*



2019DON - 0205633N - 1041

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1041 / *Acft Equip Repl/Maint Prog*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft Equip Repl/Maint Prog				
Avionics & Wiring: Investigate High Value Return on Avionics & Wiring Investment	1	2017	4	2023
Avionics & Wiring: Wiring Diagnostics and Prognostics	1	2017	4	2023
Avionics & Wiring: Ultra-high Density Power Storage	1	2017	4	2017
Avionics & Wiring: Wireless Data Bus	1	2017	4	2018
Avionics & Wiring: Electrical Power Quality Improvements	1	2019	4	2019
Air Vehicle: Corrosion Prevention and Control	1	2017	4	2023
Air Vehicle: Advanced Methods of Structural Repair	1	2017	4	2023
Air Vehicle: Subsystem Improvement Initiatives	1	2017	4	2023
Air Vehicle: Investigate High Value Return on Air Vehicle Investment	1	2017	4	2023
Air Vehicle: Sensor Fusion for Advanced Prognostics	1	2017	4	2017
Air Vehicle: Maintainability of Signature-controlled Structures	1	2017	4	2019
Air Vehicle: Enhanced Maintainer Performance	1	2017	1	2017
Air Vehicle: Cold Spray Component Repair	1	2017	4	2018
SE Revitalization: Improved Technical Excellence of Acquisition Programs	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component 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
1355: *Propulsion and Power Component Improvement Program*	1,054.223	89.303	94.001	105.223	-	105.223	108.500	107.164	107.355	108.984	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Propulsion and Power (P&P) Component Improvement Program (CIP) provides the only source of critical design and development engineering support to resolve safety, reliability and maintainability deficiencies of in-service Navy and Marine Corps aircraft propulsion systems. The highest priority issues P&P CIP addresses concern safety-of-flight deficiencies, which account for approximately 80% of P&P CIP efforts. The program also corrects service-revealed deficiencies, improves Operational Readiness and Reliability and Maintainability, and reduces platform Life Cycle Cost. Budgets are allocated across platform-specific teams and multi-platform product support teams based upon long term strategies to achieve safety and affordable readiness goals; the R-3 exhibit details annual portions of those long-term strategies. P&P CIP tasks have reduced the rate of in-flight aborts, safety incidents, non-mission capable rates, scheduled and unscheduled engine removals, maintenance work hours, and overall cost of ownership. This is accomplished through the maintenance and validation of specification performance, testing to qualify engineering changes, verifying life limits, and improving the inherent reliability of the propulsion and power systems as an integral part of Reliability Centered Maintenance initiatives. Historically, the missions, tactics, and environmental exposure of military aircraft systems change to meet new threats or operational demands, and often result in unforeseen problems, which if not corrected, can cause critical safety/readiness degradation, such as those experienced during OPERATIONS DESERT SHIELD/DESERT STORM, ENDURING FREEDOM, and IRAQI FREEDOM due to sand erosion. In addition, new problems arise through actual fleet deployment and usage of the aircraft. System development programs, while geared to resolve as many problems as possible before deployment, cannot duplicate actual operations or account for the vast array of environmental and usage variables, particularly when aircraft missions vary from those that the aircraft was designed to perform. Therefore, it has been found that P&P CIP can provide an immediate engineering response to these flight-critical problems and accelerated engine testing can avoid potential problems. P&P CIP starts after development and Navy acceptance of the first production article and addresses usage and life problems not covered by warranties. P&P CIP addresses engines, transmissions, propellers, starters, auxiliary power units, electrical generating systems, aircraft wiring, and fuel and lubricant systems. These efforts continue over the system's life, gradually decreasing to a minimum level sufficient to maintain the reliability, and decrease the operating costs, of older inventory. P&P CIP is a highly leveraged and cooperative tri-service program with Foreign Military Sales participation.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: P3, E2, C2, C130 (T56)	8.671	11.000	10.300	0.000	10.300
Articles:	-	-	-	-	-
FY 2018 Plans: Complete bench testing and qualification testing on front turbine bearing cage, front turbine bearing support and combustor liner redesigns. Execute engine Accelerated Mission Test. Submit engineering change for combustor					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
liner redesign. Initiate development and design of updated software for the propulsion control and monitoring unit to correct identified deficiencies. ***FY 2019 Base Plans:*** Continue joint projects with the USAF on the T56 Series III engine on the analysis, design and qualification of improvements to the front turbine bearing cage, front turbine bearing support, front bearing chamber labyrinth seal, engine parts and propeller brake lining obsolescence and repair engineering development. Execute engine Accelerated Mission Test. For the T56 Series IV engine perform analysis, design and qualification work related to engine performance standardization, rub tolerant turbine blades, fuel nozzle anti-coke coating, step up gearbox oil leakage and updated software for the propulsion control and monitoring unit. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The -0.7 reduction is due to reduced T56 Series III engine design change activity for the P-3 fleet.					
Title: E2/C2/C130/P3 (Props)	2.398	1.500	3.600	0.000	3.600
Articles:	-	-	-	-	-
FY 2018 Plans: Complete design and submit engineering change for 54H60 propeller brake lining obsolescence redesign. Complete field service evaluation and submit engineering change for NP2000 variable pitch actuator transfer tube seal improvement redesign. ***FY 2019 Base Plans:*** Develop, design and test 54H60 and NP2000 Propeller system improvements including control, pitch actuation, hydraulics, blades, pumps, housings, seals and static structure projects to improve safety, reliability, maintainability, affordability, durability and Readiness including efforts on repair and reliability engineering, universal closed loop bench test system, database development and management. For the NP2000 perform analysis, design and testing on the modern pump housing and onboard propeller balance monitoring system. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The 2.1 increase will fund the increased 54H60 and NP2000 propeller system improvements design effort.					
Title: SH-60B/F, HH-60H, MH-60R/S (T700)	3.318	5.678	5.700	0.000	5.700
Articles:	-	-	-	-	-
FY 2018 Plans: Continue redesign work to reduce impact of cost and readiness drivers for the T700 engine. Conduct lithium battery qualification safety and performance testing. Complete test planning in preparation for an engine accelerated simulated mission endurance test and saltwater ingestion test to qualify Black Gold compressor coating.					
FY 2019 Base Plans: Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems. Perform analysis, design and testing on projects to improve the compression system and static structures tolerance to sand ingestion, engine performance modeling and engine build optimization. Perform analysis, modeling design and testing on projects related to air vehicle drive system damage tolerance and reparability. Conduct lithium battery qualification testing. Perform engine testing to develop and qualify design improvements.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The 0.022 increase is for the increased testing required for the T700 engine.					
Title: H-1 (T400/T700)	1.000	0.431	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Redesign the air vehicle tail rotor flexible coupling to a non-lubricated design to improve reliability. Update subsystem support planning based on evaluation of maintenance task improvements, service-revealed					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
deficiencies, and emergent issues from fleet operational usage on all propulsion and power subsystems, including engine, auxiliary power unit, fuel, electrical power, and wiring. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of -0.431 is due to reduced air vehicle drive system design change.					
Title: AV-8B (F402) ***Articles:*** ***FY 2018 Plans:*** Continue working on risk management plan of supplying critical parts and refinement of life limit determinations and identification of critical parts constraints. Continue efforts to identify alternate parts and vendors for consumable hardware. ***FY 2019 Base Plans:*** Continue working on risk management plan of supplying critical parts and refinement of life limit determinations and identification of critical parts constraints. Perform analysis, design and testing related to improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems, Hydro mechanical unit PMA gear, FOD detection system, brake seal redesign to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of -0.419 is due to reduced F402 engine design change.	3.560 -	3.849 -	3.430 -	0.000 -	3.430 -
Title: H-53/H-46/H-3 (T58/T64) ***Articles:*** ***FY 2018 Plans:***	3.275 -	4.530 -	3.800 -	0.000 -	3.800 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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 to develop inspection and repair criteria for fielded components and optimization of depot-level engine build practices and procedures to increase engine performance. Continue updates of engine mission usage and engine critical hardware life management plans. Evaluate engine fuel nozzle candidate anti-coking coatings to improve fuel nozzle durability. ***FY 2019 Base Plans:*** Perform analysis, design and testing related to projects to develop inspection and repair criteria and optimized depot-level engine build specification practices and procedures, data reduction program implementation, compressor case coating improvements and remote idle cable interface system. Update engine mission usage and hardware life management plans. Evaluate engine fuel nozzle anti-coking coatings. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of -0.73 is due to reduced H-53 (T64) engine design change.					
Title: F-18 C/D/E/F (F414/F404)	22.669	16.926	19.758	0.000	19.758
Articles:	-	-	-	-	-
FY 2018 Plans: Continue F404 engine electrical control assembly obsolescence redesign. Develop an improved engine vibration measurement system to increase measurement accuracy at fleet test cells. Continue evaluation and testing of alternate engine fan blade dovetail coatings to improve component durability. Perform rotor spin testing of engine fan hardware to verify the low cycle fatigue life benefit of the low plasticity burnishing surface treatment. Apply data analytics tools to engine reliability data sets to identify engine removal driver causes. Complete design efforts to extend the life of the F414 engine main fuel manifold. Continue redesign of the high-pressure turbine blades to reduce the frequency of unscheduled engine removals. Continue design of improved oil system components and architecture to reduce in-flight mission abort rates. Continue investigation of engine variable exhaust nozzle hydro-mechanical failure events. Continue analysis and evaluation of composite outer bypass duct delamination. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
Perform analysis, design and testing related to F404 electrical control assembly obsolescence recovery, improved engine vibration measurement system, and evaluation of fan blade dovetail coatings to improve durability. Perform rotor spin testing of engine fan to verify surface treatment life benefit. Perform analysis, design and testing related to application of data analytics tools to identify engine removal driver causes, F414 engine main fuel manifold life extension, high-pressure turbine blades redesign, oil system improvements, engine VEN hydro-mechanical failure events, composite outer bypass duct delamination, compressor discharge pressure anti-ice valve VEN position transmitter system, engine build optimization and FADEC obsolescence. Perform engine accelerated simulated mission endurance testing. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power, augmentor and exhaust systems to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of 2.832 is due to additional engine test activity for the F414 and F404.					
Title: T-45 (F405)	4.072	3.021	2.446	0.000	2.446
Articles:	-	-	-	-	-
FY 2018 Plans: Continue redesign work to reduce impact of cost and readiness drivers for the F405 engine based on service revealed deficiencies and address safety issues reported from fleet. Initiate component level rotor spin testing of the low pressure compressor to verify the ability of the improved blade dovetail coating system to mitigate blade cracking under high-cycle fatigue excitation conditions. Perform assessment of engine cyclic usage rates at the Kingsville and Meridian sites to update critical rotating engine part lives. Continue study to identify mitigation approaches to address propulsion and power system component obsolescence issues. ***FY 2019 Base Plans:*** Perform analysis, design and testing on projects to verify improved blade dovetail coating, engine cyclic usage assessment to update rotating engine part lives and mitigation approaches to address propulsion and power system component obsolescence issues and engine performance degradation. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of -0.575 is due to the reduced F405 engine design change activity.					
Title: V-22 Propulsion	2.787	4.236	5.200	0.000	5.200
Articles:	-	-	-	-	-
FY 2018 Plans: Prepare for full-scale engine testing to mitigate rapid power loss and engine surge events that have occurred during reduced visibility landing operations to increase flight safety. Complete update of engine critical part lives and engine life management plan based on updated mission mix usage requirements. Perform redesign to improve prop rotor input quill clutch system robustness to address known failure modes. Continue efforts to improve accuracy of the in-flight power assurance check to improve mission planning capability. ***FY 2019 Base Plans:*** Perform analysis, design and testing on projects to mitigate rapid power loss and engine surge, update engine part lives and management plan with updated mission mix, prop rotor input quill clutch system redesign and improved power assurance check accuracy to improve mission planning. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. Perform engine analytical condition inspections, air vehicle drive system damage tolerance assessment and turbine rig and full scale engine testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of 0.964 is due to increased engine and drive system design changes for the V-22 propulsion.					
Title: Adversary (J85) (F100)	1.453	2.660	2.200	0.000	2.200
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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: Continue contributing to the J85 and F100 common CIP with the USAF and Foreign Military Sales customers. Continue validation and life assessment of J85 life limited critical rotating hardware in the compressor including front and rear spools and turbine including stage 1 and stage 2 disks. Evaluate hardware inspection data, and perform stress modeling to update low cycle fatigue life limits. Implement an upgraded modification of the engine performance monitoring system for future mission analysis. Implement J85 improved turbine thermocouple probe and harness redesign to reduce engine performance related removals driven by harness failures. ***FY 2019 Base Plans:*** Continue joint projects with the USAF to perform analysis, design and testing on projects to validate the life assessment of J85 critical rotating compressor hardware, address parts obsolescence issues, evaluate hardware inspection data, and perform stress modeling to update life limits, implement upgraded engine performance monitoring system, and implement improved turbine thermocouple probe and harness redesign. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power, augmenter and exhaust systems to improve safety, reliability, maintainability, affordability, durability and Readiness. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of -0.46 is due to the completion of the engine design projects on the performance monitoring and thermocouple systems.					
Title: Joint Strike Fighter (F135 Engine)	28.479	32.861	33.526	0.000	33.526
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to work with Joint Program Office, USAF, international partners, and foreign military sales customers to prioritize and develop engineering project descriptions that resolve flight test and fleet service revealed deficiencies. In concert with the USAF, support joint service engine accelerated simulated mission endurance testing and LTF engine testing on the conventional takeoff and landing propulsion system. Prepare for the short					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
takeoff/vertical landing (STOVL) accelerated simulated mission endurance testing with hardware improvements to demonstrate continued durability improvement. ***FY 2019 Base Plans:*** Continue to work with Joint Program Office, USAF, international partners, and foreign military sales customers to develop engineering project descriptions to resolve service revealed deficiencies. Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power, augmenter, exhaust and STOVL Lift system to improve safety, reliability, maintainability, affordability, durability and Readiness. Perform engine testing and STOVL propulsion system testing ant government and contractor test facilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of 0.665 is for the increased F135 engine and lift system design change.					
Title: P-8A (CFM56 Engine)	1.150	0.500	0.600	0.000	0.600
Articles:	-	-	-	-	-
FY 2018 Plans: Mature out-year program engine management planning and updates to operational and readiness metric baselines and mature subsystem support planning based on evaluation of leading indicators, age exploration results, maintenance task improvements, service-revealed deficiencies, and emergent issues from fleet operational usage on all propulsion and power subsystems, including engine, auxiliary power unit, fuel, electrical power, and wiring. ***FY 2019 Base Plans:*** Develop, design and test improvements to system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
Increase of 0.1 is for the increased propulsion system design activity.					
Title: H-53K Propulsion	0.000	0.000	7.700	0.000	7.700
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Develop, design and test improvements to Propulsion & Power system components including compressors, combustors, turbines, controls, diagnostics, static structures, gearboxes, bearings, seals, drives, fuels, lubricants, auxiliary power, electrical power systems to improve safety, reliability, maintainability, affordability, durability and Readiness. Acquire an engine test vehicle to qualify design changes developed under the component improvement program.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase of 7.7 is for the development, design and test improvements for the H-53K Propulsion & Power system components.					
Title: Multi-Platform Product Support Teams	6.471	6.809	6.963	0.000	6.963
Articles:	-	-	-	-	-
FY 2018 Plans: Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels, lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems. Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing.					
FY 2019 Base Plans: Continue projects to provide common support to multiple platforms in the areas of improved drive systems, secondary power, and mechanical systems; improve tools for performance analysis, modeling and simulation, diagnostics, engine reliability assessment, and structural integrity; improve products and processes for fuels,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
lubricants, and refueling equipment; and improve electrical system product support, wiring, and battery systems. Includes funding for Government Furnished Equipment fuel provided in support of engine developmental and qualification testing. Modernize RDTE test facilities as required to qualify component design improvements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of 0.154 is due to increased requirement for GFE fuel for engine development testing.					
Accomplishments/Planned Programs Subtotals	89.303	94.001	105.223	0.000	105.223

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

This is a NON-ACAT program. Procurement strategy is determined by market survey and cooperative opportunities.

E. Performance Metrics

The Propulsion and Power Component (P&P) Improvement Program (CIP) will support engineering design and development efforts for 100% of the safety of flight issues on in-service propulsion and power systems covered under the Program. Over the past two years, this equated to more than 360 individual Engineering Project Descriptions (EPDs). Over the past two years P&P CIP also addressed reliability and maintainability deficiencies equating to another 100 individual EPDs. These projects have significantly increased the aggregate engine safety and reliability across the USN/ USMC fleet. From 2006 to 2016 P&P CIP has been a primary contributor to a 60% Reduction in propulsion and power system related Class A mishaps, a 118% increase in aggregate fleet engine reliability as measured by engine Time-On Wing (TOW) and the resultant cumulative engine repair cost avoidance of $5.5 B over that time span.

Program execution will be actively managed on 100% of the projects via contractor earned value data and overall obligation and expenditure rates as reflected in Navy ERP. Data will be analyzed and measured against OSD/FMB benchmarks on a monthly basis.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
Sys Eng T56 Engine Program	WR	NAWCAD : Patuxent River, MD	38.467	4.500	Nov 2016	4.153	Nov 2017	4.100	Oct 2018	-		4.100	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	SS/CPFF	Rolls Royce : Indianapolis, IN	52.492	3.876	Jan 2017	5.973	Jan 2018	5.500	Jan 2019	-		5.500	0.000	67.841	67.841
Sys Eng T56 Engine Program	WR	FRC-E : Cherry Point, NC	2.390	0.235	Nov 2016	0.810	Nov 2017	0.500	Oct 2018	-		0.500	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	WR	FRC-SE : Jacksonville, FL	0.875	0.010	Nov 2016	0.011	Nov 2017	0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
Sys Eng T56 Engine Program	WR	FRC-SW : North Island, CA	0.075	0.050	Nov 2016	0.053	Nov 2017	0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
Sys Eng Props Program	SS/CPFF	Hamilton Sundstrand : Windsor Locks, CT	26.035	2.398	Jan 2017	1.500	Jan 2018	3.600	Jan 2019	-		3.600	0.000	33.533	33.533
Sys Eng J52 Engine Program	WR	NAWCAD : Patuxent River, MD	14.429	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Sys Eng J52 Engine Program	SS/CPFF	UTC Pratt & Whitney : East Hartford, CT	41.445	0.000		0.000		0.000		-		0.000	0.000	41.445	41.445
Sys Eng J52 Engine Program	WR	FRC-E : Cherry Point, NC	0.088	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Sys Eng J52 Engine Program	WR	FRC-SE : Jacksonville, FL	0.425	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Sys Eng T700 Engine Program	WR	NAWCAD : Patuxent River, MD	16.241	1.500	Nov 2016	2.186	Nov 2017	2.500	Oct 2018	-		2.500	Continuing	Continuing	Continuing
Sys Eng T700 Engine Program	SS/CPFF	General Electric : Lynn, MA	32.211	1.818	Jan 2017	3.492	Jan 2018	3.200	Jan 2019	-		3.200	0.000	40.721	40.721
Sys Eng T700 Engine Program	IA	Army Research Lab : Aberdeen Proving Ground, MD	0.150	0.000		0.000		0.000		-		0.000	0.000	0.150	-
Sys Eng T400 Engine Program	WR	NAWCAD : Patuxent River, MD	2.167	1.000	Nov 2016	0.431	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 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component 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
Sys Eng T400 Engine Program	SS/CPFF	UTC Pratt & Whitney : East Hartford, CT	5.890	0.000		0.000		0.000		-		0.000	0.000	5.890	5.890
Sys Eng F402 Engine Program	WR	NAWCAD : Patuxent River, MD	19.437	1.677	Nov 2016	1.693	Nov 2017	1.700	Oct 2018	-		1.700	Continuing	Continuing	Continuing
Sys Eng F402 Engine Program	WR	NAWCWD : China Lake, CA	0.303	0.000		0.000		0.000		-		0.000	0.000	0.303	-
Sys Eng F402 Engine Program	WR	FRC-E : Cherry Point, NC	0.897	0.105	Nov 2016	0.105	Nov 2017	0.130	Oct 2018	-		0.130	Continuing	Continuing	Continuing
Sys Eng F402 Engine Program	MIPR	DTIC : Fort Belvoir, VA	0.028	0.000		0.000		0.000		-		0.000	0.000	0.028	-
Sys Eng F402 Engine Program	SS/CPFF	Rolls Royce : Bristol, England, UK	75.531	1.778	Jan 2017	2.051	Jan 2018	1.600	Jan 2019	-		1.600	0.000	80.960	80.960
Sys Eng F402 Engine Program	C/FFP	Hood Technology Corp : Hood River, OR	0.845	0.000		0.000		0.000		-		0.000	0.000	0.845	0.845
Sys Eng T58/T64 Engine Program	WR	NAWCAD : Patuxent River, MD	34.829	2.150	Nov 2016	2.501	Nov 2017	2.100	Oct 2018	-		2.100	Continuing	Continuing	Continuing
Sys Eng T58/T64 Engine Program	SS/CPFF	General Electric : Lynn, MA	86.646	1.125	Jan 2017	2.029	Jan 2018	1.700	Jan 2019	-		1.700	0.000	91.500	91.500
Sys Eng T58/T64 Engine Program	C/FFP	Danobat Machine Tool Co. : Humble, TX	0.149	0.000		0.000		0.000		-		0.000	0.000	0.149	0.149
Sys Eng F414/F404 Engine Program	WR	NAWCAD : Patuxent River, MD	42.175	5.500	Nov 2016	6.009	Nov 2017	4.000	Oct 2018	-		4.000	Continuing	Continuing	Continuing
Sys Eng F414/F404 Engine Program	SS/CPFF	General Electric : Lynn, MA	149.668	16.799	Jan 2017	10.649	Jan 2018	15.508	Jan 2019	-		15.508	0.000	192.624	192.624
Sys Eng F414/F404 Engine Program	WR	FRC-SE : Jacksonville, FL	0.585	0.370	Nov 2016	0.268	Nov 2017	0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
Sys Eng F405 Engine Program	WR	NAWCAD : Patuxent River, MD	10.587	1.400	Nov 2016	1.448	Nov 2017	1.400	Oct 2018	-		1.400	Continuing	Continuing	Continuing
Sys Eng F405 Engine Program	SS/CPFF	Rolls Royce : Bristol, England, UK	34.688	2.672	Jan 2017	1.573	Jan 2018	1.046	Jan 2019	-		1.046	0.000	39.979	39.979

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
Sys Eng V-22 Propulsion Program	WR	NAWCAD : Patuxent River, MD	0.785	0.892	Nov 2016	0.961	Nov 2017	1.100	Oct 2018	-		1.100	Continuing	Continuing	Continuing
Sys Eng V-22 Propulsion Program	SS/FFP	Bell- Boeing : Ft. Worth, TX	6.879	0.390	Jan 2017	1.775	Jan 2018	2.100	Jan 2019	-		2.100	0.000	11.144	11.144
Sys Eng V-22 Propulsion Program	SS/CPFF	Rolls Royce : Indianapolis, IN	1.580	1.505	Jan 2017	2.000	Jan 2018	2.000	Jan 2019	-		2.000	0.000	7.085	7.085
Sys Eng V-22 Propulsion Program	C/FFP	Nat'l Center for Manuf'g Sciences : Ann Arbor, MI	0.166	0.000		0.000		0.000		-		0.000	0.000	0.166	0.166
Sys Eng V-22 Propulsion Program	C/FFP	Univ of Dayton Research Inst. : Dayton, OH	0.040	0.000		0.000		0.000		-		0.000	0.000	0.040	0.040
Sys Eng V-22 Propulsion Program	MIPR	Army Research Lab : Aberdeen Proving Ground, MD	0.299	0.000		0.000		0.000		-		0.000	0.000	0.299	-
Sys Eng V-22 Propulsion Program	C/CPFF	UTC Pratt & Whitney : East Hartford, CT	0.138	0.000		0.000		0.000		-		0.000	0.000	0.138	0.138
Sys Eng Adversary J85 Engine Program	WR	FRC-SE : Jacksonville, FL	0.038	0.045	Jan 2017	0.000		0.100	Nov 2018	-		0.100	Continuing	Continuing	Continuing
Sys Eng Adversary J85 Engine Program	WR	NAWCAD : Patuxent River, MD	2.596	1.034	Nov 2016	1.430	Nov 2017	1.500	Oct 2018	-		1.500	Continuing	Continuing	Continuing
Sys Eng Adversary J85 Engine Program	SS/CPFF	General Electric : Lynn, MA	2.052	0.374	Jan 2017	1.230	Jan 2018	0.600	Jan 2019	-		0.600	0.000	4.256	4.256
Sys Eng Adversary J85 Engine Program	C/FFP	UTC Military Engines : East Hartford, CT	0.083	0.000		0.000		0.000		-		0.000	0.000	0.083	0.083
Sys Eng JSF Engine Program	WR	NAWCAD : Patuxent River, MD	5.977	1.000	Nov 2016	1.000	Nov 2017	1.283	Oct 2018	-		1.283	Continuing	Continuing	Continuing
Sys Eng JSF Engine Program	SS/FFP	UTC Pratt & Whitney : East Hartford, CT	21.000	27.479	Jan 2017	31.660	Jan 2018	32.243	Jan 2019	-		32.243	0.000	112.382	112.382

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component 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
Sys Eng JSF Engine Program	WR	FRC-E : Cherry Point, NC	0.003	0.000		0.201	Nov 2017	0.000		-		0.000	0.000	0.204	0.204
Sys Eng P-8A Engine Program	WR	NAWCAD : Patuxent River, MD	1.150	1.150	Nov 2016	0.000		0.600	Oct 2018	-		0.600	Continuing	Continuing	Continuing
Sys Eng Lab Fld Activity-1.0 or more	WR	NAWCAD : Patuxent River, MD	209.090	5.721	Nov 2016	6.448	Nov 2017	4.689	Oct 2018	-		4.689	Continuing	Continuing	Continuing
Sys Eng Other In-House Spt	Various	Various : Various	20.417	0.200	Nov 2016	0.210	Nov 2017	0.220	Nov 2018	-		0.220	Continuing	Continuing	Continuing
GFE*	Reqn	DES/DLA : Various	13.742	0.152	Nov 2016	0.000		1.500	Jan 2019	-		1.500	Continuing	Continuing	Continuing
Prior Year Prod Dev costs no longer funded in the FYDP	Various	Various : Various	62.882	0.000		0.000		0.000		-		0.000	0.000	62.882	-
Sys Eng H-53K Propulsion	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		1.700	Oct 2018	-		1.700	0.000	1.700	-
Sys Eng H-53K Propulsion	SS/CPFF	General Electric : Lynn, MA	0.000	0.000		0.000		6.000	Jan 2019	-		6.000	0.000	6.000	6.000
		Subtotal	1,038.665	88.905		93.850		104.669		-		104.669	Continuing	Continuing	N/A

Remarks

GFE includes expected cost of fuel necessary to support engine development and qualification testing.
Total may be off due to rounding.

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	Various : Various	8.000	0.300	Nov 2016	0.000		0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
Development Support	WR	FRC-SW : North Island, CA	0.823	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Development Support	WR	FRC-E : Cherry Point, NC	0.455	0.000		0.000		0.000		-		0.000	0.000	0.455	-
Development Support	WR	NSWC : Crane, IN	0.160	0.000		0.100	Nov 2017	0.200	Oct 2018	-		0.200	0.000	0.460	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 1355 / *Propulsion and Power Component 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
		Subtotal	9.438	0.300		0.100		0.300		-		0.300	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	Various	Various : Various	3.392	0.050	Nov 2016	0.000		0.100	Oct 2018	-		0.100	Continuing	Continuing	Continuing
Development Test & Evaluation	WR	NSWC : Crane, IN	0.548	0.000		0.000		0.100	Oct 2018	-		0.100	0.000	0.648	-
		Subtotal	3.940	0.050		0.000		0.200		-		0.200	Continuing	Continuing	N/A

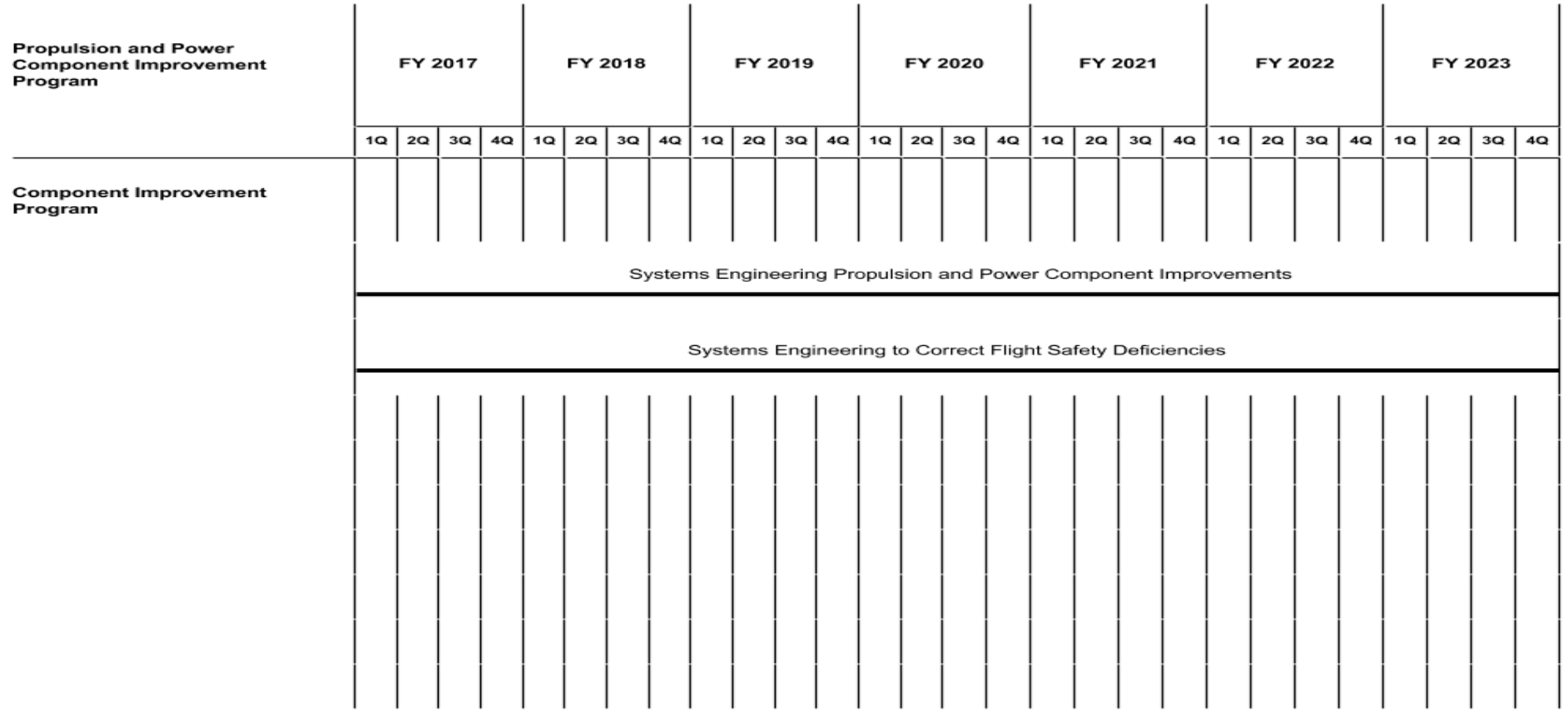
Management Services ($ in Millions)

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	Various	NAVAIR : Patuxent River, MD	0.733	0.048	Oct 2016	0.051	Oct 2017	0.054	Oct 2018	-		0.054	Continuing	Continuing	Continuing
Prior Year Mgmt cost no longer funded in the FYDP	Various	Various : Various	1.447	0.000		0.000		0.000		-		0.000	0.000	1.447	-
		Subtotal	2.180	0.048		0.051		0.054		-		0.054	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	1,054.223	89.303		94.001		105.223		-		105.223	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*



2019DON - 0205633N - 1355

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 1355 / *Propulsion and Power Component Improvement Program*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Propulsion and Power Component Improvement Program				
Component Improvement Program: Engine Improvements	1	2017	4	2023
Component Improvement Program: Power & Propulsion	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield 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
2269: *Expeditionary Airfield Improvements*	41.895	14.685	12.359	1.611	-	1.611	2.077	0.854	0.005	0.000	0.000	73.486
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Expeditionary Airfields (EAF) program was a FY2012 New Start, with funding released to the project in May 2012. The EAF program designs, develops and tests a Sustainment Lighting System (SLS) to replace the obsolete legacy EAF lighting system. This system will provide EAF Marine Aircraft Wing Support Squadrons with the required EAF equipment to install Forward Operating Bases and Forward Arming and Refueling Points. With the deployment of this equipment, the Marine Aircraft Wing Support Squadrons can support all United States Marine Corps (USMC) aircraft allowing the Combatant Commanders the flexibility to deploy Aircraft Combat Elements to meet anticipated threats. Milestone B moved from third quarter of fiscal year 2014 to first quarter of 2015 due to contract negotiation delays.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Expeditionary Airfield Improvements	14.685	12.359	1.611	0.000	1.611
Articles:	-	-	-	-	-
Description: The EAF program designs, develops, tests and fields a Sustainment Lighting System (SLS) to replace the obsolete legacy EAF lighting system. This system will provide EAF Marine Aircraft Wing Support Squadrons with the required EAF equipment to install Forward Operating Bases and Forward Arming and Refueling Points. With the deployment of this equipment the Marine Aircraft Wing Support Squadron can support all USMC aircraft allowing the Combatant Commanders the flexibility to deploy Aircraft Combat Elements to meet anticipated threats.					
FY 2018 Plans: Conduct Test Readiness Review (TRR), begin Developmental Testing (DT) and continue the design, development, and integration of the SLS program.					
FY 2019 Base Plans: Continue the design, development, and integration of the SLS program. Begin Operational Testing (OT) and conduct an Operational Test Readiness Review (OTRR)					
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 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*

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 from FY 2018 to FY 2019 is due to the completion of the design and development phase of the SLS program.					
Accomplishments/Planned Programs Subtotals	14.685	12.359	1.611	0.000	1.611

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: *ASE-Expeditionary Airfields*	6.866	8.230	8.484	-	8.484	8.474	8.698	8.864	9.049	Continuing	Continuing

Remarks

OPN 4213 includes a portion of line item funding for Expeditionary Airfields.

D. Acquisition Strategy

Expeditionary Airfields (EAF): Cost Plus Incentive Fee contract for the system design, development, integration and testing of the Sustainment Lighting System awarded in December 2014.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield 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
Systems Engineering	WR	NAWCAD : Lakehurst, NJ	17.829	6.151	Nov 2016	4.021	Nov 2017	0.487	Nov 2018	-		0.487	0.829	29.317	-
Primary Hardware/ Software Development	C/CPIF	Tactical Lighting Systems, Inc : Addison, Illinois	13.716	6.600	Feb 2017	5.411	Jan 2018	0.515	Jan 2019	-		0.515	0.323	26.565	26.565
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	1.700	0.000		0.000		0.000		-		0.000	0.000	1.700	-
		Subtotal	33.245	12.751		9.432		1.002		-		1.002	1.152	57.582	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	WR	NAWCAD : Lakehurst, NJ	1.958	0.657	Nov 2016	0.545	Nov 2017	0.229	Nov 2018	-		0.229	1.654	5.043	-
Prior Year Support no longer funded in the FYDP	Various	Various : Various	3.637	0.000		0.000		0.000		-		0.000	0.000	3.637	-
		Subtotal	5.595	0.657		0.545		0.229		-		0.229	1.654	8.680	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	NAWCAD : Lakehurst, NJ	1.867	0.859	Nov 2016	1.988	Nov 2017	0.255	Nov 2018	-		0.255	0.125	5.094	-
Opeval Test Support	WR	COMOPTEVFOR : Norfolk, VA	0.126	0.113	Nov 2016	0.166	Nov 2017	0.125	Nov 2018	-		0.125	0.000	0.530	-
		Subtotal	1.993	0.972		2.154		0.380		-		0.380	0.125	5.624	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0205633N / *Aviation Improvements*	Project (Number/Name) 2269 / *Expeditionary Airfield Improvements*	

Management Services ($ in Millions)

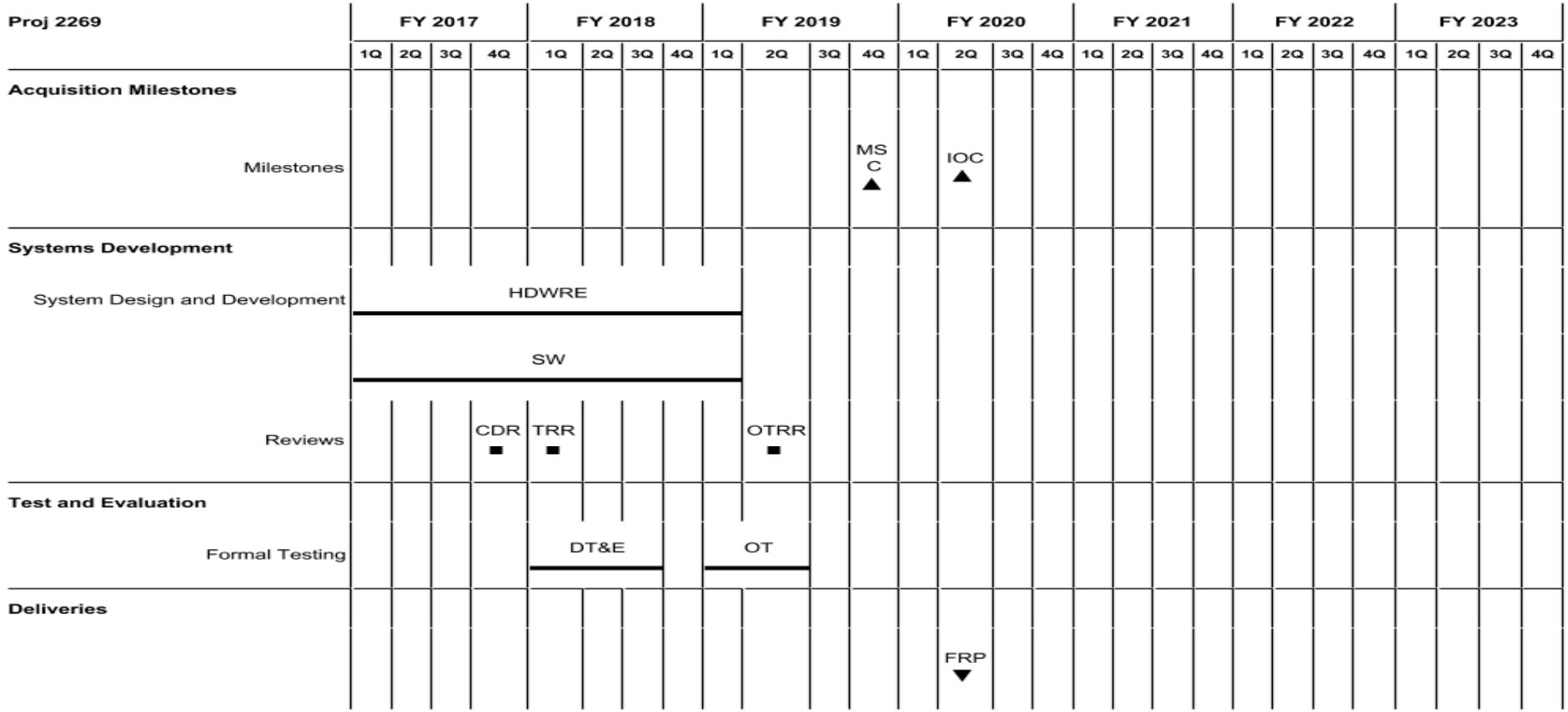
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support Services	C/CPFF	Various : Various	1.062	0.305	Dec 2016	0.228	Dec 2017	0.000		-		0.000	0.000	1.595	1.595
		Subtotal	1.062	0.305		0.228		0.000		-		0.000	0.000	1.595	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	41.895	14.685		12.359		1.611		-		1.611	2.931	73.481	N/A

Remarks

Prior Year includes $4.9 million of Congressional Add funding.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*



2019DON - 0205633N - 2269

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0205633N / *Aviation Improvements*	**Project (Number/Name)** 2269 / *Expeditionary Airfield Improvements*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2269				
Acquisition Milestones: Milestones: Milestone C	4	2019	4	2019
Acquisition Milestones: Milestones: IOC	2	2020	2	2020
Systems Development: System Design and Development: Hardware Development	1	2017	1	2019
Systems Development: System Design and Development: Software Development	1	2017	1	2019
Systems Development: Reviews: Critical Design Review	4	2017	4	2017
Systems Development: Reviews: Test Readiness Review	1	2018	1	2018
Systems Development: Reviews: Operational Test Readiness Review	2	2019	2	2019
Test and Evaluation: Formal Testing: Tech Eval/Dev T&E	1	2018	3	2018
Test and Evaluation: Formal Testing: Operational Testing	1	2019	2	2019
Deliveries: Delivery: Lot 1	2	2020	2	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0205675N *I Operational Nuclear Power 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**
Total Program Element	0.000	101.786	127.445	117.028	-	117.028	106.192	110.313	112.199	123.624	Continuing	Continuing
1303: *Operational Nuclear Power System*	0.000	101.786	127.445	117.028	-	117.028	106.192	110.313	112.199	123.624	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL 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	101.786	127.445	117.028	-	117.028
Current President's Budget	101.786	127.445	117.028	-	117.028
Total Adjustments	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	-	-			
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000

Change Summary Explanation

Technical: Not applicable.
Schedule: Not applicable.

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206313M *I Marine Corps Comms 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	1,396.488	141.171	123.825	174.779	16.130	190.909	148.367	104.147	99.277	110.231	Continuing	Continuing
2270: *Exp Indirect Fire Gen Supt Wpn Sys*	269.803	21.557	27.484	19.553	-	19.553	29.568	20.787	20.905	21.371	Continuing	Continuing
2273: *Air Ops Cmd & Control (C2) Sys*	424.214	13.167	14.630	8.467	-	8.467	7.202	6.858	7.003	7.185	Continuing	Continuing
2274: *Command & Control Warfare Sys*	41.483	5.731	8.129	11.992	-	11.992	6.375	7.122	7.258	7.416	Continuing	Continuing
2275: *Marine Corps Tactical Radio Systems*	41.358	14.465	22.722	23.749	-	23.749	14.254	13.387	13.762	14.044	Continuing	Continuing
2276: *Comms Switching and Control Sys*	42.703	1.791	2.799	1.675	-	1.675	1.778	1.815	1.653	1.686	Continuing	Continuing
2277: *System Engineering and Integration*	43.343	4.763	8.314	4.370	-	4.370	13.010	4.930	5.029	5.133	Continuing	Continuing
2278: *Air Defense Weapons System*	46.369	45.058	24.214	73.605	16.130	89.735	40.743	17.724	13.407	27.369	Continuing	Continuing
2510: *MAGTF CSSE & SE*	294.532	5.501	1.518	1.307	-	1.307	2.310	1.468	1.486	1.520	Continuing	Continuing
3099: *Radar System*	180.131	11.729	14.015	16.435	-	16.435	20.977	18.756	18.623	13.921	Continuing	Continuing
3772: *Information Related Capabilities (IRC)*	0.000	0.000	0.000	5.716	-	5.716	4.349	3.311	1.996	2.264	Continuing	Continuing
3773: *Fire Coordination and Sensors*	0.000	0.000	0.000	7.910	-	7.910	7.801	7.989	8.155	8.322	Continuing	Continuing
9999: *Congressional Adds*	12.552	17.409	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.961

A. Mission Description and Budget Item Justification

This program element provides funding to develop the command and control (C2) support and information infrastructures for the Fleet Marine Force and supporting establishment. Doctrinally, the C2 support system and the information infrastructure form two parts of a triad of capabilities which permits command and control systems to be transformed into a complete operating system. The third element of the triad is command and control organization and is not covered in this program element. USMC command and control is divided into seven functional areas and one supporting functional area as follows: intelligence C2, fire support C2, air operations C2, radio systems C2, combat service support C2, warfare C2, radar systems C2, and C2 support (information processing and communications).

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206313M *I Marine Corps Comms Systems*

Within this program element, subprojects have been grouped by C2 functional area for more efficient planning. Air defense weapons systems have been added to facilitate planning and a separate project is used for systems assigned to the supporting establishment. Subprojects which support the Commander's decision processes have been collected into the Command Post Systems project since these systems must work in close cooperation to ensure effective C2 of Marine Air Ground Task Forces.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	118.146	123.825	95.243	-	95.243
Current President's Budget	141.171	123.825	174.779	16.130	190.909
Total Adjustments	23.025	0.000	79.536	16.130	95.666
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.504	0.000			
• SBIR/STTR Transfer	-3.910	0.000			
• Program Adjustments	5.727	0.000	4.604	-	4.604
• Rate/Misc Adjustments	0.001	0.000	74.932	16.130	91.062
• Congressional General Reductions Adjustments	-0.497	-	-	-	-
• Congressional Directed Reductions Adjustments	-0.800	-	-	-	-
• Congressional Add Adjustments	18.000	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2017	FY 2018
Project: 9999: *Congressional Adds*		
Congressional Add: *Program Increase*	5.803	0.000
Congressional Add: *Radar Enhancements*	11.606	0.000
Congressional Add Subtotals for Project: 9999	17.409	0.000
Congressional Add Totals for all Projects	17.409	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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206313M *I Marine Corps Comms Systems*

Change Summary Explanation

The FY 2019 funding request was reduced by ($.596) 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 funding increase of $67.084M in combined Baseline and OCO funding from FY18 to FY19 can be attributed primarily to Air Defense Weapons System, Command and Control Warfare Systems and Radar Systems.

Exp Indirect Fire Gen Supt Wpn Sys funding decrease reflects transition of Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS) and Target Hand-Off System (THS) from Project C2270 to C3773 Fire Coordination and Sensors in FY19 to reflect US Marine Corps (USMC) Program Management Office (PMO) reorganization to improve support of USMC Operating Forces (OPFOR).

Air Operation Command and Control (C2) System funding decrease reflects transition of Combat Operations Center (COC) from Project C2273 to C2275 Radio Systems in FY19 to reflect USMC PMO reorganization to improve support of USMC OPFOR.

Command and Control Warfare systems increase of $3.863M from FY18 to FY19 supports Multi- Function Electronic Warfare (MFEW) development and additional loadset development for advanced threats.

Tactical Radio Systems increase reflects completion of most NOTM-Airborne (NOTM-A) development and testing. Combat Operations Center (COC) transitions from Project C2273 Air Operation C2 System to C2275 in FY19 to reflect USMC PMO reorganization to improve support of USMC OPFOR.

Communications Switching & Control Systems decrease reflects transition of the Network Planning and Management (NPM) program to sustainment.

Systems Engineering and Integration decrease reflects transition of Marine Civil Information Management System (MARCIMS), Public Affairs Systems (PAS) and Military Information Support Operations (MISO) from Project C2277 to C3772 Information Related Capabilities (IRC) in FY19 to reflect USMC PMO reorganization to improve support of USMC OPFOR.

Air Defense Weapons System $65.521M increase from FY18 to FY19, in combined baseline and OCO funding, reflects the Marine Corps continued urgent need to address emergency war fighting requirements for a Ground Based Air Defense (GBAD) Future Weapons System (FWS) and the Commandant of the Marine Corp (CMC) directed Counter-UAS (C-UAS) assessment, engineering and acquisition efforts to determine and pursue technology solutions required to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission.

Radar Systems increase of $2.420M from FY18 to FY19 supports enhanced software development for AN/TPS-59 Tactical Ballistic Missile (TBM) detection as well as enhanced data analysis and engineering modeling of threat profiles to support the TBM software enhancements. The FY 2019 funding request was reduced by $9.553M 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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206313M *I Marine Corps Comms Systems*

Information Related Capabilities (IRC) is a new subproject in FY19 which includes Marine Civil Information Management System (MARCIMS), Public Affairs System (PAS) and Military Information Support Operations (MISO) which transitioned from Project C2277 System Engineering and Integration in FY19 to reflect USMC Program Management Office (PMO) reorganization to improve support of US Marine Corps Operating Forces. IRC capabilities provide the Marine Air Ground Task Force (MAGTF) and the broader Marine Corps the capability to research, understand and affect the information environment, as well as conduct planned operations to convey selected information and indicators to foreign adversary, neutral and friendly target audiences to influence their emotions, motives, and objective reasoning, to provide an operational advantage.

Fire Coordination and Sensors is a new subproject in FY19 which includes AFATDS and THS from Project C2273 and Family of Target Acquisition Systems (FTAS) from Project C3099 Radar Systems to reflect USMC PMO reorganization to improve support of USMC OPFOR. This project provides capability to automate the fire planning, tactical fire direction, and fire support coordination required to support maneuver from the sea and subsequent operations ashore, as well as the capability to locate, identify, and attack enemy indirect fire weapons systems and observe and direct friendly artillery fire. It also provides MAGTF Commanders with the only man-portable target location capability that allows Air Officers and Fire Support Coordinators to prosecute identified targets.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2270 / *Exp Indirect Fire Gen Supt Wpn 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
2270: *Exp Indirect Fire Gen Supt Wpn Sys*	269.803	21.557	27.484	19.553	-	19.553	29.568	20.787	20.905	21.371	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, AFATDS FoS and THS funding has been realigned from project 2270, Command Post Systems. Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR. This realignment is the primary cause of the funding decrease of $7.931M from FY18 to FY19.

A. Mission Description and Budget Item Justification

Marine Air Ground Task Force (MAGTF) Command and Control (C2) Systems and Applications (MAGTF C2 SA) - MAGTF C2 SA merges the development, integration and testing of 45 existing C2 systems and applications into one common enterprise capability. They reside in all Combat Operations Centers (COCs) and related USMC C2 platforms. This effort provides greater economies of scale/affordability with system developers, technical design agents, integration agents and individual program offices. MAGTF C2 SA efforts are in alignment with the combat developers requirements for: Net-Centric systems, Development of reusable Open Architecture components, Data exposure, Enhancing the Warfighter's Situational Awareness and Increasing/Maximizing the Commander's decision space.

Joint Battle Command - Platform (JBC-P) Family of Systems (FoS) - JBC-P FoS is an Army led ACAT II program of Joint Requirements Oversight Council (JROC) interest, formerly known as the Blue Force Tracker (BFT) FoS. It is comprised of L-Band SATCOM and is a digital, battle command information FoS that provides integrated, on the move, timely, relevant Command and Control Situational Awareness (C2SA) information to tactical combat, combat support and combat service support commanders, leaders, and key C2 nodes. JBC-P FoS will provide JROC mandated C2SA convergence across Combat Operations Centers (COC), ground vehicles and dismounted personnel.

Identity Dominance System-MC (IDS-MC) - IDS-MC is a multi-modal (fingerprint, iris and face) biometric collection system that provides the USMC a reliable and effective capability to collect, share, match, access, verify and store identity information. IDS-MC will enable the Marine to collect appropriate biometric, biographical and reference information on an individual and match this locally developed information with pre-existing information available to the expeditionary force. The system will display match results with linkage to the respective individual's biographical and reference information as well as help analyze the response, update records as appropriate, create reports and disseminate updated information. The primary mission of IDS-MC is to provide the Marine Corps with the means to identify persons encountered in the battle space. While IDS-MC is not an intelligence analysis system, it does provide identification information in support of military intelligence and law enforcement operations by providing positive identification of persons of interest. IDS-MC is an enabler in the areas of detainee management and questioning, base access, counterintelligence screening, border control, law enforcement, displaced persons' management and aiding in humanitarian assistance missions. IDS-MC supports the tactical application of identity dominance and fully supports a forward presence, crisis response and contingency response capability.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

The Expeditionary Forensics and Exploitation Capability (EFEC) provides tactical and operational level forensic technical exploitation capabilities required by Marine Corps forward deployed forces. EFEC provides organic Marine Corps forensic capabilities that support the tactical commander with agile, ruggedized, and scalable expeditionary forensic capabilities that are compatible and fully integrated with joint, other Service, and interagency laboratories, yet also tailored to the unique operating requirements of the maritime domain. Maritime applications include the ability to support Marine Expeditionary Units and ruggedized construction for deployment of sensitive forensic testing and analysis equipment. Through the ability to recognize, protect, collect, analyze, store and share items with forensic value, EFEC positively identifies personnel and trace chemicals/elements; forensically exploits document and media in the commander's area of operation; and scientifically links identities and networks to places, events, and activities. It is a critical enabler to force protection, Counter Improvised Explosive Device, intelligence, targeting and law enforcement operations.

Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS) - AFATDS FoS consists of three programs, AFATDS, Back Up Computer System (BUCS) and Mobile Tactical Shelter (MTS). The AFATDS automates the fire planning, tactical fire direction, and fire support coordination required to support maneuver from the sea and subsequent operations ashore. AFATDS integrates all supporting arms assets within the MAGTF such as mortars, cannon artillery, rockets and missiles, close air support, and naval surface fire support systems. BUCS is a hand-held computer system designed to provide a backup to the AFATDS in computing ballistic firing solutions, as well as provide survey and Meteorological functions in support of artillery. Additionally BUCS is the primary ballistic firing solution system during Ship To Objective Maneuver (STOM) and for the Expeditionary Fire Support System (EFSS). The MTS is a Lightweight Multi-purpose Shelter mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) which protects both the AFATDS and operators from the environment. MTS enables rapid emplacement and displacement of fire support elements and provides networked communications on the move. Realignment of effort to new Project (C3773) in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

Target Hand-Off System (THS) - The THS addressed a Marine Corps operational requirement for a lightweight, handheld, and accurate target acquisition engagement coordination system. THS provides MAGTF Commanders with the only man-portable target location capability that allows Air Officers and Fire Support Coordinators to prosecute identified targets. The THS' advance interoperability capability provides the MAGTF Commander with the only portable target acquisition system able to interoperate with all target prosecution platforms available in the battlefield. The THS is designed for the Forward Air Controllers (FACs), Forward Observers (FOs), Fire Support Teams (FSTs), Firepower Control Teams (FCTs), Tactical Air Control Parties (TACPs) and Reconnaissance Teams to quickly acquire targets in day, night and near-all-weather visibility conditions, in order to conduct precise, rapid indirect surface fire support, Naval Surface Fire Support (NSFS) and Close Air Support (CAS). FY19 increase is due to a realignment from PROJECT C2270 to PROJECT C3773. Realignment of effort to new Project in FY 19 and beyond reflects USMC Program Management Office (PMO)reorganization to improve support of USMC OPFOR.

Handheld Command and Control (H2C2) - H2C2 project vision outlines a collective and efficient mobile computing Acquisition Strategy to ensure economies of scale and scope. The H2C2 portfolio consists of two specific capabilities - secure wireless access to multiple networks and handheld communication platforms. The handheld capability provides low cost (commercially available) platforms (smartphones and tablets) for use on every network regardless of the operational environment. The emerging technologies will enable access to both classified and unclassified systems on a single device. The secure wireless capability enables Marines burdened

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

by wired implementations an option to leverage wireless mediums. This capability provides wireless communication between a variety of devices. Starting in FY18, Handheld efforts were re-aligned from JBC-P 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: MAGTF C2: Product Development	6.123	9.548	10.022	0.000	10.022
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue the addition of Authoritative Data Sources from Intelligence, Logistics and Operations to the TSOA in order to meet identified Marine Corps gaps. -Continue improving and enhancing MAGTF interoperability using the service oriented architecture provided by the TSOA. -Continue developing applications for the Marine Corps Software Resource Center to enable more effective information sharing and the ability for Marines to make more informed and timely decisions. -Continue research and development for the deployment of the TSOA to additional Marine Corps platforms (NOTM and MCEITS). - The increase of $2.711M from FY17 to FY18 will fund improvements and enhancements to Software Release, Marine Corps Enterprise Information Technology Services (MCEITS), and Marine Corps Software Resource Center (MCSRC).					
FY 2019 Base Plans: -Continue the addition of Authoritative Data Sources from Intelligence, Logistics and Operations to the TSOA in order to meet identified Marine Corps gaps. -Continue improving and enhancing MAGTF interoperability using the service oriented architecture provided by the TSOA. -Continue developing applications for the Marine Corps Software Resource Center to enable more effective information sharing and the ability for Marines to make more informed and timely decisions. -Continue research and development for the deployment of the TSOA to additional Marine Corps platforms (NOTM and MCEITS). - The increase of $0.474M from FY18 to FY19 will fund improvements and enhancements to Software Release, Marine Corps Enterprise Information Technology Services (MCEITS), and Marine Corps Software Resource Center (MCSRC) and integration, engineering and information assurance of Tactical Service Oriented Architecture (TSOA) software products.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

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 significant change from FY 2018 to FY 2019.					
Title: MAGTF C2: Support Costs	1.207	1.369	1.387	0.000	1.387
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue system engineering support for system integration, configuration management and technical assessments. ***FY 2019 Base Plans:*** - Continue system engineering support for system integration, configuration management, and technical assessments. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: MAGTF C2: Test and Evaluation	1.425	1.659	1.057	0.000	1.057
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete test support for the Joint Tactical Common Operational (COP) Workstation (JTCW). -Continue to participate in technical working groups in support of test and engineering. -Continue to provide technical assistance to other programs supported by Marine Corps Tactical Systems Support Activity (MCTSSA) that involve the use of these systems as well as through the Operating forces Tactical Systems Support Center (OFTSSC) trouble calls ***FY 2019 Base Plans:*** -Continue to participate in technical working groups in support of test and engineering. -Continue to provide technical assistance to other programs supported by Marine Corps Tactical Systems Support Activity (MCTSSA) that involve the use of these systems as well as through the Operating forces Tactical Systems Support Center (OFTSSC) trouble calls. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

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 significant change from FY 2018 to FY 2019.					
Title: MAGTF C2: Management Services	1.275	1.300	1.296	0.000	1.296
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to receive software engineering support to provide appropriate government direction in design and development of software, conduct of source code reviews and prime vendor oversight from Federally Funded Research and Development Center (FFRDC). ***FY 2019 Base Plans:*** -Continue to receive software engineering support to provide appropriate government direction in design and development of software, conduct of source code reviews and prime vendor oversight from Federally Funded Research and Development Center (FFRDC). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: AFATDS: Software Development and Integration	2.029	4.565	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete development of AFATDS software version 6.8.1.1 P2. - Initiate development of AFATDS software version 7.0. ***FY 2019 Base Plans:*** - See Project C3773. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Beginning in FY19, AFATDS FoS and THS funding has been realigned from project 2270, Command Post Systems. Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR. This realignment is the primary cause of the funding decrease of $7.931M from FY18 to FY19.					
Title: AFATDS: Test and Evaluation ***Articles:*** ***FY 2018 Plans:*** - Complete tests to support G/ATOR and PERM Initial Operational Test and Evaluation (IOT&E) of functionality within AFATDS software version 6.8.1.1. P2. - Continue interoperability testing for AFATDS and BUCS software between all required Joint C2 and Fires systems. ***FY 2019 Base Plans:*** - See Project C3773. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, AFATDS FoS and THS funding has been realigned from project 2270, Command Post Systems. Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR. This realignment is the primary cause of the funding decrease of $7.931M from FY18 to FY19.	0.435 -	0.305 -	0.000 -	0.000 -	0.000 -
Title: AFATDS: Management Services ***Articles:*** ***FY 2018 Plans:*** - Continue to provide Engineering Support personnel and travel. ***FY 2019 Base Plans:*** - See Project C3773. ***FY 2019 OCO Plans:***	0.650 -	1.011 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

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:*** Beginning in FY19, AFATDS FoS and THS funding has been realigned from project 2270, Command Post Systems. Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR. This realignment is the primary cause of the funding decrease of $7.931M from FY18 to FY19.					
Title: THS: Product Development ***Articles:*** ***FY 2018 Plans:*** -Continue development of THS V2 software. ***FY 2019 Base Plans:*** See Project C3773. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, AFATDS FoS and THS funding has been realigned from project 2270, Command Post Systems. Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR. This realignment is the primary cause of the funding decrease of $7.931M from FY18 to FY19.	2.420 -	1.661 -	0.000 -	0.000 -	0.000 -
Title: EFEC: Test and Evaluation ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** -Initiate coordination with government labs and industry for product testing and integration of Commercial Off-the-Shelf (COTS) capabilities for the EFEC system design. ***FY 2019 OCO Plans:***	0.000 -	0.000 -	0.400 -	0.000 -	0.400 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

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 $0.400M from FY18 to FY19 initiates EFEC product testing and integration efforts.					
Title: IDS-MC: Support	0.709	0.883	0.976	0.000	0.976
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue capability requirements analysis to initiate development for IDS-MC Increment 2 - Continue to develop, assess, and integrate emerging technologies for the IDS-MC Increment 2 integrated system design. ***FY 2019 Base Plans:*** - Continue to develop, assess, and integrate technologies for the IDS-MC Increment 2 integrated system design. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: JBC-P: Software and Product Development/Integration	2.675	1.393	0.295	0.000	0.295
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue coordination with the software and product development teams to assist in the development and integration of the JBC-P software capability and associated testing. -Continue software engineering support to provide appropriate government direction in design and development of software. ***FY 2019 Base Plans:*** -Continue coordination with the software and product development teams to assist in the development and integration of the JBC-P software capability and associated testing. -Continue software engineering support to provide appropriate government direction in design and development of software. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

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 $1.098M from FY18 to FY19 is aligned to the schedule for test and evaluation and systems engineering.					
Title: JBC-P: Test and Evaluation	0.921	0.325	0.589	0.000	0.589
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue laboratories integration to facilitate test and network integration test events. ***FY 2019 Base Plans:*** -Continue laboratories integration to facilitate test and network integration test events. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: H2C2: Test and Evaluation	0.000	1.681	1.430	0.000	1.430
Articles:	-	-	-	-	-
FY 2018 Plans: -Initiate test and evaluation efforts for Handheld end user device. ***FY 2019 Base Plans:*** -Continue Test and Evaluation efforts for the Handheld end user device. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: H2C2: Integration Engineering Support	1.688	1.784	2.101	0.000	2.101
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to develop, design, test, and integrate various emerging capabilities across the H2C2 portfolio.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

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 support for sustained engagement with various industry providers, quick look technology excursions, and experimentation demonstrations for high risk emerging technology. -Continue support for certification and accreditation efforts for handheld device. ***FY 2019 Base Plans:*** -Continue to develop, design, test, and integrate various emerging capabilities across the H2C2 portfolio. -Continue to provide support for sustained engagement with various industry providers, quick look technology excursions, and experimentation demonstrations for high risk emerging technology. -Continue support for certification and accreditation efforts for handheld device. -Increase of $0.317M from FY18 to FY19 for software development efforts. ***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	21.557	27.484	19.553	0.000	19.553

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/6438BB: *IDS-MC*	0.496	0.498	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.324
• PMC/4631DD: *AFATDS*	3.596	15.697	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	44.716
• PMC/4631FF: *JBC-P*	40.312	29.740	26.021	-	26.021	8.161	8.336	8.492	8.702	Continuing	Continuing
• PMC/4631GG: *THS*	0.000	22.350	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	33.140
• RDTE/C3773A: *AFATDS*	0.000	0.000	5.606	-	5.606	5.763	5.911	6.042	6.166	Continuing	Continuing
• PMC/4652AA: *IDS-MC*	0.000	0.000	0.971	-	0.971	4.945	1.007	0.000	0.000	Continuing	Continuing
• RDTE/C3773B: *THS*	0.000	0.000	0.678	-	0.678	0.409	0.418	0.426	0.435	Continuing	Continuing
• PMC/4733AA: *THS*	0.000	0.000	24.739	-	24.739	2.439	2.487	2.537	2.588	Continuing	Continuing
• PMC/4733BB: *AFATDS*	0.000	0.000	12.521	-	12.521	12.852	15.531	15.908	16.245	Continuing	Continuing
• PMC/4652BB: *EFEC*	0.000	0.750	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.750
• PMC/4631HH: *H2C2*	0.000	0.000	0.000	-	0.000	11.518	0.000	0.000	0.000	0.000	11.518

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

D. Acquisition Strategy

MAGTF C2 SA: The initial focus is developing the Tactical Service Oriented Architecture (TSOA) software, which provides a common software infrastructure through which services and applications from other programs of record can begin the process of interfacing with in order to maximize software commonality across echelons and missions. The long term goal is a software capability that will enable data discovery and data sharing across mission areas, a common standards-based viewer, core services and applications, and access to the Global Information Grid (GIG) and other Joint networks, data and services.

JBC-P: JBC-P FoS is leveraging the Army's development of the JBC-P. The Marine Corps program is contingent upon the Army's development and acquisition strategy. The Army will fund research and development for JBC-P unless there are Service unique requirements, which the Marine Corps program office will fund. The Marine Corps program office will participate in all design and readiness reviews and joint operational testing events.

Identity Dominance System (IDS): For IDS-MC Increment 1, the Program Office acquisition strategy leveraged the Navy's IDS Program and provided funding to enhance the Navy's system to meet Marine Corps requirements. The Marine Corps program office participated in all design and technical reviews as well as the FOT&E activities. For IDS-MC Increment 2, the Marine Corps Program Office is collaborating with the Army and Navy to leverage market research and technology demonstration data for system hardware and software selection in support of technical refresh. The Marine Corps plans to conduct technology assessments in FY17, conduct PDR and CDR in FY18, MS C in FY19, and Full Deployment Decision (with system procurement) in FY20. and The long-term goal is to equip the Marine with a user-friendly biometric authentication technology that will be employed throughout DoD to deny the enemy freedom of movement within the populace and positively identify known insurgents within an Area of Responsibility (AOR). R&D efforts will be a combined effort with the Navy PM and the USMC for IDS Increment 2, and led by the Marine Corps Program Office.

EFEC: EFEC will use the evolutionary approach for technology insertion and enhancements. For EFEC Increment 2, the Marine Corps will conduct market research and technology demonstrations with industry to replace EFEC Increment 1 hardware and software. The acquisition of components (software/hardware) will maximize the use of existing COTS, Non-Developmental Items, and Government Furnished Equipment for the Information Technology components.

AFATDS: AFATDS is managed through Army CECOM, Aberdeen Proving Ground, MD. R&D efforts for the next AFATDS version will be a combined effort between the software developer, the Army PM, and the USMC for software enhancements through DISA. Current software enhancements are performed at Army, Ft. Sill, OK.

THS: The acquisition of components (software/hardware) for the THS initiative will maximize the use of existing COTS, Government-Off-The-Shelf (GOTS), Non-Developmental Item (NDI), and Government Furnished Equipment (GFE). Software is transitioning to a government owned baseline. Software must maintain compatibility with five Programs of Record (POR) and seven Operational Flight Programs (OFP).

H2C2: H2C2 will use an evolutionary approach for technology insertion. The approach will leverage and mature COTS and NDI technologies to rapidly transition a handheld data capability to other acquisition programs. H2C2 inserts mature technology into existing programs in order to fill capability gaps and requirement shortfalls. These technologies will be inserted at different times along gaining program acquisition cycles. This strategy will apply to available technology at different proposed technology insertion points for each gaining program.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2270 / *Exp Indirect Fire Gen Supt Wpn 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
MAGTF C2	C/CPFF	SPAWAR : Charleston, SC	50.926	1.598	Jun 2017	5.848	Apr 2018	6.658	Apr 2019	-		6.658	Continuing	Continuing	Continuing
MAGTF C2	WR	NSWC : Dahlgren, VA	11.038	1.086	Feb 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MAGTF C2.	C/CPFF	SPAWAR : San Diego, CA	5.355	1.000	Aug 2017	1.200	Apr 2018	1.000	May 2019	-		1.000	Continuing	Continuing	Continuing
MAGTF C2	WR	SSC A : Charleston, SC	6.593	1.439	Jan 2017	2.000	Feb 2018	1.500	Feb 2019	-		1.500	Continuing	Continuing	Continuing
MAGTF C2	WR	ARL : Washington, DC	1.283	0.700	Jun 2017	0.500	Mar 2018	0.864	Jun 2019	-		0.864	Continuing	Continuing	Continuing
MAGTF C2	C/CPFF	NSWC2 : Dahlgren, VA	0.260	0.300	Jun 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
AFATDS	MIPR	DISA : Belleville, IL	0.000	0.964	Sep 2017	3.893	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
AFATDS	MIPR	Army/SEC : Fort Sill, OK	0.000	1.500	Mar 2017	1.318	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
THS	C/IDIQ	NAVSEA : Washington, DC	0.000	0.331	Mar 2017	0.000		0.000		-		0.000	0.000	0.331	-
THS	WR	NAWC - China Lake : China Lake, CA	0.000	0.754	May 2017	0.000		0.000		-		0.000	0.000	0.754	-
THS	MIPR	AMRDEC : Huntsville, AL	5.413	1.335	Mar 2017	1.661	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
JBC-P	WR	SPAWAR : Charleston, SC	3.211	0.299	Jan 2017	0.287	Dec 2017	0.200	Dec 2018	-		0.200	Continuing	Continuing	Continuing
JBC-P	C/CPFF	SPAWAR2 : Charleston, SC	0.581	0.241	May 2017	0.211	Dec 2017	0.095	Dec 2018	-		0.095	Continuing	Continuing	Continuing
JBC-P	C/CPFF	NSWC2 : Crane, IN	0.211	0.188	Jun 2017	0.386	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
JBC-P	WR	DPSS : China Lake, CA	0.000	0.565	Feb 2017	0.509	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
JBC-P	WR	DPSS2 : China Lake, CA	0.000	1.382	Jul 2017	0.000		0.000		-		0.000	0.000	1.382	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2270 / *Exp Indirect Fire Gen Supt Wpn 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
Prior Years Cumulative Funding	Various	Various : Various	133.461	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	218.332	13.682		17.813		10.317		-		10.317	Continuing	Continuing	N/A

Remarks

Funding decrease in FY19 is due to AFATDS FoS, FTAS and THS funding being realigned to other RDTEN PRJs in 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
MAGTF C2	WR	SPAWAR : San Diego, CA	4.948	1.207	Jan 2017	1.369	Feb 2018	1.387	Feb 2019	-		1.387	Continuing	Continuing	Continuing
H2C2 Integration Eng	WR	SPAWAR : Charleston, SC	2.573	0.911	Dec 2016	0.200	Dec 2017	0.575	Dec 2018	-		0.575	Continuing	Continuing	Continuing
H2C2 Integration Eng	C/FFP	SPAWAR : Charleston, SC	0.369	0.295	Dec 2016	0.255	Dec 2017	0.248	Dec 2018	-		0.248	Continuing	Continuing	Continuing
H2C2 Integration Eng	WR	NSWC Crane : Crane, IN	0.626	0.482	Nov 2016	0.295	Nov 2017	0.301	Nov 2018	-		0.301	Continuing	Continuing	Continuing
H2C2 Integration Eng	WR	NSWC China Lake : China Lake, CA	0.615	0.000		0.819	Dec 2017	0.860	Dec 2018	-		0.860	Continuing	Continuing	Continuing
H2C2 Integration Eng	C/CPFF	NSWC Crane2 : Crane, IN	0.060	0.000		0.115	Jun 2018	0.117	Jun 2019	-		0.117	Continuing	Continuing	Continuing
H2C2 Integration Eng	Various	MCSC : Stafford, VA	0.100	0.000		0.100	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
IDS-MC	C/FFP	MITRE : Mc Lean, Va	0.000	0.148	Feb 2017	0.000		0.000		-		0.000	0.000	0.148	-
IDS-MC	WR	SPAWAR : Charleston, SC	0.036	0.520	Nov 2016	0.883	Mar 2018	0.976	Nov 2018	-		0.976	Continuing	Continuing	Continuing
IDS-MC	C/FFP	NSWC Dahlgren : Dahlgren, VA	0.000	0.041	Mar 2017	0.000		0.000		-		0.000	0.000	0.041	-
Prior Years Cumulative Funding	Various	Various : Various	10.078	0.000		0.000		0.000		-		0.000	0.000	10.078	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*	

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	19.405	3.604		4.036		4.464		-		4.464	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
MAGTF C2	WR	NRL : Washington, DC	2.333	0.825	Jun 2017	0.859	Feb 2018	0.500	Jun 2019	-		0.500	Continuing	Continuing	Continuing
MAGTF C2	C/ FFPLOE	MCTSSA. : Camp Pendleton, CA	2.891	0.600	Jun 2017	0.800	Jan 2018	0.557	Apr 2019	-		0.557	Continuing	Continuing	Continuing
JBC-P	C/CPFF	MCTSAA : Camp Pendleton, CA	1.198	0.287	Dec 2016	0.235	Mar 2018	0.296	Dec 2018	-		0.296	Continuing	Continuing	Continuing
JBC-P	MIPR	DISA/JITC : Ft Huachuca, AZ	0.253	0.000		0.090	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
JBC-P	WR	NSWC Corona4 : Norco, CA	0.000	0.289	Feb 2017	0.000		0.166	Feb 2019	-		0.166	0.000	0.455	-
JBC-P	C/FFP	NSWC Corona 5 : Norco, CA	0.000	0.345	Jun 2017	0.000		0.127	Jun 2019	-		0.127	0.000	0.472	-
H2C2	WR	SPAWAR1 : Charleston, SC	0.000	0.000		0.335	Dec 2017	0.341	Dec 2018	-		0.341	0.000	0.676	-
H2C2	WR	NSWC Corona : Norco, CA	0.000	0.000		0.865	Dec 2017	0.435	Dec 2018	-		0.435	0.000	1.300	-
H2C2	C/FFP	SPAWAR2 : Charleston, SC	0.000	0.000		0.200	Dec 2017	0.203	Dec 2018	-		0.203	0.000	0.403	-
H2C2	C/FFP	NSWC Corona : Norco, CA	0.000	0.000		0.200	Dec 2017	0.203	Dec 2018	-		0.203	0.000	0.403	-
H2C2	WR	NSWC China Lake : China Lake, CA	0.000	0.000		0.081	Dec 2017	0.248	Dec 2018	-		0.248	0.000	0.329	-
EFEC	WR	SPAWAR3 : Charleston, SC	0.000	0.000		0.000		0.400	Nov 2018	-		0.400	0.000	0.400	-
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	15.688	0.000		0.000		0.000		-		0.000	0.000	15.688	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2270 / *Exp Indirect Fire Gen Supt Wpn 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
		Subtotal	22.363	2.346		3.665		3.476		-		3.476	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
MAGTF C2	C/CPFF	CECOM/MITRE : Ft. Monmouth, NJ	6.252	1.275	Jun 2017	1.300	Dec 2017	1.296	Jun 2019	-		1.296	Continuing	Continuing	Continuing
AFATDS	C/CPFF	CECOM/MITRE : Ft. Monmouth, NJ	0.160	0.650	Jan 2017	0.670	Jan 2018	0.000		-		0.000	0.000	1.480	-
Prior Years Cumulative Funding	Various	Various : Various	3.291	0.000		0.000		0.000		-		0.000	0.000	3.291	-
		Subtotal	9.703	1.925		1.970		1.296		-		1.296	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	269.803	21.557		27.484		19.553		-		19.553	Continuing	Continuing	N/A

Remarks

Funding decrease in FY19 is due to AFATDS FoS, FTAS and THS funding being realigned to other RDTEN PRJs in FY19.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

MAGTF C2 Schedule

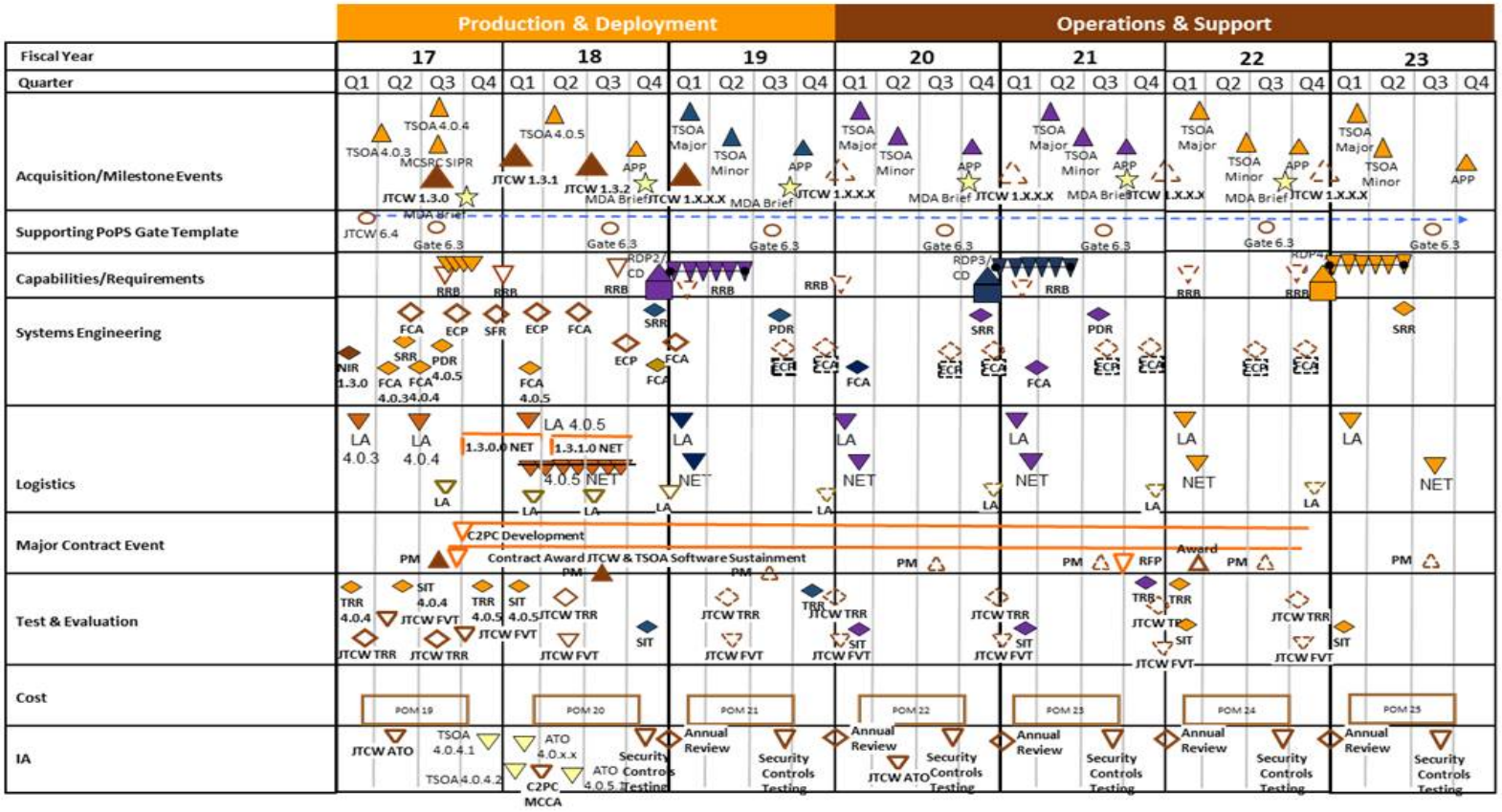


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

Hand Held Command and Control (H2C2) Program Schedule

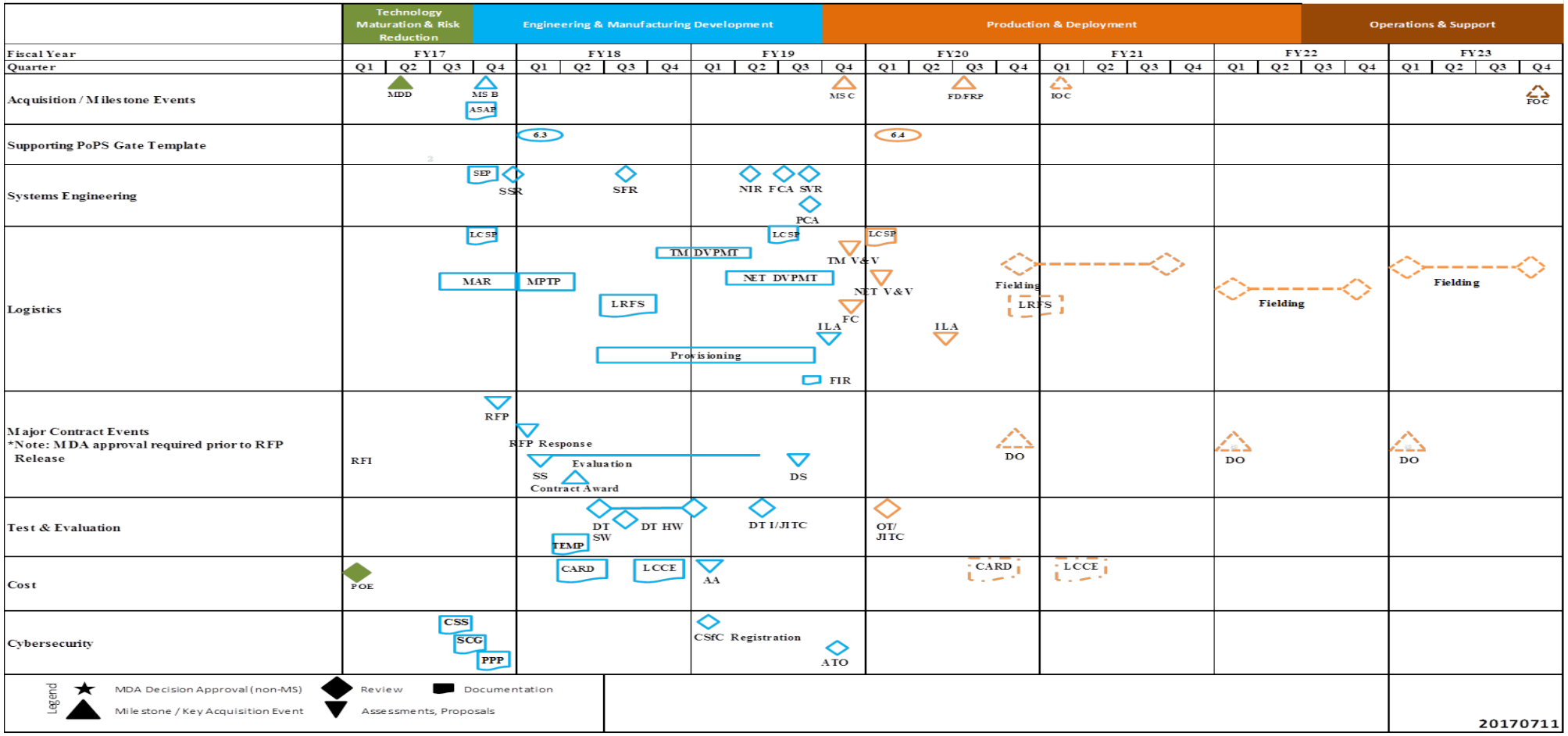


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

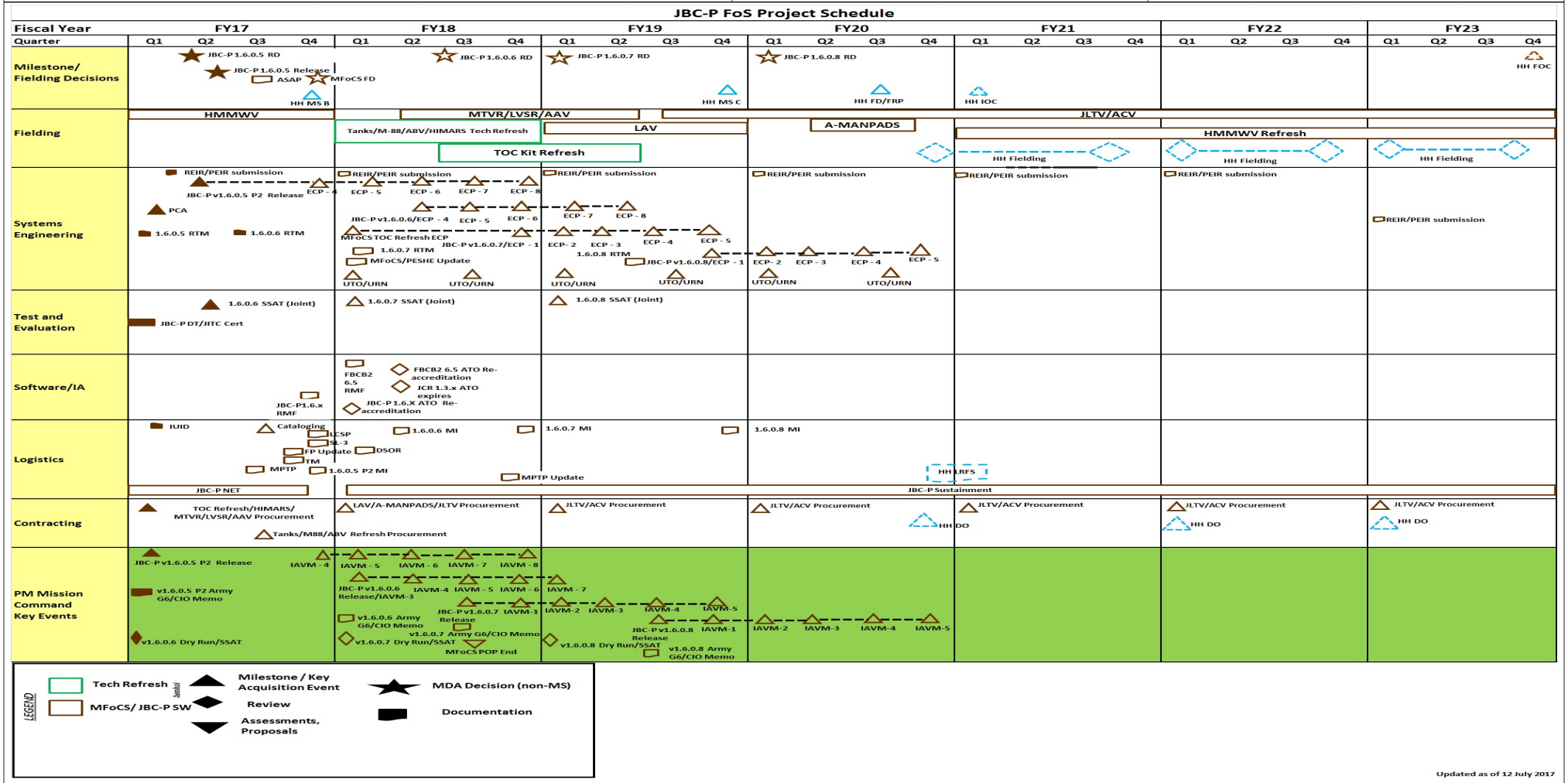


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

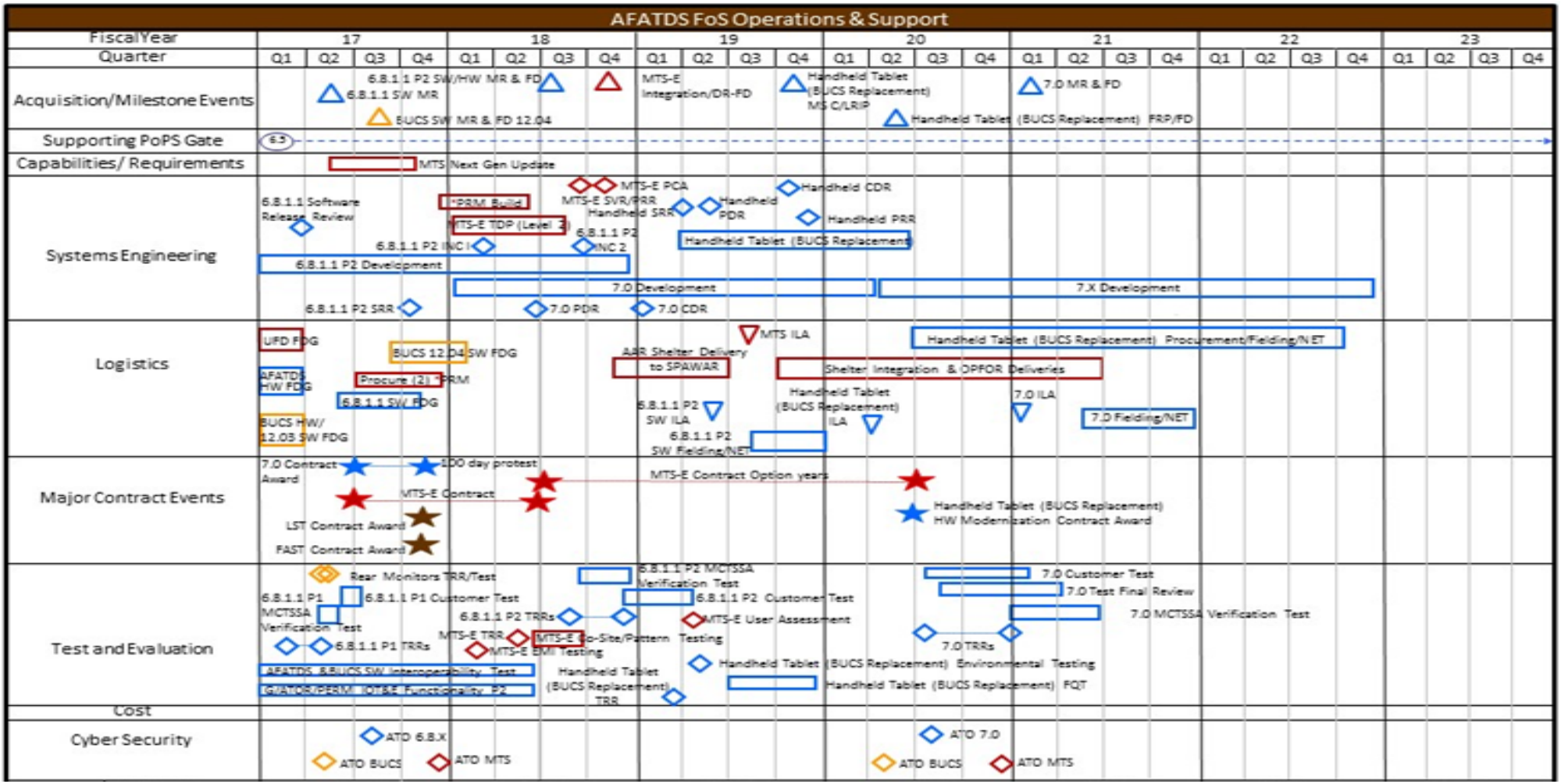


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

Identity Dominance System – Marine Corps (IDS-MC) Program Schedule

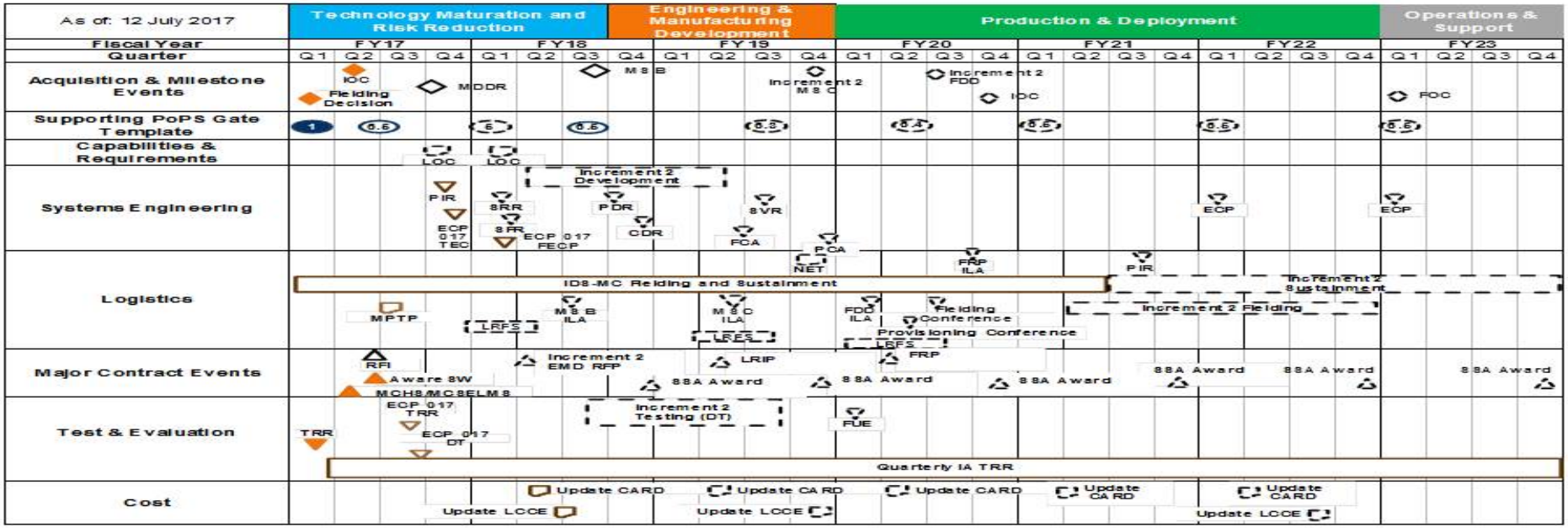


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

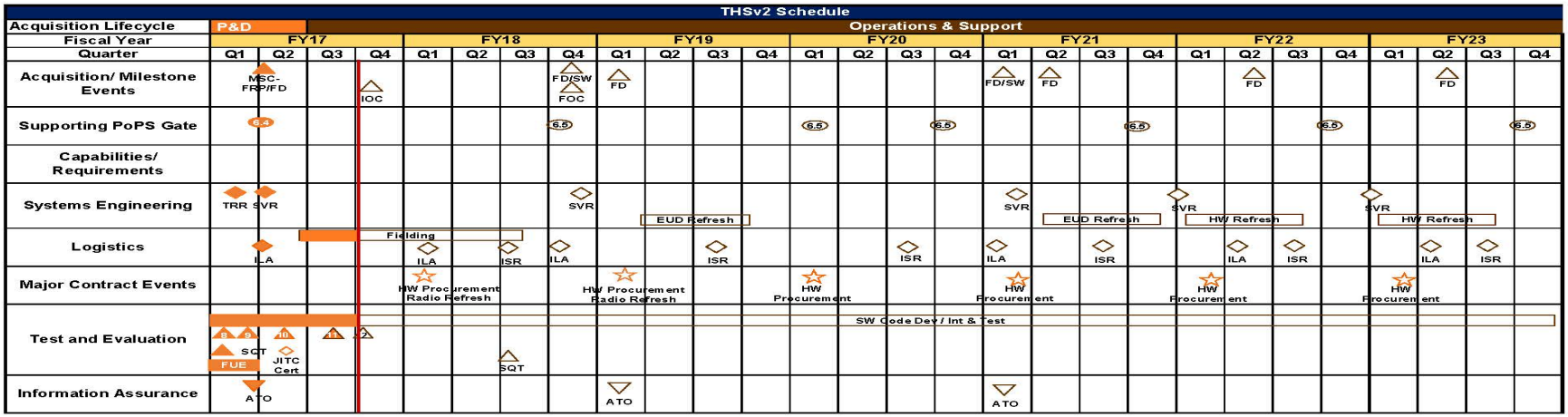


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

Expeditionary Forensic Exploitation Capability (EFEC) Program Schedule

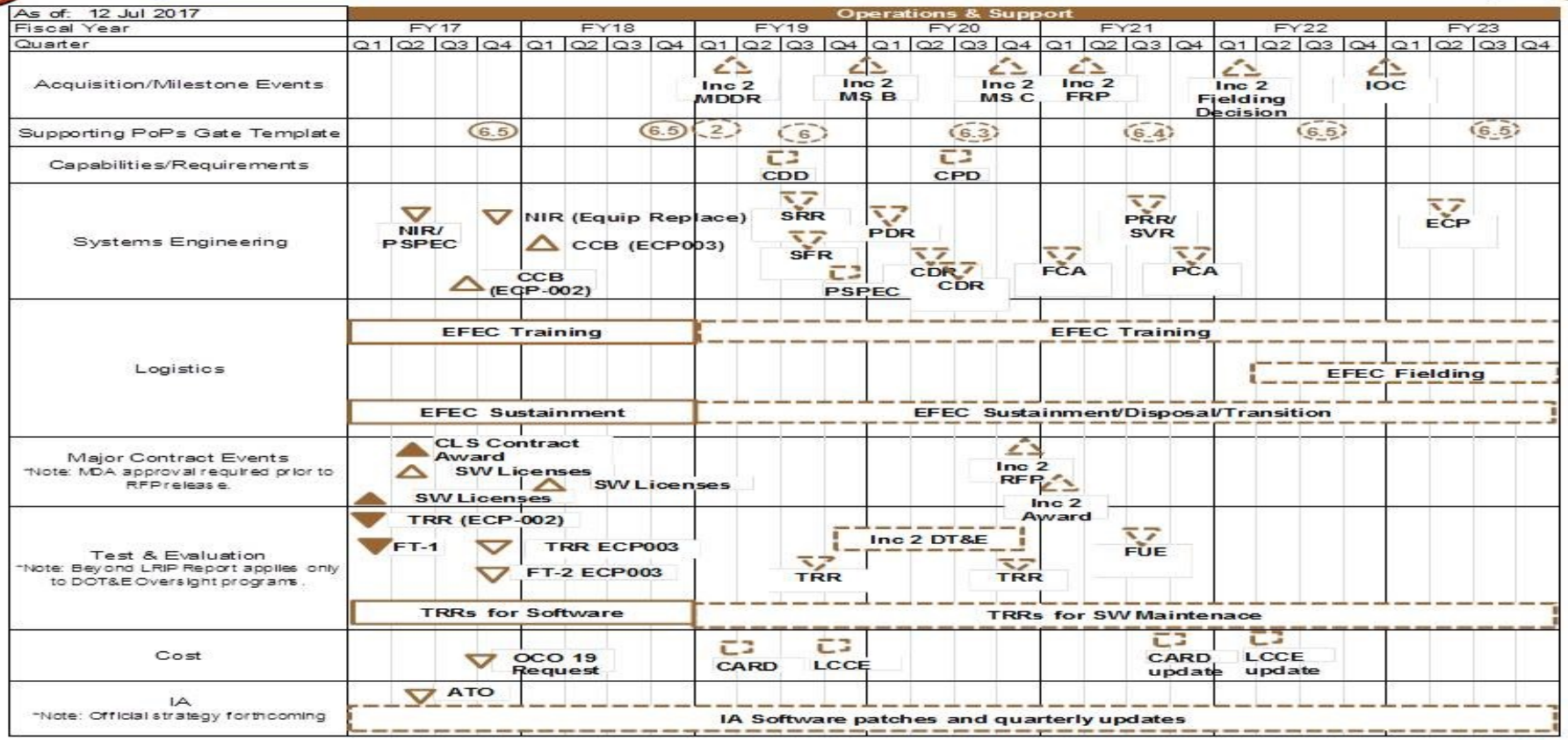


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2270				
MAGTF C2 Contract Award Software Sustainment	3	2017	3	2017
MAGTF C2 SIT 1	1	2018	1	2018
MAGTF C2 TSOA 4.0.5	2	2018	2	2018
MAGTF C2 SIT 2	4	2018	4	2018
MAGTF C2 TSOA Major	1	2019	1	2019
MAGTF C2 TSOA Minor	2	2019	2	2019
MAGTF C2 PDR	3	2019	3	2019
MAGTF C2 APP	4	2019	4	2019
MAGTF C2 TRR	4	2019	4	2019
JBC-P FoS Platform Fielding - MTVR, LVSR, AAV	2	2018	2	2019
JBC-P FoS TOC Kit Refresh Fielding	3	2018	3	2019
JBC-P FoS Platform Fielding - LAV	1	2019	4	2019
JBC-P FoS Platform Fielding - JLTV, ACV	3	2019	4	2023
H2C2 DT SW	2	2018	2	2018
H2C2 DT HW	3	2018	3	2018
H2C2 MS C	4	2019	4	2019
IDS-MC Increment 1 Fielding Decision	1	2017	1	2017
IDS-MC Initial Operational Capability (IOC)	2	2017	2	2017
IDS-MC Tech Refresh Development	2	2018	2	2019
IDS-MC MS B	3	2018	3	2018
IDS-MC MS C	4	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2270 / *Exp Indirect Fire Gen Supt Wpn Sys*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
IDS-MC FDD	3	2020	3	2020
EFEC Inc 2 MDDR	1	2019	1	2019
EFEC TRR	3	2019	3	2019
EFEC Inc 2 MS B	4	2019	4	2019
EFEC MS C	4	2020	4	2020
EFEC FRP	1	2021	1	2021
EFEC Fielding Decision	1	2022	1	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2273 / *Air Ops Cmd & Control (C2) 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
2273: *Air Ops Cmd & Control (C2) Sys*	424.214	13.167	14.630	8.467	-	8.467	7.202	6.858	7.003	7.185	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, Combat Operations Center (COC) has be realigned from Project C2273 to C2275, Radio Systems, to support US Marine Corps (USMC) Program Management Office (PMO) reorganization to improve support of USMC Operating Forces (OPFOR).

A. Mission Description and Budget Item Justification

Combat Operations Center (COC) - AN/TSQ-239 (V)1-4 are a deployable, self-contained, modular, centralized and scalable facility ((V)1 MEF-size, (V)2 MSC/Div-size, (V)3 Regiment-size, (V)4 Battalion-size) which provides digital, shared Command and Control/Situational Awareness functionalities to enhance the Common Operational Picture (COP) for the Command Element, Ground Command Element, Air Combat Element, and Logistics Combat Element. It is a commercial-off-the-shelf integrated hardware solution using unit provided radios, re-hosted tactical data systems, and available Marine Corps prime movers to transport the system. Funds support testing and Information Assurance (IA) certification activities, integration of emerging technology, and On The Move (OTM) capabilities. COC transitions from Project C2273 to Project C2275 in FY19.

Composite Tracking Network (CTN) - Provides a ground based sensor netting solution that significantly improves situational awareness by correlating sensor measurement data (target position, speed, heading, Identification Friend and Foe (IFF), etc.) from local and remote radars in the Cooperative Engagement Capability (CEC) network. This data is then provided to the warfighter in the form of composite, real-time, air surveillance tracks to the Marine Air Command and Control node and is integral in providing an accurate representation of the airspace to reduce ground to air and air to air fratricide, facilitate more effective integration of air and surface fires, extend the air defensive capability of the Naval force in the littorals and enable integrated fire control (IFC) for the Marine Corps.

Remote Video Viewing Terminal (RVVT) - Consists of Commercial Off-The-Shelf (COTS) Video Down-Link (VDL) products such as the VideoScout Mobile Configuration 2 (VS-MC/2), VideoScout Mobile Configuration 3 (VS-MC/3), Man Portable Video Down-Link (MPVDL) that allow for the viewing and exploitation of Full Motion Video (FMV) from Intelligence, Surveillance and Reconnaissance (ISR) assets. VDL systems are mission critical for coordination of direct and indirect fires and the prevention of fratricide. These systems provide the warfighter with video and metadata from all USMC manned and unmanned aircraft to include but not limited to Raven B, Puma, Micro-UAS, Shadow, Predator, Fire Scout, and Litening Pod on P-3, AV8-B, and F/A-18. Data is displayed to Forward Observers (FO), Joint Fires Observers (JFO), Joint Terminal Attack Coordinators (JTAC), and Forward Air Controller (FAC).

Theater Battle Management Core System (TBMCS) - Joint mandated Air War planning tool for the generation, dissemination and execution of the Air Tasking Order (ATO). TBMCS is an Air Force led program, which provides the automated tools necessary to manage tactical air operations, execute area air defense and airspace management in the tactical area of operation, and coordinate operations with components of other military services. TBMCS is located at the Tactical Air Command Center (TACC), with remotes located throughout the area of operation. It is scalable, allowing for joint, coalition and service specific operations. It is an evolutionary

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

acquisition program. USMC has initiated funding in support of Air Force led Command and Control Air Operation System - Command and Control Information Services (C2AOS-C2IS) requirements. The decrease of $0.796M from FY 2018 to FY 2019 is largely due to the completion of C2AOS-C2IS tactical map software development in FY 2018. USMC is funding participation in the Air Force's test events to ensure USMC requirements are being implemented as Command and Control Air Operation System - Command and Control Information Services (C2AOS-C2IS) will be the replacement for Air Force TBMCS. C2AOS-C2IS - is an ACAT III, post Milestone B, Air Force led program. C2AOS-C2IS will bring increased capability to the Operating Forces with a modern services based infrastructure and modern applications. C2AOS-C2IS provides additional tools to conduct: Situational Awareness and Assessment; Airspace De-confliction; Execution Management and Re-planning; Close Air Support; Targeting/Weaponeering; and Time Critical Targeting. Software development and sustainment keeps Marine Aviation relevant and operational in a joint theater. USMC risk reduction efforts include conducting Critical Analysis/Map Abstraction Layer implementation and assessment and Risk Reduction Testing.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: COC: Continued Capability Solution	1.077	4.446	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue testing and software integration efforts needed to align with other C2 systems. -Complete market research for hardware refresh. -Increase of $2.526 from FY17 to FY18 for testing and software integration efforts to address end-of-life obsolescence issues and alignment with other C2 systems. ***FY 2019 Base Plans:*** -In FY19 COC funding is realigned to project 2275. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, Combat Operations Center (COC) has be realigned from Project C2273 to C2275, Radio Systems, to support US Marine Corps (USMC) Program Management Office (PMO) reorganization to improve support of USMC Operating Forces (OPFOR).					
Title: COC: Management Services	2.448	0.917	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue engineering support for system optimization and system enhancements. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-In FY19 COC funding is realigned to project 2275. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, Combat Operations Center (COC) has be realigned from Project C2273 to C2275, Radio Systems, to support US Marine Corps (USMC) Program Management Office (PMO) reorganization to improve support of USMC Operating Forces (OPFOR).					
Title: Composite Tracking Network (CTN): Support and Management Services	0.746	0.262	0.208	0.000	0.208
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue systems engineering efforts and updates to the software baseline. - Continue travel, engineering support, and test support. ***FY 2019 Base Plans:*** - Continue systems engineering efforts and updates to the software baseline. - Continue travel, engineering support, and test support. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Composite Tracking Network (CTN): Engineering Development	2.928	1.117	1.215	0.000	1.215
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue software certification to maintain interoperability with Cooperative Engagement Capability (CEC) Network to include associated engineering support. - Continue Independent Verification and Validation support as well as Information Assurance (IA) tactical side hardening regression testing. ***FY 2019 Base Plans:*** - Continue software certification to maintain interoperability with Cooperative Engagement Capability (CEC) Network to include associated engineering support.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Provide engineering support for CTN Software Development and Integration, CTN System Verification Testing, and Joint testing and certification efforts required to support the G/ATOR Mode V and CTN interface. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The CTN Engineering Development increase of $0.098M from FY 2018 to FY 2019 relates to engineering support required for CTN Software Development and Integration, CTN System Verification Testing, and Joint testing and certification efforts required to support the G/ATOR Mode V and CTN interface.					
Title: RVVT: Preparation ***Articles:*** ***FY 2018 Plans:*** - Continue the development and integration of software to ensure full motion video compatibility across the spectrum of weapons and targeting platforms that receive and transmit the data. ***FY 2019 Base Plans:*** - Continue the development and integration of software to ensure full motion video compatibility across the spectrum of weapons and targeting platforms that receive and transmit the data. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.	0.157 -	1.158 -	1.141 -	0.000 -	1.141 -
Title: Composite Tracking Network (CTN): Developmental Testing and Cyber Security ***Articles:*** ***FY 2018 Plans:*** - Continue integration and interoperability developmental testing with CAC2S, G/ATOR, and the TPS-59 Mode V. - Continue Information Assurance (IA) developmental activities. - Conduct CAB-E Formal Qualification Test (FQT) and Field User Evaluation (FUE) test events. - Initiate CTN Independent Verification and Validation (IV&V) testing to include associated engineering support.	1.962 -	0.764 -	0.733 -	0.000 -	0.733 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Conduct developmental tests in support of Common Array Block-Expeditionary (CAB-E) to include associated engineering support. ***FY 2019 Base Plans:*** - Continue integration and interoperability developmental testing with CAC2S, G/ATOR, and the TPS-59 Mode V. - Continue Information Assurance (IA) developmental activities. - Continue CTN Independent Verification and Validation (IV&V) testing to include associated engineering support. - Initiate G/ATOR Mode V Integration and Testing beginning 2Q FY 2019. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: C2AOS-C2IS Product Development ***Articles:*** ***FY 2018 Plans:*** - Develop and assess tactical map software to interface with C2AOS-C2IS. ***FY 2019 Base Plans:*** Decrease of $0.445M from FY 2018 to FY 2019 due to the completion of tactical map software development with C2AOS-C2IS in FY 2018. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.445M from FY 2018 to FY 2019 due to the completion of tactical map software development with C2AOS-C2IS in FY 2018.	0.000 -	0.445 -	0.000 -	0.000 -	0.000 -
Title: C2AOS-C2IS Support ***Articles:*** ***FY 2018 Plans:***	0.000 -	0.324 -	0.314 -	0.000 -	0.314 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate critical analysis efforts with C2AOS-C2IS applications in support of risk reduction testing, developmental test, and operational test. ***FY 2019 Base Plans:*** - Continue critical analysis efforts with C2AOS-C2IS applications in support of Air Force led multiservice operational test and evaluation. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: C2AOS-C2IS Test and Evaluation ***Articles:*** ***FY 2018 Plans:*** - Initiate information assurance testing on developmental software to determine the cyber security posture and conduct risk reduction testing to identify potential vulnerabilities. - Initiate USMC support of Air Force C2AOS-C2IS Joint Partner testing. - Conduct Regression Testing of tactical map software interface. - Initiate test support efforts to Air Force led Integrated Developmental Test, Integrated Developmental Test Regression Test and Operational Tests. ***FY 2019 Base Plans:*** - Participate in Air Force led Multiservice Operational Test and Evaluation (MOT&E) test event to ensure USMC requirements are addressed. - Continue information assurance testing on developmental software to determine the cyber security posture and conduct risk reduction testing to identify potential vulnerabilities. - Continue USMC support of Air Force C2AOS-C2IS Joint Partner testing. ***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 -	1.674 -	1.529 -	0.000 -	1.529 -
Title: C2AOS-C2IS Management Services	0.000	0.546	0.396	0.000	0.396

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

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: - Initiate management support efforts to participate in the development of C2AOS-C2IS and Air Force led test events to ensure USMC requirements are addressed. ***FY 2019 Base Plans:*** Decrease of $0.150M from FY 2018 to FY 2019 due to reduction of required program support. - Continue management support efforts to participate in the development of C2AOS-C2IS and Air Force led test events to ensure USMC requirements are addressed. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: TBMCS - Software Development Support	3.849	2.977	2.931	0.000	2.931
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue test and evaluation support for TBMCS upgrades for Joint Interoperability. -Continue development test and evaluation support of USMC developed software releases which support the software baseline for Cyber Security upgrades as well as conduct annual Cyber Security Accreditation. ***FY 2019 Base Plans:*** -Continue test and evaluation support for TBMCS upgrades for Joint Interoperability. -Continue development test and evaluation support of USMC developed software releases which support the software baseline for Cyber Security upgrades as well as conduct annual Cyber Security Accreditation. ***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	13.167	14.630	8.467	0.000	8.467

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) 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
• PMC/4640CT: *CTN*	1.515	5.360	5.455	-	5.455	4.459	0.000	0.000	0.000	0.000	68.610
• PMC/4640CU: *MACCS*	0.434	2.662	0.050	-	0.050	0.051	0.052	0.053	0.054	0.000	96.809
• PMC/4640DX: *TBMCS*	3.720	1.902	1.477	-	1.477	1.477	1.304	1.333	1.374	Continuing	Continuing
• PMC/464023: *RVVT*	10.248	8.469	7.287	-	7.287	5.874	5.894	6.198	6.377	Continuing	Continuing
• PMC/463100: *COC*	2.103	10.188	5.768	-	5.768	8.083	11.733	11.979	12.226	Continuing	Continuing

Remarks

D. Acquisition Strategy

TBMCS - is an ACAT III, Air Force led program with joint interest/oversight. USMC will continue following the Air Force lead when fielding only the joint modules of TBMCS. As USMC unique requirements are identified the USMC will deviate accordingly to sufficiently sustain systems. Over the course of the FYDP, TBMCS is to separately manage the development and fielding of software and hardware engineering change proposals for Information Assurance (IA) and functionality updates to ensure daily direct support of the Air Battle Plan in joint theaters of operation. The Air Force is in the process of transitioning TBMCS to C2AOS-C2IS. C2AOS-C2IS is an ACAT III, Air Force led joint interest program and identified as a viable replacement of TBMCS. C2AOS-C2IS is currently in development by the Air Force with an anticipated Full Deployment Decision (FDD) 4th quarter FY 2019. The USMC C2AOS-C2IS strategy is to support and participate in the Air Force led FY 2019 joint test events, implementation of a tactical map interface, and conduct risk reduction testing in order to ensure the USMC remains aligned with the Air Force mandated testing and fielding schedules.

CTN - The USMC's CTN acquisition strategy is to participate in the USN's Cooperative Engagement Capability (CEC) program procurement and testing, making necessary modifications to support the Marine Corps' requirement. The next major efforts are the development and procurement of the Common Array Block-Expeditionary (CAB-E) Antenna to replace the Composite Solid State Antenna (CSSA), which will become obsolete in FY 2018, and completion of interfaces with Ground/Air Task Oriented Radar (G/ATOR) and CAC2S.

RVVT - The RVVT acquisition strategy is to continually improve the Video Down-Link (VDL) products by enhancing the encryption, range, and reducing the power and weight requirements through competition. Efforts to integrate Full Motion Video (FMV) to support Joint Fires Observers (JFOs) and Joint Terminal Attack Controllers (JTACs) began in FY 2017.

COC - The COC AN/TSQ-239 (V)1-4 is the foundation of USMC C2, meeting near term communications and network requirements across the OpFor. There is a continuing developmental effort to evolve the COC into a fully integrated MAGTF C2 capability. FY 2017 and FY 2018 continues to maintain industry standard and interoperability with disparate C2 systems across the joint forces.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2273 / *Air Ops Cmd & Control (C2) 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
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	256.411	0.000		0.000		0.000		-		0.000	0.000	256.411	-
CTN Engineering Devlopment	C/CPFF	NAVSEA PEO IWS : Washington, DC	19.152	2.928	May 2017	1.117	Feb 2018	1.215	Feb 2019	-		1.215	Continuing	Continuing	Continuing
COC	WR	NSWC : Dahlgren,VA	5.684	0.307	Feb 2017	1.240	Feb 2018	0.000		-		0.000	0.000	7.231	-
COC	C/CPIF	NSWC : Dahlgren, VA	0.130	0.108	Apr 2017	1.706	Feb 2018	0.000		-		0.000	0.000	1.944	-
COC	WR	SSC-LANT : Charleston, SC	1.279	0.379	Feb 2017	1.315	Feb 2018	0.000		-		0.000	0.000	2.973	-
COC	C/CPIF	SSC-Lant2 : Charleston, SC	0.000	0.283	Jun 2017	0.185	Jan 2018	0.000		-		0.000	0.000	0.468	-
RVVT	MIPR	ARDEC : Picatinny, NJ	1.334	0.000		0.000		0.000		-		0.000	0.000	1.334	-
C2AOS-C2IS Tactical Map Software Development	SS/FFP	Raytheon Solypsis : Fulton, MD	0.000	0.000		0.445	Dec 2017	0.000		-		0.000	0.000	0.445	-
RVVT	MIPR	AMRDEC : Huntsville, AL	1.008	0.157	Mar 2017	1.158	Mar 2018	1.141	Mar 2019	-		1.141	0.000	3.464	-
		Subtotal	284.998	4.162		7.166		2.356		-		2.356	Continuing	Continuing	N/A

Remarks

Reduction of $4.810M reflects movement of COC to RDTEN PRJ C2275.

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	47.558	0.000		0.000		0.000		-		0.000	0.000	47.558	-
CTN Engineering Support	WR	NSWC : Dahlgren, VA	5.588	0.682	Jan 2017	0.215	Jan 2018	0.200	Jan 2019	-		0.200	Continuing	Continuing	Continuing
CTN Engineering Support	WR	NSWC : PHD, CA	0.569	0.040	Feb 2017	0.033	Feb 2018	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 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2273 / *Air Ops Cmd & Control (C2) Sys*	

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
CTN Engineering Support	Various	Travel-TAD : Not Specified	1.100	0.024	Sep 2017	0.014	Sep 2018	0.008	Sep 2019	-		0.008	Continuing	Continuing	Continuing
C2AOS-C2IS Engineering Support	WR	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		0.324	Dec 2017	0.314	Dec 2018	-		0.314	0.000	0.638	-
		Subtotal	54.815	0.746		0.586		0.522		-		0.522	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
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	40.227	0.000		0.000		0.000		-		0.000	0.000	40.227	-
TBMCS Software Development	C/FFP	Lockheed Martin : Colorado Springs, CO	9.528	3.849	Mar 2017	2.977	Mar 2018	2.931	Mar 2019	-		2.931	Continuing	Continuing	Continuing
CTN Developmental Testing	WR	NSWC Corona : Corona, CA	1.557	0.628	Feb 2017	0.325	Feb 2018	0.312	Feb 2019	-		0.312	0.000	2.822	-
CTN Engineering/Cyber Security Development	C/CPFF	NAVSEA PEO IWS : Washington DC	0.333	1.334	Jan 2017	0.439	Jan 2018	0.421	Jan 2019	-		0.421	0.000	2.527	-
C2AOS-C2IS Operational Test Support	WR	MCOTEA : Quantico, VA	0.000	0.000		0.939	Dec 2017	0.788	Dec 2018	-		0.788	0.000	1.727	-
C2AOS-C2IS Developmental Test Support	C/FFP	TBD : TBD	0.000	0.000		0.315	Jan 2018	0.327	Jan 2019	-		0.327	0.000	0.642	-
C2AOS-C2IS Cyber Security Training	MIPR	NSWC Dahlgren : Dahlgren, VA	0.000	0.000		0.420	Dec 2017	0.414	Dec 2018	-		0.414	0.000	0.834	-
		Subtotal	51.645	5.811		5.415		5.193		-		5.193	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

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 Years Cumulative Funding	Various	VARIOUS : VARIOUS	28.671	0.000		0.000		0.000		-		0.000	0.000	28.671	-
COC Engineering Support	FFRDC	U.S. Army, MITRE : Stafford, VA	4.085	2.448	Mar 2017	0.917	Mar 2018	0.000		-		0.000	0.000	7.450	-
C2AOS-C2IS Program Support	C/FFP	TBD : TBD	0.000	0.000		0.546	Apr 2018	0.396	Apr 2019	-		0.396	0.000	0.942	-
		Subtotal	32.756	2.448		1.463		0.396		-		0.396	0.000	37.063	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	424.214	13.167		14.630		8.467		-		8.467	Continuing	Continuing	N/A

Remarks

The total decrease of $6.156M from FY 2018 to FY 2019 is primarily due to the realignment of COC funding to project 2275. Realignment of efforts to new BLIs in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

TBMCS Program Schedule

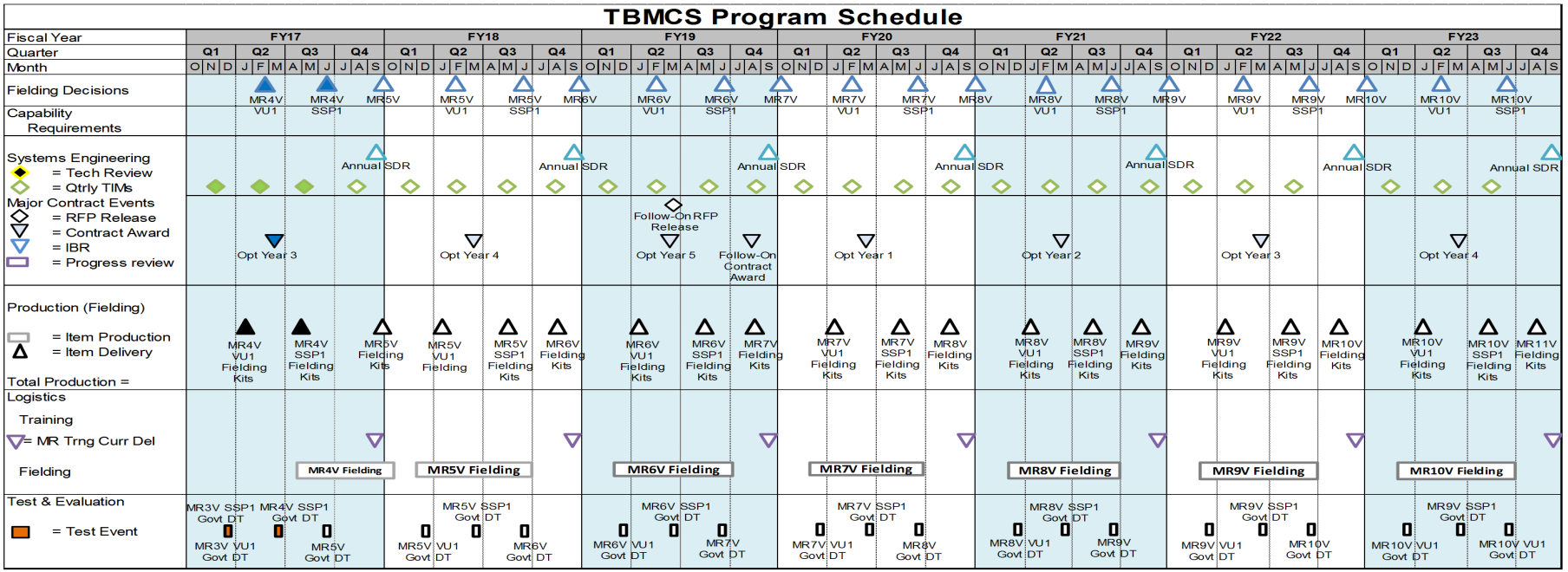


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

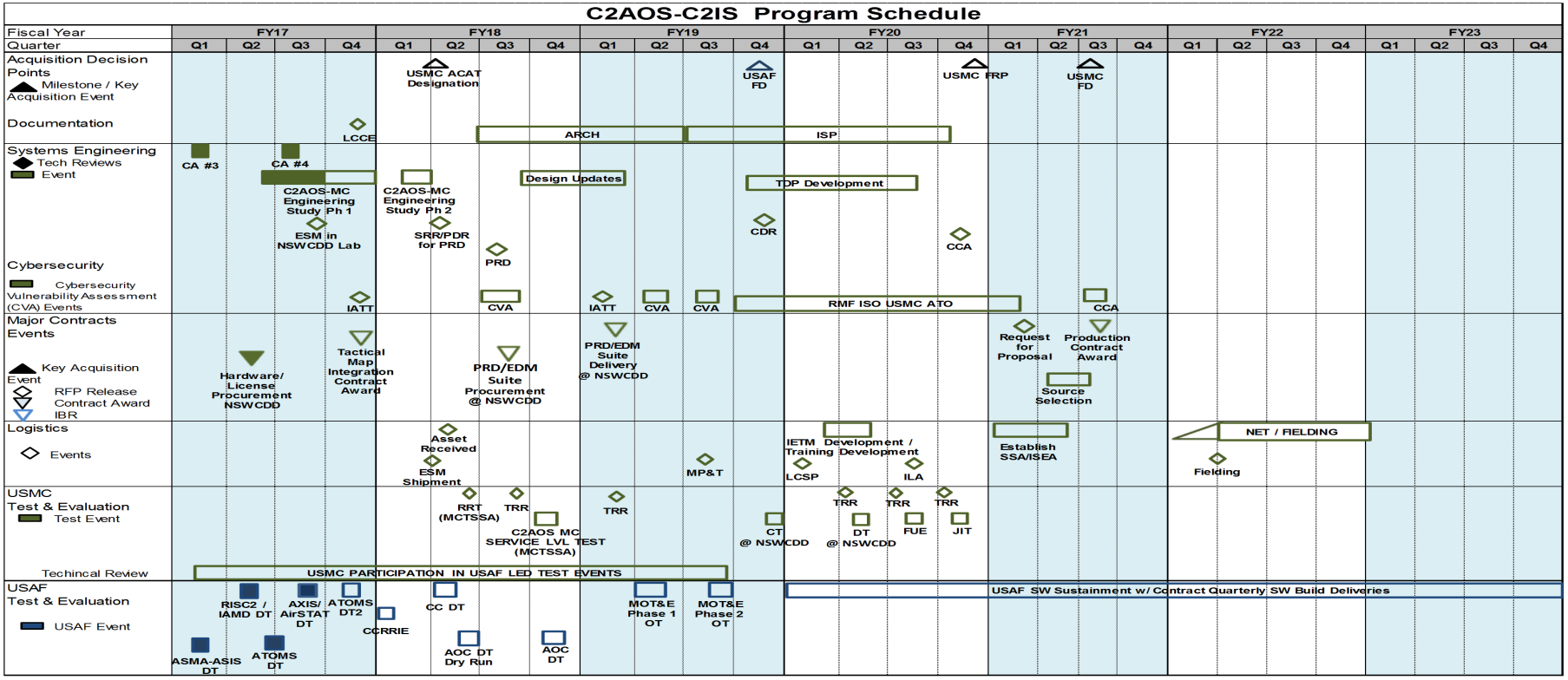


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

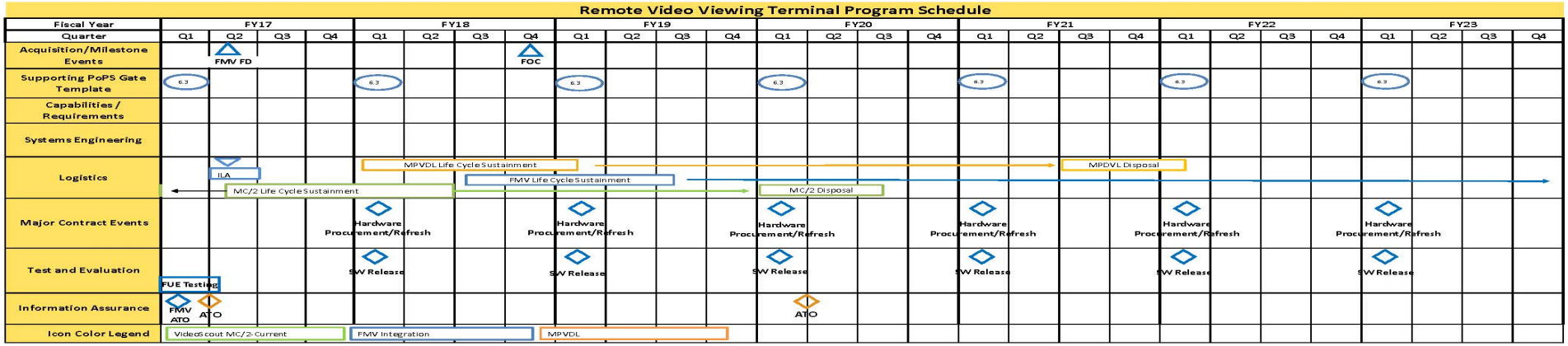


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

Composite Tracking Network Program Schedule

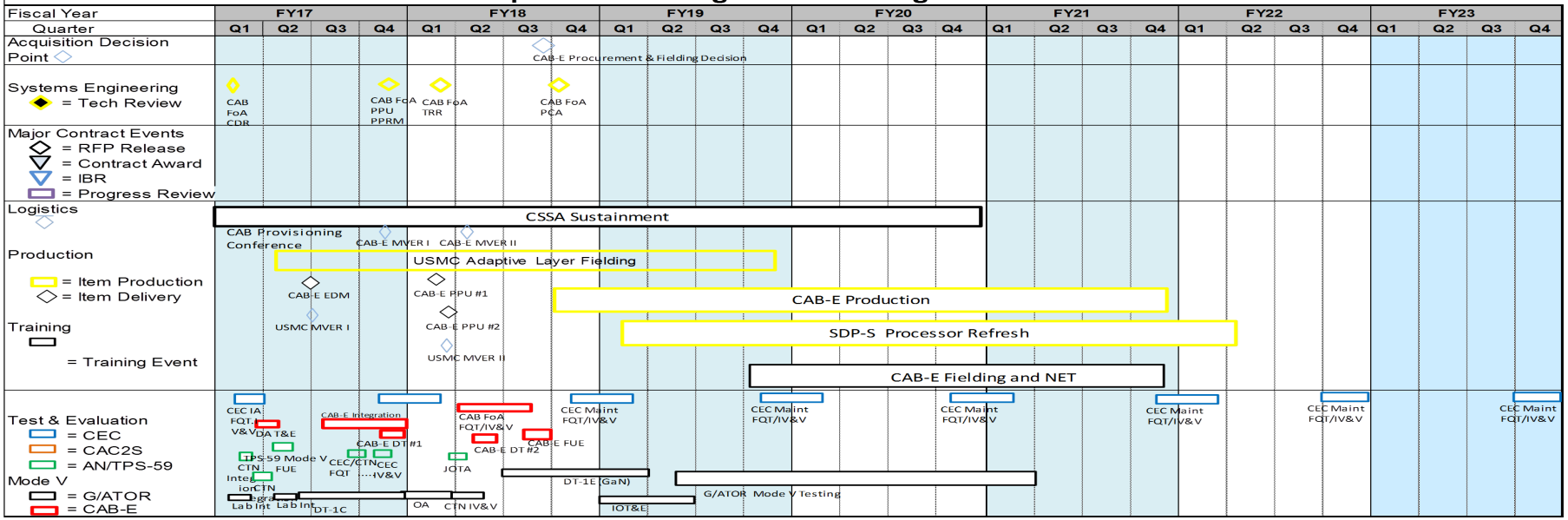


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2273				
TBMCS MR5V Government Developmental Test	1	2018	1	2018
TBMCS Option Year 4 Software Development Award	2	2018	2	2018
TBMCS FY18 System Design Review	4	2018	4	2018
TBMCS MR6V Fielding Decision	4	2018	4	2018
TBMCS MR6V Fielding Kits (PMC 4640)	4	2018	2	2019
TBMCS MR6V Government Developmental Test	1	2019	1	2019
TBMCS Option Year 5 Software Development Award	2	2019	2	2019
TBMCS MR7V Fielding Kits (PMC 4640)	4	2019	2	2020
TBMCS FY19 System Design Review	4	2019	4	2019
CTN - G/ATOR DT-1C and Operational Assessment	2	2017	1	2018
CTN - CAB-E Developmental Test #1	1	2018	1	2018
CTN - CAB-E Developmental Test #2	2	2018	2	2018
CTN - CAB-E Procurement and Fielding Decision (PMC 4640)	3	2018	3	2018
CTN - CAB-E Production	4	2018	4	2021
CTN - CAB-E Field User Evaluation (FUE)	3	2018	3	2018
CTN - G/ATOR DT-1E and IOT&E	3	2018	2	2019
CTN - CAB-E FoA Qualification/FQT/IV&V	2	2018	3	2018
CTN - G/ATOR Mode V Integration and Testing	2	2019	2	2021
CTN - CAB-E New Equipment Training and Fielding	4	2019	1	2023
RVVT Full Operational Capability (FOC)	4	2018	4	2018
C2AOS-C2IS Regression Testing of Tactical Map Interface	2	2018	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2273 / *Air Ops Cmd & Control (C2) Sys*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
C2AOS-C2IS Technical Readiness Review	1	2019	1	2019
C2AOS-C2IS USAF MOT&E Phase 1	2	2019	2	2019
C2AOS-C2IS Cyber Security Vulnerability Assessment	2	2019	3	2019
C2AOS-C2IS USAF MOT&E Phase 2	3	2019	3	2019
C2AOS-C2IS Compliance Testing	4	2019	4	2019
C2AOS-C2IS - USAF Full Deployment Decision (FDD)	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2274 / *Command & Control Warfare 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
2274: *Command & Control Warfare Sys*	41.483	5.731	8.129	11.992	-	11.992	6.375	7.122	7.258	7.416	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

NOTE: The increase of $3.863M from FY2018 to FY2019 supports Multi- Function Electronic Warfare (MFEW) development and additional loadset development for advanced threats.

A. Mission Description and Budget Item Justification

COUNTER RADIO-CONTROLLED IMPROVISED EXPLOSIVE DEVICE (RCIED) ELECTRONIC WARFARE (USMC CREW) SYSTEMS are vehicle mounted and dismounted modular programmable multi-band radio frequency jammers designed to deny enemy use of selected portions of the radio frequency spectrum in the vicinity of the jammer to counter the RCIED threat. The mounted and dismounted systems provide Marines in vehicle convoys and on foot with the necessary protection from the continued and evolving threat of deadly RCIEDs. Legacy CREW systems are currently deployed to meet threats in the multiple theaters of operation and fielded to selected Marine Expeditionary Units (MEU)/Marine Expeditionary Forces (MEF) in support of worldwide deployment. To continue to support the various worldwide missions, each CREW unit receives customized programming (loadsets) to counter that area's RCIED threats. The testing, programming development, and product improvement research are funded with the CREW's RDTE,N funding and prioritized to meet the growing demand for all deployed Marine units.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: *USMC CREW - Product Development	1.132	1.416	7.608	0.000	7.608
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue the development of software waveform loadsets for USMC CREW Systems including mounted and dismounted system's waveforms used specifically to counter Improvised Explosive Device (IED) threat worldwide. -Continue software waveform loadsets for Universal Test Sets (UTS) across multiple deployment theaters. -Continue testing and technique development of additional software threatloads to overcome capability issues impacting dismounted Marines and each vehicle platform type. -Continue efforts to update the CREW CVRJ(V)2 (CREW Mounted Upgrade) to deliver a system capable of performing against the product specification.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

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 development of software waveform loadsets for USMC CREW Systems including mounted and dismounted system's waveforms used specifically to counter Improvised Explosive Device (IED) threat worldwide. Increase loadset development of advanced threats. -Continue development of additional software improvements to overcome select CREW systems capability issues not limited by technology obsolescence. -Continue to develop vehicle installation kits for CREW mounted systems in order to support the integration and installation of the upgrade kits into Marine Corps vehicle platform. -Continue system level verification testing on the Modi II system to counter RCIED threats. -Initiate additional testing for CREW mounted system solution. -Initiate Market Research and Analysis, software development and hardware design and development for Multi-Function Electronic Warfare (MFEW) capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase of $6.192M from FY18 to FY19 supports Multi- Function Electronic Warfare (MFEW) development and additional loadset development for advanced threats.					
Title: *USMC CREW - Support	0.150	0.722	0.159	0.000	0.159
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to conduct systems engineering support for the CREW family of systems and integration support required for the mounted CREW into Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) mission profiles by developing vehicle installation kits for these mounted units. -Continue system support for CVRJ (V)2, Thor III, Modi II, and Universal Test Sets by analyzing CREW performance impacts resulting from compatibility and environmental risk impacts. ***FY 2019 Base Plans:*** -Continue to conduct systems engineering support at a reduced level for the CREW family of systems and integration support required for the mounted CREW into Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) mission profiles by developing vehicle installation kits for these mounted units.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Continue system support for CVRJ (V)2, Modi II, and Universal Test Sets by analyzing CREW performance impacts resulting from compatibility and environmental risk impacts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: *USMC CREW - Test and Evaluation	2.659	3.095	2.243	0.000	2.243
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue test events in support of the CVRJ (V)2, Thor III, Modi II and Universal Test Set (UTS) systems regarding its ability to defeat the RCIED threat in multiple worldwide locations. -Continue testing of the mounted and dismounted CREW production units that will be fielded for Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) use. -Continue compatibility testing against USMC and other services devices to ensure Marine Corps CREW systems maintain required performance capabilities. -Complete characterizing operational limitations regarding the CREW systems and standoff restrictions for its operation. -Complete mounted and dismounted CREW improvements testing to distinguish possible design limitations that can be improved to optimize the Marines use of the system.					
FY 2019 Base Plans: -Continue test events in support of the CVRJ (V)2 and Universal Test Set (UTS) systems regarding its ability to defeat the RCIED threat in multiple worldwide locations. -Continue testing of the mounted and dismounted CREW production units that will be fielded for Marine Expeditionary Units (MEU)/Marine Expeditionary Force (MEF) use. -Continue compatibility testing against USMC and other services devices to ensure Marine Corps CREW systems maintain required performance capabilities. -Continue mounted and dismounted CREW improvements testing to distinguish possible design limitations that can be improved to optimize the Marines use of the system. -Initiate test events for loadsets against advanced and emerging threat systems.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

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 significant change from FY 2018 to FY 2019.					
Title: *USMC CREW - Management Services	1.790	2.896	1.982	0.000	1.982
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to manage the new RCIED techniques development group and hardware engineering team to enhance loadsets upgrades to counter the evolving threat and prevent technology obsolescence for CVRJ(V)2, Thor III, Modi II and the Universal Test Set systems. Conducting system level configuration management activities for all CREW systems. ***FY 2019 Base Plans:*** -Continue to manage the new RCIED techniques development group and hardware engineering team at a reduced level to enhance loadset upgrades to counter the evolving threat and prevent technology obsolescence for CVRJ(V)2, Modi II and the Universal Test Set systems. Conducting system level configuration management activities for all CREW systems. ***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	5.731	8.129	11.992	0.000	11.992

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
• PMC/652000: *CREW*	75.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

COUNTER RADIO-CONTROLLED IMPROVISED EXPLOSIVE DEVICE (RCIED) ELECTRONIC WARFARE (USMC CREW): CREW mounted and dismounted systems provide Marines in vehicle convoys and on foot with the necessary protection from the continued and evolving threat of deadly RCIEDs in all current and future

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

operations. The program will continue to develop new counter techniques, improve capabilities, enhance software and develop upgrades to counter evolving threats and prevent technology obsolescence. Activities include waveform development, non-recurring engineering for system enhancements, capability upgrades, and the testing/government studies required to support these changes. 3100 CREW Vehicle Receiver Jammer (CVRJ)(V1) mounted systems were upgraded with an increased capability, CVRJ(V)2, and fielded to support vehicle convoys. The United States Marine Corps (USMC) intends to upgrade the CVRJ(V)2 (CREW Mounted Upgrade) to counter advance threats facing deployed units. The Thor III dismounted systems fielded to Operation Enduring Freedom (OEF) and to select Marine Expeditionary Units (MEUs), will be replaced by the Modi II systems starting in FY18. The Modi II program consists of 565 dismounted systems and was initiated as an ongoing effort to develop new techniques, improve capabilities, enhance software and develop waveform loadsets to counter evolving threats and prevent technology obsolescence for the Thor III dismounted systems. FY18 plan reflects test and evaluation for CREW development efforts to include software load-set development and capability testing of the Modi II CREW System. FY19 plan reflects test and evaluation for CREW development efforts to include software load-set development and capability testing of the CREW System and market research and development efforts for the Multi-Function Electronic Warfare, which would do both CREW and Counter Unmanned Aerial Systems (C-UAS).

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare 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
USMC CREW	WR	NSWC CD 1 : CRANE, IN	0.000	0.000		0.000		1.670	Nov 2018	-		1.670	0.000	1.670	-
USMC CREW	WR	NSWC CD 2 : CRANE, IN	4.992	1.132	Jun 2017	1.416	Feb 2018	4.789	Feb 2019	-		4.789	Continuing	Continuing	Continuing
USMC CREW	C/CPIF	NSWC CD : CRANE, IN	0.000	0.000		0.000		1.149	Feb 2019	-		1.149	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	VARIOUS : VARIOUS	7.549	0.000		0.000		0.000		-		0.000	0.000	7.549	-
		Subtotal	12.541	1.132		1.416		7.608		-		7.608	Continuing	Continuing	N/A

Remarks

USMC CREW NSWC CRANE (Crane, IN) FY17 - FY19: Design, develop and contract engineering changes to the CREW systems and to develop software Threat Load (TL) loadsets for all CREW systems to continue to counter the evolving RCIED Threats.

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
USMC CREW	WR	SSC-A : CHARLESTON, SC	1.106	0.150	Jun 2017	0.155	Feb 2018	0.159	Feb 2019	-		0.159	Continuing	Continuing	Continuing
USMC CREW	WR	NSWC DD : DAHLGREN, VA	1.361	0.000		0.567	Feb 2018	0.000		-		0.000	0.000	1.928	-
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	3.800	0.000		0.000		0.000		-		0.000	0.000	3.800	-
		Subtotal	6.267	0.150		0.722		0.159		-		0.159	Continuing	Continuing	N/A

Remarks

USMC CREW SSC-Atlantic FY17 - FY19: System Engineering and validation and verification.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2274 / *Command & Control Warfare 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
USMC CREW	MIPR	YPG : YUMA, AZ	8.802	0.000		2.914	Apr 2018	1.236	Apr 2019	-		1.236	Continuing	Continuing	Continuing
USMC CREW	MIPR	SOCOM : TAMPA, FL	0.000	0.000		0.000		0.200	Jun 2019	-		0.200	Continuing	Continuing	Continuing
USMC CREW	WR	NSWC DD : DAHLGREN, VA	0.195	0.000		0.120	Apr 2018	0.000	Apr 2019	-		0.000	Continuing	Continuing	Continuing
USMC CREW	WR	NSWC CD : CRANE, IN	0.057	2.278	Jul 2017	0.061	Feb 2018	0.807	Feb 2019	-		0.807	Continuing	Continuing	Continuing
USMC CREW	MIPR	DLA : PHILADELPHIA, PA	0.327	0.381	Aug 2017	0.000		0.000	Aug 2019	-		0.000	Continuing	Continuing	Continuing
USMC CREW	C/FFP	NSWC DD : DAHLGREN, VA2	0.000	0.000		0.000		0.000	Apr 2019	-		0.000	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	VARIOUS : VARIOUS	3.444	0.000		0.000		0.000		-		0.000	0.000	3.444	-
		Subtotal	12.825	2.659		3.095		2.243		-		2.243	Continuing	Continuing	N/A

Remarks

USMC CREW YPG (Yuma Proving Grounds, AZ) FY17 - FY19: Provide test ranges and results analysis for all CREW systems.
USMC CREW NSWC DD FY17 and FY19: Provide test support and reports.
USMC CREW NSWC CD FY17 - FY19: Provide test assets and 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
USMC CREW	WR	NSWC CD : CRANE, IN	6.497	1.489	Jan 2017	2.629	Jan 2018	1.580	Jan 2019	-		1.580	Continuing	Continuing	Continuing
USMC CREW	C/CPFF	NSWC DD : DAHLGREN, VA	1.751	0.301	Jul 2017	0.267	Jan 2018	0.402	Jan 2019	-		0.402	Continuing	Continuing	Continuing
Prior Years Cumulative Funds	Various	VARIOUS : VARIOUS	1.602	0.000		0.000		0.000		-		0.000	0.000	1.602	-
		Subtotal	9.850	1.790		2.896		1.982		-		1.982	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2274 / *Command & Control Warfare Sys*	

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
Remarks USMC CREW NSWC CRANE FY17 - FY19: Engineering and Acquisition support. USMC CREW NSWC DD FY17 - FY19: Configuration Management (CM), Liaison Officer (LNO) and engineering 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	41.483	5.731		8.129		11.992		-		11.992	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

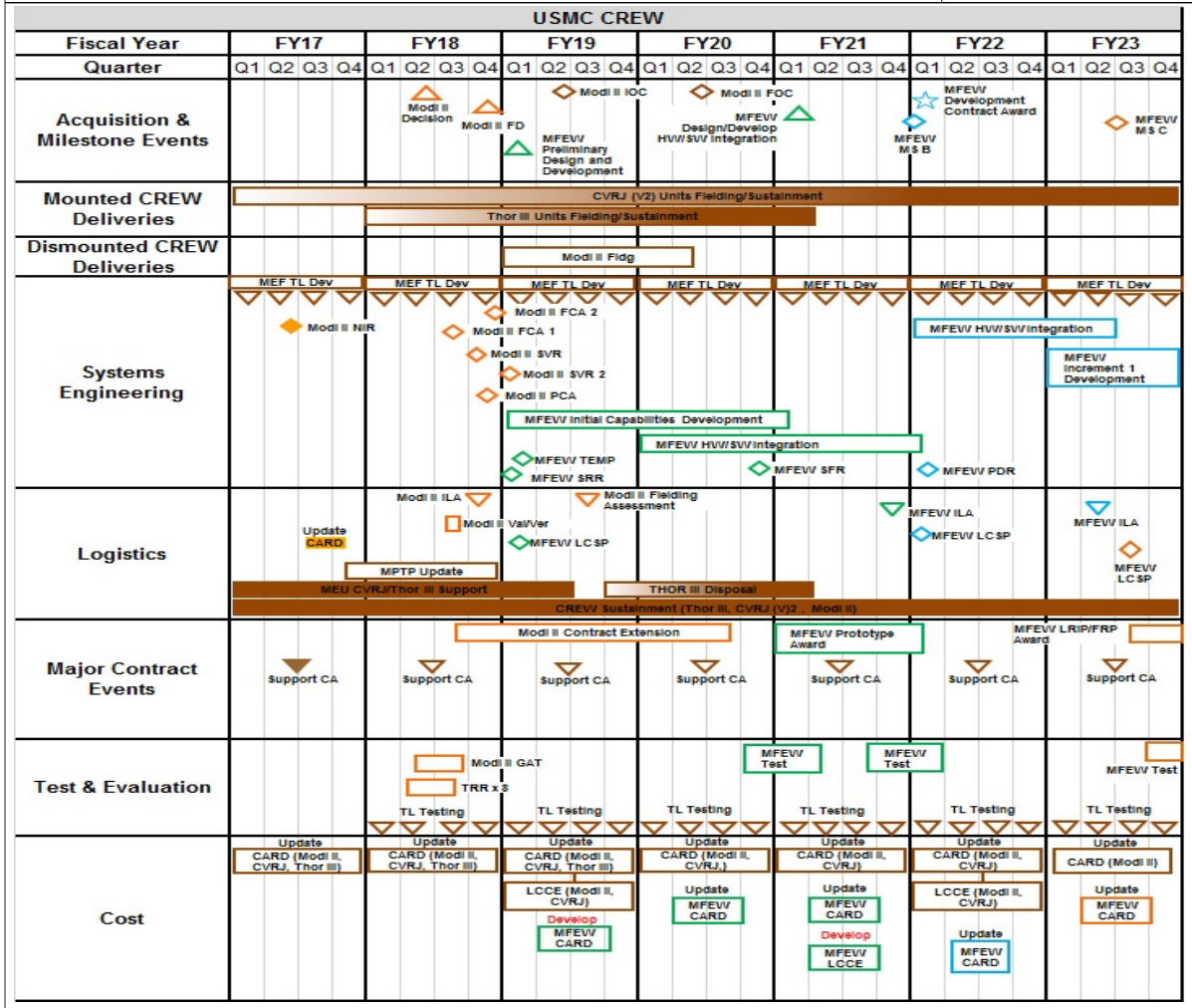


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2274 / *Command & Control Warfare Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2274				
USMC CREW Threat Load (TL) Development	1	2017	4	2023
Modi II Fielding Decision	4	2018	4	2018
Modi II Initial Operational Capability (IOC)	2	2019	2	2019
Multi- Function Electronic Warfare (MFEW) Development	1	2019	1	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2275 / *Marine Corps Tactical Radio 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
2275: *Marine Corps Tactical Radio Systems*	41.358	14.465	22.722	23.749	-	23.749	14.254	13.387	13.762	14.044	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The overall project increase of $1.027M from FY18 to FY19 supports development and testing efforts for a VSAT Medium Variant (VSAT-M) replacement system due to subcomponent obsolescence and end-of-life/end-of-sale (EOL/EOS).

Beginning in FY19, COC funding has been realigned from project 2273, Air Operations C2 Systems to this project. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

Tactical Communications Modernization (TCM): TCM supports the research, testing, and evaluation of non-developmental tactical voice and data radio systems for mounted and dismounted operations within all echelons of the Marine Air Ground Task Force. The testing will ensure the communication systems are joint networking capable and supports National Security Agency (NSA) Communications Security (COMSEC) Modernization requirements. The funding provides contracted engineering support, facility test support, and test reporting for Mobile User Objective System (MUOS, High Frequency Radio II (HFR II), Multi-Channel Man Pack (MCMP), and Multi-Channel Handheld (MCHH) radios, terminals, antennas, and Joint Enterprise Network Manager (JENM).

Networking on the Move (NOTM): NOTM provides a robust command and control (C2) capability by integrating tactical data systems with on the move satellite communications (SATCOM) for beyond line-of-sight ability that allows battlefield commanders to have uninterrupted two-way access to digital data, anywhere on the battlefield. NOTM provides Marine Air-Ground Task Force (MAGTF) commanders and staffs with full Common Operational Picture (COP) access, virtually unlimited situational awareness and a powerful ability to issue digital orders (fires, maneuver, planning) to GCE, ACE and LCE units at all echelons while on-the-move or at-the-halt. NOTM also provides Marine units the capability to link with and extend Defense Information System Network (DISN) services; SIPRNet, NIPRNet, and Defense Switched Networks (DSN). Integrated full motion video (receipt and retransmission), tactical voice communications plus three options for secure wireless local area network (LAN) connectivity between staff members makes this amphibious capability a crucial asset to all elements of the MAGTF.

Very Small Aperture Terminal (VSAT): VSAT is an integrated Commercial Off-the-Shelf (COTS) satellite communications terminal with a modular architecture that supports drop and insert architecture through scalable and flexible applications. VSAT uses commercial Ku and military Ka and X frequency bands to provide beyond line-of-sight (BLOS) connectivity to support intra-MAGTF communications (NIPRNET, SIPRNET, and telephony) down to the battalion/squadron level. With the addition of the VSAT-Expeditionary (VSAT-E) the VSAT Family of Systems (FoS) now comes in four modular variants, depending on MAGTF-size and mission.

Secure Mobile Anti-Jam Reliable Tactical-Terminal (SMART-T): SMART-T is an Army led, ACAT II program. The Marine Corps SMART-T has fielded the full Authorized Acquisition Objective (AAO) of 42 terminals and 35 AN/PSQ-17 Network Planning tools and completed the Advanced Extremely High Frequency (AEHF) upgrades. Out

of warranty repair for legacy components will be executed, when necessary, using the Army National Maintenance Contract. The SMART-T program will procure and field its Terminal Operating Unit (TOU) upgrades in FY18.

Terrestrial Wideband Transmission Systems (TWTS): TWTS is a capabilities portfolio that includes Beyond Line of Sight (BLOS) system (AN/TRC-170A) and Line of Sight (LOS) systems AN/MRC-142 Family of Systems (FoS). The AN/TRC-170A is a transportable BLOS, terrestrial, self-enclosed troposcatter terminal (multichannel) capable of transmitting and receiving digital data over varying distances up to 100 miles. Next Generation Troposcatter (NGT) is a transit case solution which will replace the AN/TRC-170A. AN/MRC-142B provides ship to shore communication. AN/MRC-142C FoS provides LOS, two-way, secure voice and data communications up to 35 miles.

Combat Operations Center (COC) - AN/TSQ-239 (V)1-4 are a deployable, self-contained, modular, centralized and scalable facility ((V)1 MEF-size, (V)2 MSC/Div-size, (V)3 Regiment-size, (V)4 Battalion-size) which provides digital, shared Command and Control/Situational Awareness functionalities to enhance the Common Operational Picture (COP) for the Command Element, Ground Command Element, Air Combat Element, and Logistics Combat Element. It is a commercial-off-the-shelf integrated hardware solution using unit provided radios, re-hosted tactical data systems, and available Marine Corps prime movers to transport the system. Funds support testing and Information Assurance (IA) certification activities, integration of emerging technology, and On The Move (OTM) capabilities. COC transitions from Project C2273 to Project C2275 in FY19.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: TCM: Product Development	0.423	1.542	1.253	0.000	1.253
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate the Life Cycle Cost Estimate (LCCE) to support Multi Channel Man Pack (MCMP)Radio (formerly Multi-Band Radio Replacement (MBR R)). ***FY 2019 Base Plans:*** - Continue funding the Marine Corps fair share cost for development of the Joint Enterprise Network Manager (JENM) application required for MUOS. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $.289M from FY18 to FY19 is due to a decrease in the Marine Corps fair share cost for development of the JENM application required for MUOS combined with completion of the LCCE in FY18.					
Title: TCM: Engineering and Program Support	0.059	0.030	0.335	0.000	0.335
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

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 engineering and support efforts. ***FY 2019 Base Plans:*** - Continue engineering and support efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: TCM: Test and Evaluation Support	0.352	3.505	3.360	0.000	3.360
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to support Mobile Objective User System (MUOS) test events and evaluations. - Initiate procurement of test assets for equipment such as HFR II and other TCM Family of Systems (FoS). - Initiate test events such as software development test, road shock, shake and vibration testing and MIL-STD testing. ***FY 2019 Base Plans:*** - Continue procurement of test assets and initiate test events for TCM Family of Systems (FoS),such as Multi Channel Hand Held (MCHH) (formerly THHR Replacement on schedule). - Continue test events such as software development test, road shock, shake and vibration testing and MIL-STD testing for TCM FoS, such as HFR II and Multi Channel Man Pack (MCMP) (formerly MBR Replacement). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: TCM: Management Services	0.059	0.295	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue Engineering and Program Support for the TCM Family of Systems (FoS).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue support of FFRDC research and engineering for the replacement of HFRII and MBR II equipment. ***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: NOTM: Product Development ***Articles:*** ***FY 2018 Plans:*** - Continue Engineering Change Proposals (ECPs), technology refreshes to extend the systems life and maintain interoperability and major product improvements to complete the AAO of 140 systems. ***FY 2019 Base Plans:*** - Continue Engineering Change Proposals (ECPs), technology refreshes to extend the systems life and maintain interoperability and major product improvements to complete the AAO of 140 systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.	5.269 -	6.220 -	6.150 -	0.000 -	6.150 -
Title: NOTM: Test and Evaluation Support ***Articles:*** ***FY 2018 Plans:*** - Continue test and evaluation support and testing for NOTM-A, BMDL, NOTM Size, Weight and Power (SWaP) reduction ECPs, and NOTM ITV efforts. ***FY 2019 Base Plans:*** - Continue test and evaluation support and testing for NOTM ITV and NOTM GCV systems. ***FY 2019 OCO Plans:***	5.674 -	5.161 -	0.687 -	0.000 -	0.687 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

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 $4.474M from FY18 to FY19 results from completion of NOTM-A, BMDL, and NOTM Size, Weight and Power (SWaP) reduction ECPs.					
Title: NOTM: Management Services	0.000	0.000	0.200	0.000	0.200
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** - Initiates research efforts of servers and capability of cyber foraging, network foraging, and cloud storage. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $.200M supports initiation of research efforts of servers and capability of cyber foraging, network foraging, and cloud storage.					
Title: VSAT: Product Development	0.482	0.366	0.455	0.000	0.455
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue VSAT GUI Design and Development due to quarterly security software updates. ***FY 2019 Base Plans:*** - Continue VSAT GUI Design and Development. - Initiate development efforts for the VSAT-M Replacement system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: VSAT: Test and Evaluation	0.094	0.211	2.683	0.000	2.683
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

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 test and evaluation for system refreshes such as Master Reference Terminal (MRT) technical refresh and laptop refresh. ***FY 2019 Base Plans:*** - Procurement of VSAT-M Replacement system test asset. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $2.472M from FY2018 to FY2019 supports procurement of VSAT-M Replacement system test assets and test events.					
Title: VSAT: Engineering and Program Support	0.252	0.254	0.201	0.000	0.201
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate ECPs on modem upgrades and R&D efforts focusing on Next Generation SATCOM. ***FY 2019 Base Plans:*** - Continue ECPs on modem upgrades and R&D efforts focusing on Next Generation SATCOM. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: VSAT: Management Services	0.060	0.077	0.077	0.000	0.077
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue engineering efforts in support of analysis of requirements development. ***FY 2019 Base Plans:*** - Continue engineering efforts through a FFRDC in support of analysis of requirements development. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

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 significant change from FY 2018 to FY 2019.					
Title: SMART-T: Engineering and Program Support	0.047	0.087	0.087	0.000	0.087
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to fund ECPs and Information Assurance support efforts. ***FY 2019 Base Plans:*** - Continue to fund ECPs and Information Assurance support efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: SMART-T: Management Services	0.067	0.100	0.103	0.000	0.103
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to provide engineering analysis on potential future technical upgrades. ***FY 2019 Base Plans:*** - Continue to provide engineering analysis through a FFRDC on potential future technical upgrades. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: TWTS: Product Development	0.000	1.764	0.050	0.000	0.050
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate TWTS Manpower Training Analysis Plan (MPTA/P) and NGT Architecture Development. ***FY 2019 Base Plans:*** - Continue TWTS Manpower Training Analysis Plan (MPTA/P). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.714M from FY18 to FY19 reflects 85% completion of the TWTS Manpower Training Analysis Plan (MPTA/P) and completion of NGT Architecture Development.					
Title: TWTS: Engineering and Program Support	1.034	1.796	1.254	0.000	1.254
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to fund engineering, safety, logistics and program management support for the Next Generation Tropo (NGT) systems and TWTS Family of Systems (FoS). ***FY 2019 Base Plans:*** - Continue to fund program management support for the Next Generation Tropo (NGT) systems and TWTS Family of Systems (FoS). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $.542M from FY18 to FY19 is due to the finalization of initial engineering, safety, logistics and program management support for the Next Generation Tropo (NGT) systems and TWTS Family of Systems (FoS).					
Title: TWTS: Test and Evalution Support	0.222	0.931	1.286	0.000	1.286
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete test and evaluation plans.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate test and evaluation events such as MIL-STD testing, NGT JITC certification plan and C/X-band testing in support of Next Generation Tropo (NGT). ***FY 2019 Base Plans:*** - Continue test and evaluation events such as MIL-STD testing, NGT JITC certification plan and C/X-band testing in support of Next Generation Tropo (NGT). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $.355M from FY18 to FY19 supports continuing test and evaluation efforts; such as MIL-STD testing, NGT JITC certification plan and C/X-band testing in support of Next Generation Tropo (NGT).					
Title: TWTS: Management Services	0.371	0.383	0.458	0.000	0.458
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue engineering and program support for TWTS FoS. ***FY 2019 Base Plans:*** - Continue engineering and program support for TWTS FoS. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $.075M from FY18 to FY19 supports additional engineering efforts for NGT X Band waveband analysis.					
Title: COC: Product Development	0.000	0.000	2.572	0.000	2.572
Articles:	-	-	-	-	-
FY 2018 Plans: - Refer to Project 2273 ***FY 2019 Base Plans:*** - Continue testing and software integration efforts needed to align with other C2 systems. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

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 $2.572M is a result of COC transition from Project 2273 to Project 2275 beginning in FY19.					
Title: COC: Management Services	0.000	0.000	2.538	0.000	2.538
Articles:	-	-	-	-	-
FY 2018 Plans: - Refer to Project 2273 ***FY 2019 Base Plans:*** - Continue engineering support for system optimization and system enhancements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $2.538M from FY18 to FY19 is a result of transition from C2273 to C2275 and increased effort to support system optimization and system enhancements such as laptop display refresh and client refresh.					
Accomplishments/Planned Programs Subtotals	14.465	22.722	23.749	0.000	23.749

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/4633-1: *TCM*	38.503	17.852	204.285	-	204.285	166.164	288.704	279.992	291.116	Continuing	Continuing
• PMC/4631-2: *NOTM*	51.754	111.340	92.669	-	92.669	79.374	53.837	14.796	14.933	Continuing	Continuing
• PMC/4633-3: *VSAT*	6.589	6.658	7.567	-	7.567	4.761	3.205	3.269	3.334	Continuing	Continuing
• PMC/4633-4: *SMART-T*	0.537	0.549	0.571	-	0.571	0.593	0.605	0.617	0.629	Continuing	Continuing
• PMC/4633-5: *TWTS*	1.894	12.237	64.911	-	64.911	37.471	56.234	215.216	211.417	Continuing	Continuing
• PMC/7000-1: *SMART-T Spares*	0.201	0.205	0.207	-	0.207	0.212	0.216	0.220	0.225	Continuing	Continuing
• PMC/4631-1: *COC*	2.103	10.188	5.768	-	5.768	8.083	11.733	11.979	12.226	Continuing	Continuing
• RDT&E/C2273: *COC*	3.525	5.363	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.888

Remarks

RDTE for COC transitions from C2273 to C2275 in FY19.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

D. Acquisition Strategy

Tactical Communications Modernization (TCM): TCM will maximize the use of non-developmental radio solutions to meet the next generation of Marine Corps tactical radio requirements. The Mobile User Objective System (MUOS) effort will utilize terminal licenses and receive antennas via a bailment agreement for testing at contracted government test labs to include environmental, shock, electromagnetic compatibility and interoperability testing. High Frequency Radios II (HFR II) contracting strategy will maximize the use of non-developmental high frequency radios while promoting competition by having industry provide proposed HFR II solutions, validated by Military Standard tests with best value selection upon successful completion of tests.

Networking on the Move (NOTM): NOTM will use an evolutionary acquisition strategy that leverages Commercial-Off-The-Shelf (COTS) and Government-Off-The-Shelf (GOTS) technology to procure, sustain and meet emerging requirements. The design of the system provides for internal growth capability through an open system architecture enabling technology refresh to extend the system's life, maintain interoperability, Information Assurance (IA) compliance, and reduce costs due to Diminishing Manufacturing Sources and Material Shortages (DMSMS). It is envisioned that technology refresh will occur on the NOTM hardware and software periodically due to component obsolescence, user-driven requests for improvements, IA compliance, and mission-related requirements. Refresh will include investments to incorporate evolving capability to ensure compatibility with other systems, create lighter more efficient equipment, and keep pace with evolving software requirements. End-of-life equipment refresh is expected throughout the program's life cycle and may be managed through kit purchases, replacement through Engineering Change Proposals (ECPs), or as replacement parts as equipment is repaired.

Very Small Aperture Terminal (VSAT): The acquisition of the external antenna is a single step acquisition which is adding capability to the VSAT-L terminal. The external antenna provides a dual shot capability that replaces the LMST and Phoenix systems. The VSAT Program approach for technology refreshes and sub-component upgrades is evolutionary. This strategy is based on procuring the latest mature and supported Commercial-Off-the Shelf (COTS) technology to keep the systems technology relevant to continue to meet mission requirements. The VSAT Program will submit Engineering Change Proposals (ECPs) for technology refresh modifications due to subcomponent obsolescence. The ECP will support the latest iteration of the Original Equipment Manufacturer (OEM) COTS equipment. This is a life cycle sustainment effort that maintains common logistical elements without re-engineering for form, fit, and function whenever warranted, with continued support of formal school training curriculum for relevant VSAT FoS hardware and software functions.

Secure Mobile Anti-Jam Reliable Tactical-Terminal (SMART-T): SMART-T is an Army led, ACAT II program. The Marine Corps SMART-T has fielded the full Authorized Acquisition Objective (AAO) of 42 terminals and 35 AN/PSQ-17 Network Planning tools and completed the Advanced Extremely High Frequency (AEHF) upgrades. Out of warranty repair for legacy components will be executed, when necessary, using the Army National Maintenance Contract. The SMART-T program will procure and field its Terminal Operating Unit (TOU) upgrades in FY18.

Terrestrial Wideband Transmission Systems (TWTS): AN/TRC-170A, the current Marine Corps troposcatter capability, was initially fielded in 1992. Next Generation Troposcatter (NGT) will replace AN/TRC-170A due to the system's obsolescence and an approved NGT Joint Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities and Policy (DOTMLPF-P) Change Recommendation (DCR). The Marine Corps plans to leverage the US Army requirement and partner with their Program office.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

Combat Operations Center (COC): The COC AN/TSQ-239 (V)1-4 is the foundation of USMC Command and Control (C2), meeting near term communications and network requirements across the OpFor. There is a continuing developmental effort to evolve the COC into a fully integrated MAGTF C2 capability. FY19 continues to maintain industry standard and interoperability with disparate C2 systems across the joint forces.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2275 / *Marine Corps Tactical Radio 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
TCM JENM Development	SS/CPFF	ARL : Aberdeen, MD	1.650	0.388	Feb 2017	1.407	Feb 2018	1.118	Feb 2019	-		1.118	0.000	4.563	-
TCM FoS LCCEs	C/IDIQ	MCSC : Quantico, VA	0.000	0.035	Apr 2017	0.135	Dec 2017	0.135	Dec 2018	-		0.135	0.000	0.305	-
NOTM Development/ Enhancement	WR	SSC-LANT2 : Charleston, SC	0.000	0.000		0.000		1.200	Apr 2019	-		1.200	0.000	1.200	-
NOTM Development/ Enhancement	MIPR	ARL2 : Aberdeen, MD	0.000	0.000		0.000		0.800	Mar 2019	-		0.800	0.000	0.800	-
NOTM Development/ Enhancement	C/FFP	MCTSSA : Camp Pendleton, CA	0.000	0.000		0.000		0.200	Jan 2019	-		0.200	0.000	0.200	-
NOTM Development	C/CPFF	SSC-LANT : Charleston, SC	2.239	0.115	May 2017	1.383	May 2018	0.200	May 2019	-		0.200	Continuing	Continuing	Continuing
NOTM Development	WR	SSC-Pacific : San Diego, CA	0.521	1.038	Feb 2017	0.712	Feb 2018	2.800	Feb 2019	-		2.800	Continuing	Continuing	Continuing
NOTM-A	WR	SSC-Atlantic : Charleston, SC	0.000	1.497	Feb 2017	0.000		0.250	Apr 2019	-		0.250	0.000	1.747	-
NOTM-A	C/CPFF	DTIC : Fort Belvoir, VA	0.000	2.619	Jul 2017	1.125	Feb 2018	0.000		-		0.000	0.000	3.744	-
NOTM-ITV	WR	SSC-A : Charleston, SC	0.000	0.000		0.750	Feb 2018	0.000		-		0.000	0.000	0.750	-
NOTM BMDL SATCOM	WR	ARL : Aberdeen, MD	0.000	0.000		2.250	Mar 2018	0.000		-		0.000	0.000	2.250	-
NOTM Production Enchancement	MIPR	DTIC : Fort Belvoir, VA	0.000	0.000		0.000		0.700	Mar 2019	-		0.700	Continuing	Continuing	Continuing
VSAT GUI Development	C/FFP	CECOM : Aberdeen, MD	0.136	0.482	Jun 2017	0.366	Apr 2018	0.455	Jun 2019	-		0.455	0.000	1.439	-
TWTS NGT Architecture Development	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.200	Nov 2017	0.000		-		0.000	0.000	0.200	-
TWTS NGT MPTA/P Initiation	C/CPFF	TRASYS : GA Tech	0.000	0.000		1.564	Dec 2017	0.050	Dec 2018	-		0.050	Continuing	Continuing	Continuing
COC	WR	SSC-Lant : Chareleston, SC	0.000	0.000		0.000		1.500	May 2019	-		1.500	0.000	1.500	-
COC	WR	NSWC : Dahlgren, VA	0.000	0.000		0.000		0.600	May 2019	-		0.600	0.000	0.600	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2275 / *Marine Corps Tactical Radio 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
COC	C/CPIF	NSWC2 : Dahlgren, VA	0.000	0.000		0.000		0.200	May 2019	-		0.200	0.000	0.200	-
COC	C/CPIF	SSC-Lant2 : Charleson, SC	0.000	0.000		0.000		0.272	May 2019	-		0.272	0.000	0.272	-
Prior Years Cumulative Funding	Various	Various : Various	12.438	0.000		0.000		0.000		-		0.000	0.000	12.438	-
		Subtotal	16.984	6.174		9.892		10.480		-		10.480	Continuing	Continuing	N/A

Remarks

COC realigned from Project C2273 to C2275 starting in 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
TCM Engineering Support	Various	MCSC : Quantico, VA	0.000	0.059	Sep 2017	0.030	Sep 2018	0.335	Sep 2019	-		0.335	Continuing	Continuing	Continuing
VSAT Engineering Support	WR	SSC-PAC : San Diego, CA	0.239	0.252	Feb 2017	0.254	Feb 2018	0.201	Feb 2019	-		0.201	Continuing	Continuing	Continuing
SMART-T Engineering Support	WR	SSC-LANT : Charleston, SC	0.257	0.047	Dec 2016	0.087	Mar 2018	0.087	Mar 2019	-		0.087	Continuing	Continuing	Continuing
TWTS NGT Safety Support	C/CPFF	NSWC : Indian Head, MD	0.000	0.193	May 2017	0.227	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
TWTS Program Management Support	Various	MCSC : Quantico, VA	0.000	0.841	Aug 2017	1.339	May 2018	0.559	May 2019	-		0.559	Continuing	Continuing	Continuing
TWTS NGT Logistics Support	WR	TBD : TBD	0.000	0.000		0.230	May 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	Various : Various	1.323	0.000		0.000		0.000		-		0.000	0.000	1.323	-
TWTS NGT Engineering Support	WR	SSC-LANT : Charleston, SC	0.000	0.000		0.000		0.695	Nov 2018	-		0.695	0.000	0.695	-
		Subtotal	1.819	1.392		2.167		1.877		-		1.877	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2275 / *Marine Corps Tactical Radio 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
TCM FoS Test Activities	TBD	TBD : TBD	0.000	0.000		1.050	Feb 2018	2.020	Aug 2019	-		2.020	Continuing	Continuing	Continuing
TCM MUOS FUE	WR	SPAWAR Lant : TBD	0.000	0.177	Aug 2017	0.000		0.000		-		0.000	0.000	0.177	-
TCM T&E Support	MIPR	DHHS : Bethesda, MD	0.000	0.121	Oct 2017	0.000		0.290	Mar 2019	-		0.290	0.000	0.411	-
TCM RADHAZ PF	WR	NWSC : Dahlgren	0.000	0.054	Feb 2017	0.000		0.000		-		0.000	0.000	0.054	-
TCM FoS Test Assets	C/FFP	MCSC : Quantico, VA	0.000	0.000		2.455	Jun 2018	1.050	Jul 2019	-		1.050	0.000	3.505	-
NOTM Vehicle Integration Testing	WR	SSC-LANT : Charleston, SC	1.013	0.533	Jun 2017	1.975	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
NOTM-A Testing	C/CPFF	DTIC : Fort Belvoir, VA	0.000	3.317	Jun 2017	1.686	Feb 2018	0.000		-		0.000	0.000	5.003	-
NOTM-A Testing	WR	NSWC Crane : Crane, IN	0.000	0.000		0.750	Feb 2018	0.200	Apr 2019	-		0.200	0.000	0.950	-
NOTM-A Testing	WR	SSC PAC : San Diego, CA	0.000	0.000		0.750	Feb 2018	0.000		-		0.000	0.000	0.750	-
NOTM EOL	C/CPFF	SSC_LANT : Charleston, SC	0.236	0.000		0.000		0.200	Apr 2019	-		0.200	0.000	0.436	-
NOTM SWAP Reduction ECP	C/CPFF	SSC-LANT : Charleston, SC	0.000	1.824	May 2017	0.000		0.000		-		0.000	0.000	1.824	-
NOTM ITV Testing	C/CPFF	TBD : TBD	0.000	0.000		0.000		0.287	May 2019	-		0.287	0.000	0.287	-
VSAT Testing	MIPR	TBD : TBD	0.000	0.094	Jul 2017	0.211	Feb 2018	2.683	Jan 2019	-		2.683	Continuing	Continuing	Continuing
TWTS T&E Support	C/FFP	Dept. of Human Health and Services : Rockville, MD	0.000	0.222	Dec 2016	0.366	Feb 2018	0.220	Feb 2019	-		0.220	Continuing	Continuing	Continuing
TWTS NGT MILSTD c/x-band Testing	TBD	SPAWAR : TBD	0.000	0.000		0.365	Dec 2017	0.839	Feb 2019	-		0.839	Continuing	Continuing	Continuing
TWTS NGT JTIC Certification Plan	TBD	TBD : TBD	0.000	0.000		0.200	Nov 2017	0.227	Feb 2019	-		0.227	0.000	0.427	-
Prior Years Cumulative Funding	Various	Various : Various	10.025	0.000		0.000		0.000		-		0.000	0.000	10.025	-
		Subtotal	11.274	6.342		9.808		8.016		-		8.016	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

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
TCM Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	0.474	0.059	Feb 2017	0.295	Feb 2018	0.000		-		0.000	0.000	0.828	-
NOTM Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	0.000	0.000		0.000		0.200	Dec 2018	-		0.200	0.000	0.200	-
VSAT Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	5.009	0.060	Feb 2017	0.077	Feb 2018	0.077	Feb 2019	-		0.077	0.000	5.223	-
SMART-T Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	0.100	0.067	Feb 2017	0.100	Feb 2018	0.103	Feb 2019	-		0.103	Continuing	Continuing	Continuing
TWTS Engineering Support	FFRDC	US Army, MITRE : Stafford, Va	0.000	0.371	Feb 2017	0.383	Feb 2018	0.458	Feb 2019	-		0.458	0.000	1.212	-
COC Engineering Support	FFRDC	US Army, MITRE : Stafford, VA	0.000	0.000		0.000		2.538	Feb 2019	-		2.538	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	FFRDC	US Army, MITRE : Stafford, VA	5.698	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	11.281	0.557		0.855		3.376		-		3.376	Continuing	Continuing	N/A

Remarks

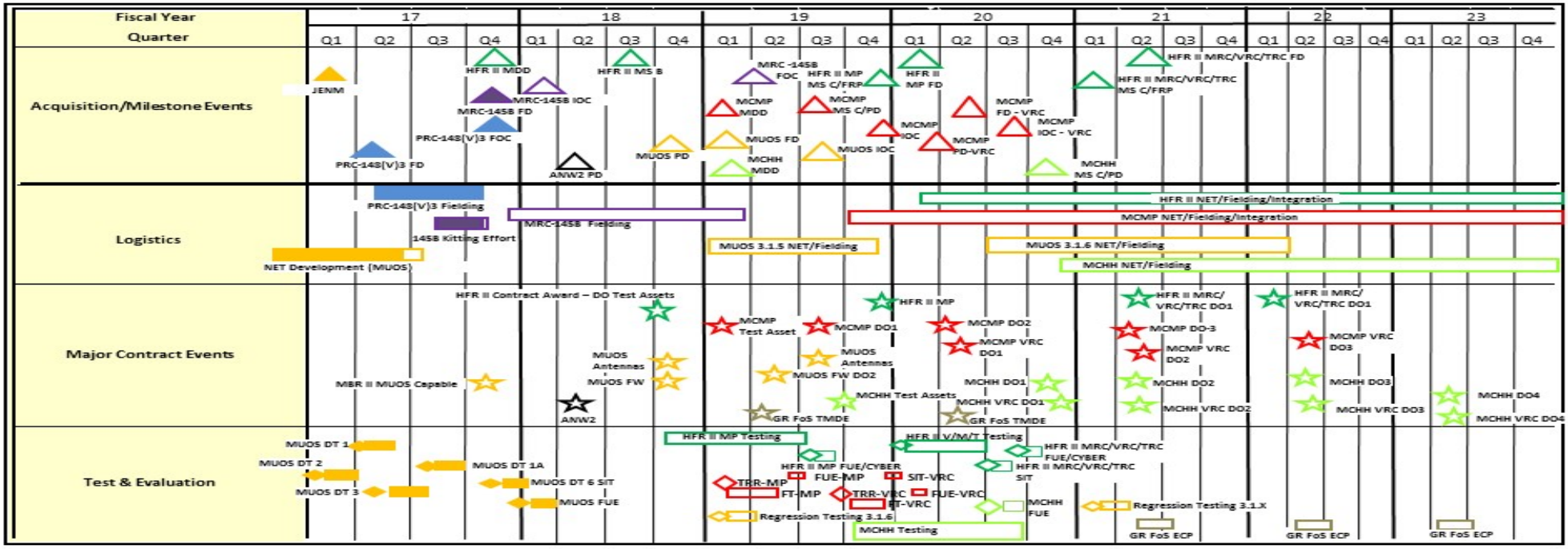
COC realigned from Project C2273 to C2275 starting in FY19.

	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	41.358	14.465		22.722		23.749		-		23.749	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

TCM Schedule



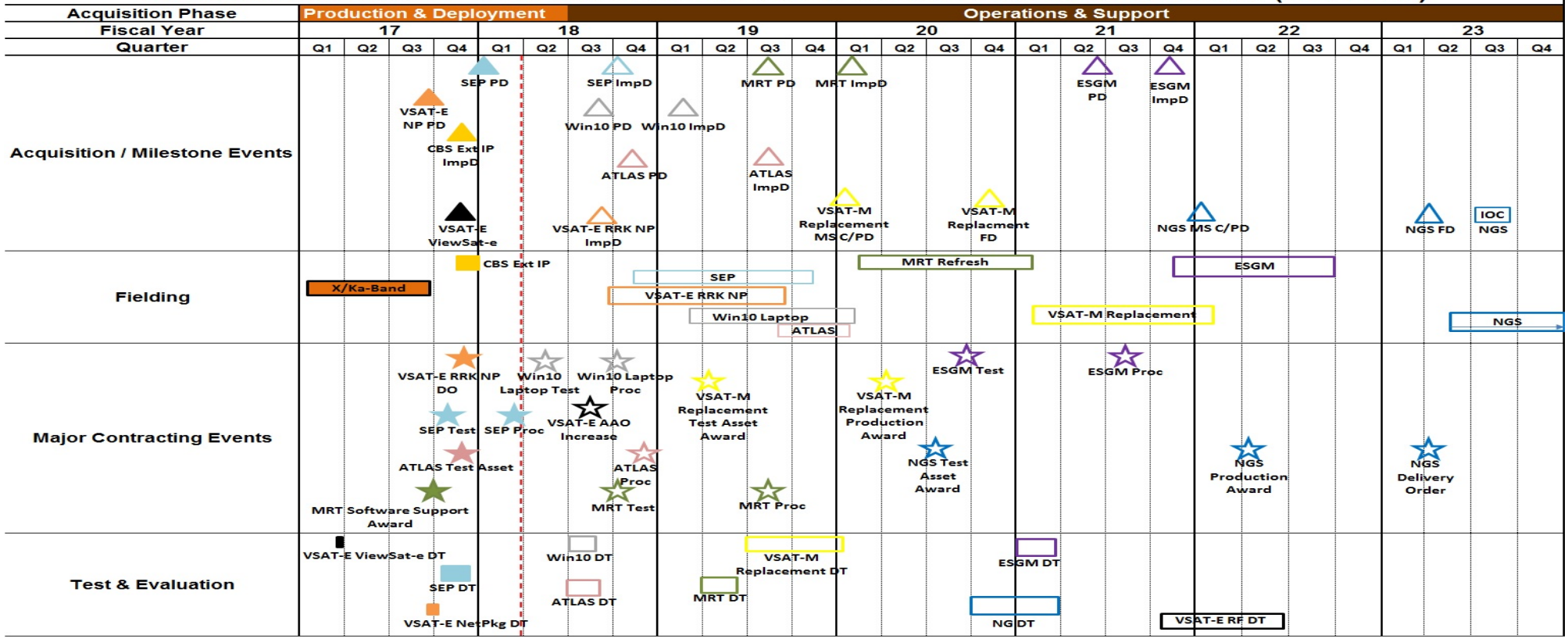
*Note: Multi-Channel Man Pack (MCMP) (Formerly know as MBR Replacement (MBR R)) and Multi-Channel Handheld (MCHH) (Formerly known as THHR Replacement (THHR R))

Legend: Planned Contract Awards; Review; Milestone / Key Acquisition Event

MUOS; ANW2; MRC-145B; HFR II; THHR Maritime; Multi-Channel Handheld (MCHH); Multi-Channel Man Pack (MCMP); GR FoS

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

PROGRAM SCHEDULE - VERY SMALL APERTURE TERMINAL FAMILY OF SYSTEMS (VSAT FoS)



ATLAS: Adaptable Tactical Lightweight Antenna System (formerly VSAT ISA)
ESGM: Enterprise Satellite Gateway Modem
FD: Fielding Decision
ImpD: Implementation Decision
MRT: Master Reference Terminal
NGS: Next Generation SATCOM
NP: Network Package
PD: Procurement Decision
SEP: Signal Entry Panel (VSAT Large)

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

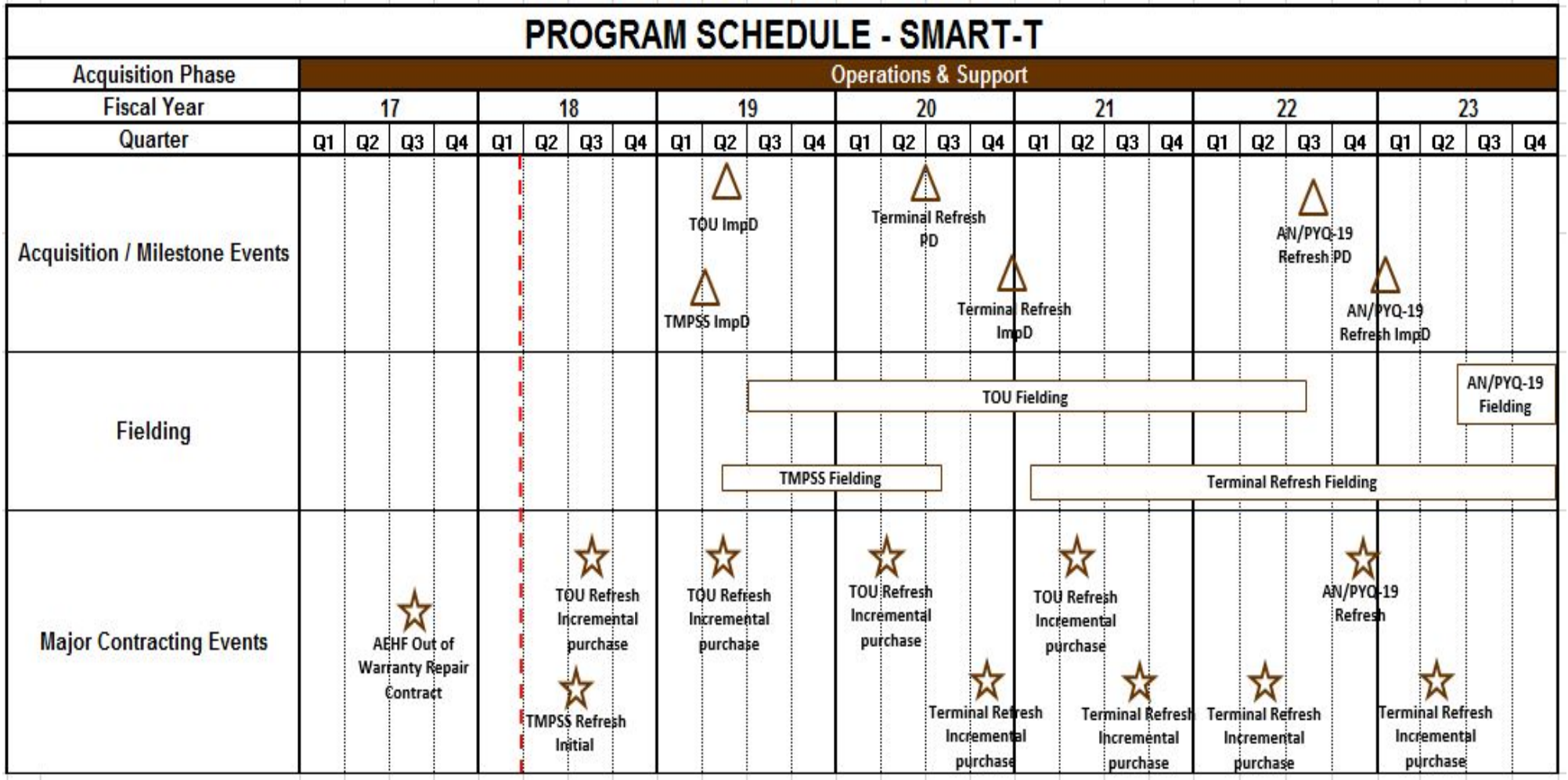


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

Combat Operations Center (COC) Program Schedule

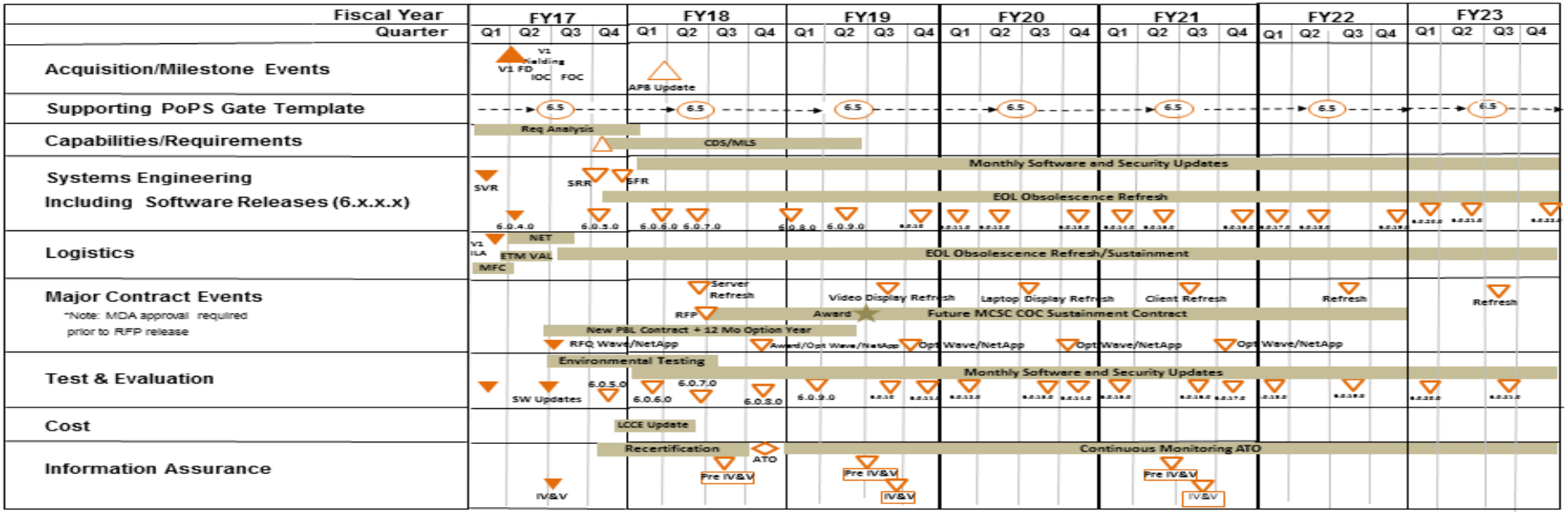


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

Networking On The Move (NOTM) GCV, Air, ITV

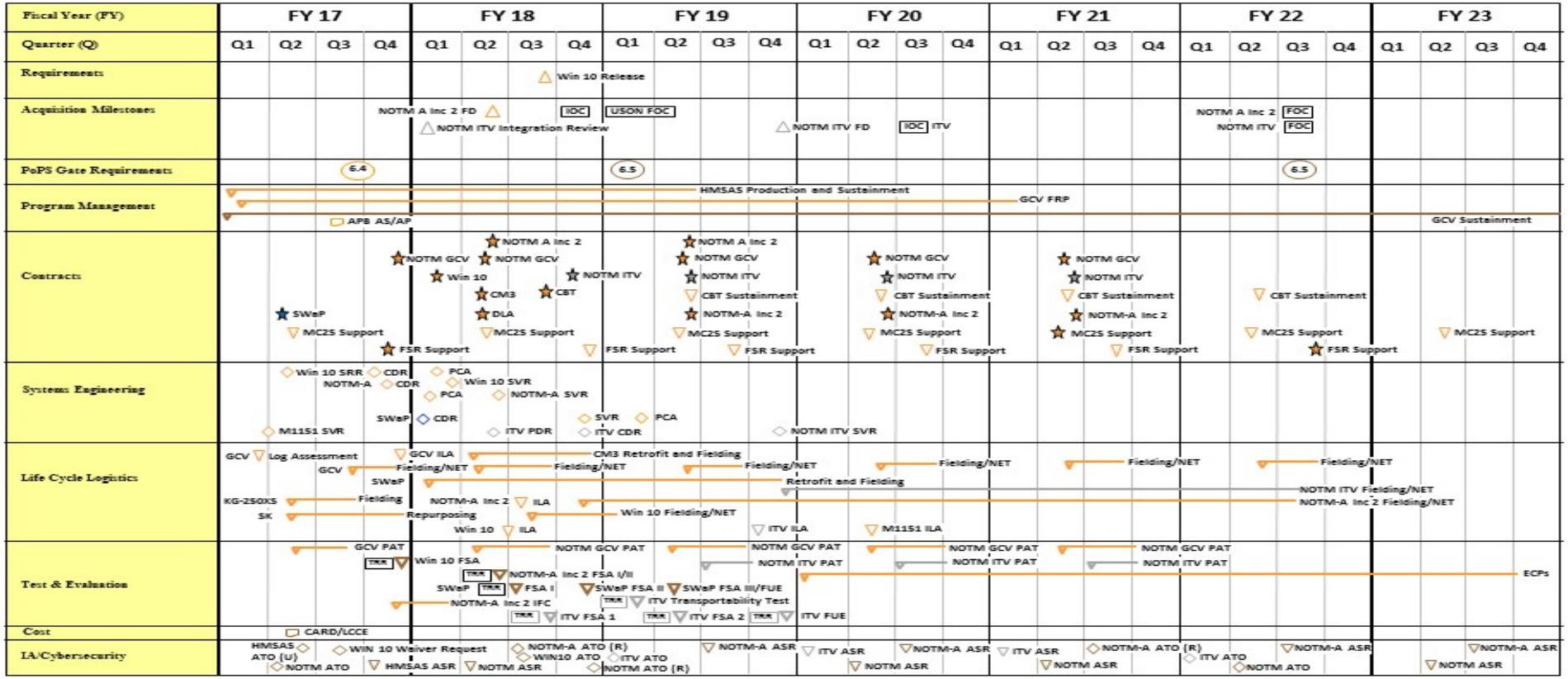


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

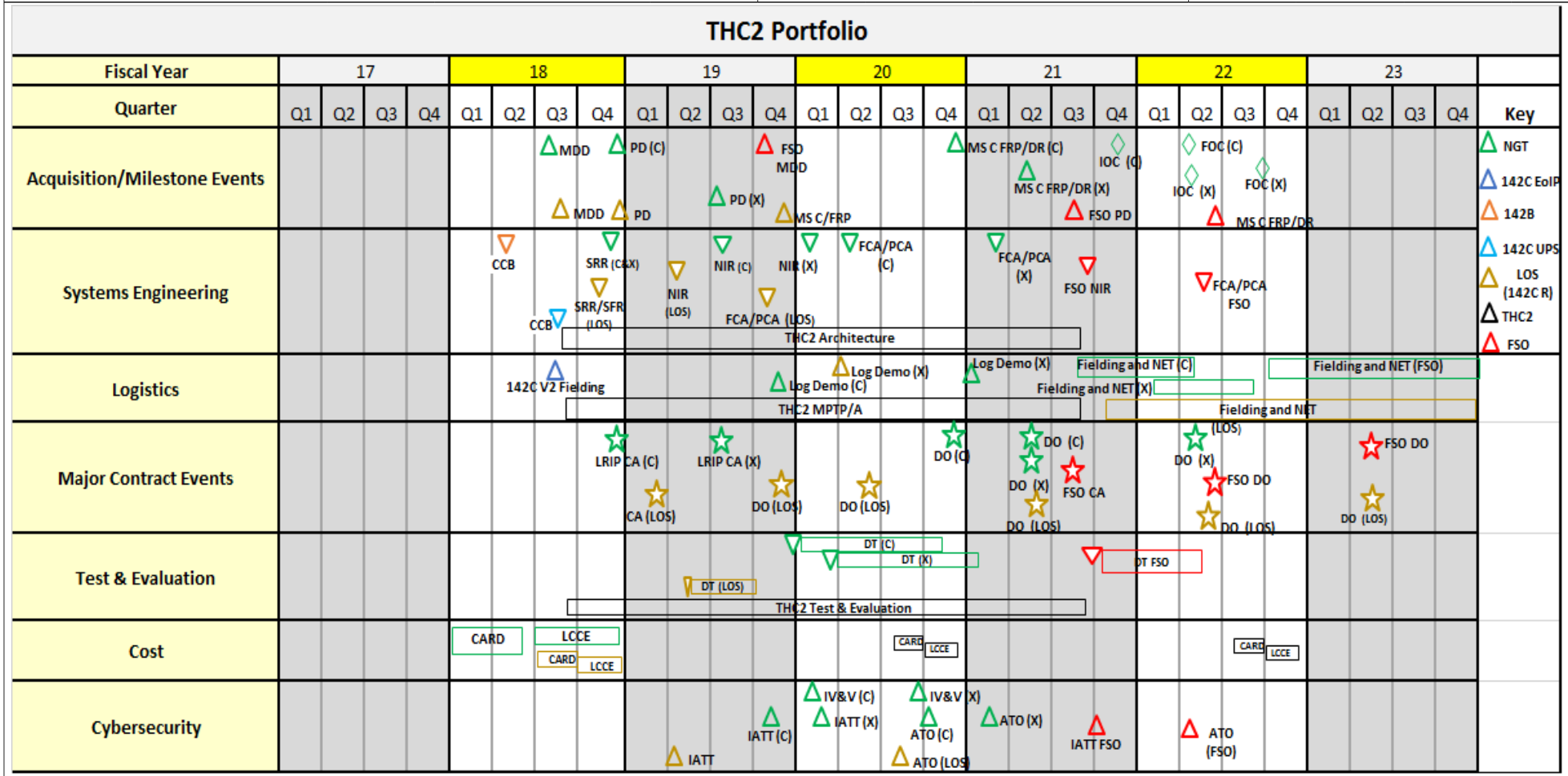


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2275				
TCM MRC-145B IOC	1	2018	1	2018
TCM MUOS Procurement Decision	4	2018	4	2018
TCM MUOS Contract Award	4	2018	4	2018
TCM HFR II Test Assets Contract Award	4	2018	4	2018
TCM MUOS Fielding Decision	1	2018	1	2018
TCM MUOS IOC	1	2019	1	2019
VSAT Signal Entry Panel Fielding	4	2018	4	2019
VSAT Inflatable Satellite Antenna (ATLAS) Procurement	4	2018	4	2018
VSAT WIN 10 Procurement	4	2018	4	2018
VSAT WIN 10 Fielding	1	2019	1	2020
VSAT Inflatable Satellite Antenna (ATLAS) Fielding	3	2019	1	2020
VSAT-E Network Package Refresh Fielding	4	2018	3	2019
VSAT MRT Procurement	3	2019	3	2019
VSAT VSAT-M Replacement Test Asset Procurement	2	2019	2	2019
VSAT VSAT-M Replacement Testing	3	2019	1	2020
SMART-T TMPSS Procurement	3	2018	3	2018
SMART-T TOU Procurement	3	2018	3	2018
SMART-T TMPSS Fielding	2	2019	3	2020
SMART-T TOU 2nd Increment Procurement	2	2019	2	2019
SMART-T TOU Fielding	3	2019	3	2022
TWTS LOS (MRC-142C R) Contract Award	1	2019	1	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2275 / *Marine Corps Tactical Radio Systems*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TWTS NGT PD (X)	3	2019	3	2019
TWTS NGT LRIP Contract Award (X)	3	2019	3	2019
TWTS LOS (MRC-142C R) MSC/FRP	4	2019	4	2019
TWTS LOS (MRC-142C R) DO	4	2019	4	2019
NOTM-A Inc 2 Fielding Decision	2	2018	2	2018
NOTM-A Inc 2 IOC	4	2018	4	2018
NOTM-ITV Fielding Decision	4	2019	4	2019
NOTM Windows 10 Fielding	3	2018	1	2019
COC Server Refresh Procurement	2	2018	2	2018
COC Video Display Refresh Procurement	3	2019	3	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2276 / *Comms Switching and Control 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
2276: *Comms Switching and Control Sys*	42.703	1.791	2.799	1.675	-	1.675	1.778	1.815	1.653	1.686	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The FY 2019 funding request was decreased by $1.124M due to transition of Network Planning & Management (NPM) into sustainment and reduced development efforts for Combat Data Network (CDN) hardware updates.

A. Mission Description and Budget Item Justification

(U) Network Planning & Management (NPM) is a portfolio of communications planning and Network Management applications for use throughout the Marine Air-Ground Task Force (MAGTF). NPM consists of items such as the Systems Planning Engineering and Evaluation Device (SPEED). NPM provides the Marine Forces (MARFOR) component planners with the ability to conduct high-level planning; detailed planning and engineering; monitoring; control and reconfiguration; and spectrum planning and management in support of Combatant Commander (COCOM) and Commander, Joint Task Force (CJTF) operations. SPEED provides High Frequency (HF) predictions, Line of Site (LOS) propagation, Radio Coverage Analysis (RCA), Satellite Planning, Command and Control Personal Computer (C2PC) track interface, interference and de-confliction analysis, spectrum management, Radio Guard Charts, Comm-On-The-Move (COTM), and T/E (training & education) and force structure management. Decrease of $0.905M from FY18 to FY19 reflects program transition to sustainment.

(U) Tactical Voice Switching System (TVSS): The TVSS is a modular Integrated Services Digital Network (ISDN) circuit switch capable system that combines voice and Voice Over Internet Protocol telecommunications, multiplexing, transmission encryption, and group modem capabilities in one system for command, control, administrative, and logistic voice communications. Facilitates secure and non-secure voice, circuit switching functions, and network routing and management functions with current fielded tactical systems of the military services. Interoperates with joint, coalition, and host nation networks, and operates in unclassified and classified environments.

(U) Combat Data Network (CDN), formerly Data Distribution System - Modular (DDS-M): The CDN provides the commander a modular, integrated, and interoperable Internet Protocol (IP)- based LAN and WAN data networking capability that forms the data communications backbone and data communications support to organizations within a MAGTF. The CDN provides extension of the Defense Information System Network (DISN), Secret Internet Protocol Router Network (SIPRNet), Sensitive But Unclassified (SBU), Non-secure Internet Protocol Router Network (NIPRNet) as well as a Coalition networking capability and access to strategic, supporting establishments, joint and other service component tactical data networks for Marine Corps Tactical Data Systems (TDSs) and other CDN. The CDN provides Marine Corps maneuver elements with a modular and scalable IP data transport capability that will replace, supplement and be used with existing legacy data systems through the integration of computers, routers, data switches and cabling, radio net interface units, modems, link encryption devices, and patch panels. Uninterrupted Power Supplies (UPS) provide for emergency power and continuity of operations. The CDN can operate from the SBU up to the Top Secret/Sensitive Compartmented Information (TS/SCI) level and contains integral In-line Network Encryption (INE) device supporting IP Security (IPSec) and Virtual Private Networking (VPN). Decrease

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

of $0.220M from FY18 to FY19 reflects completion of server design, testing, and procurement of prototypes and test articles and transition to reconfiguration of Battalion and below CDN systems to reduce size, weight, and power (SWaP).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NPM: Product Development	0.519	0.905	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Decrease of $0.905M from FY18 to FY19 reflects program transition to sustainment. ***FY 2018 Plans:*** Completes development of additional enhancements and capabilities within the System Planning Engineering and Evaluation Device (SPEED) software testing. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was decreased by $1.124M due to transition of Network Planning & Management (NPM) into sustainment and reduced development efforts for Combat Data Network (CDN) hardware updates.					
Title: TVSS: Management Services	0.047	0.067	0.068	0.000	0.068
Articles:	-	-	-	-	-
FY 2018 Plans: Continue system accreditation with annual cyber security testing. ***FY 2019 Base Plans:*** Continue system accreditation with annual cyber security testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: CDN: Product Development	0.360	0.521	0.654	0.000	0.654
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Decrease of $.133M from FY18 to FY19 reflects transition to Network Optimization and reconfiguration efforts supported by Management Services contract to reduce size, weight, and power (SWaP) requirements of the CDN systems. ***FY 2018 Plans:*** Continue development and implementation of required hardware includes VMware and Small Form Factor. ***FY 2019 Base Plans:*** Continue development and implementation of required hardware for Small Form Factor. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: CDN: Test and Evaluation	0.593	0.610	0.444	0.000	0.444
Articles:	-	-	-	-	-
FY 2018 Plans: Continue support for joint interoperability test certification efforts demonstrated through DoD Interoperability Communication Exercises for equipment that includes VMware and Small Form Factor. ***FY 2019 Base Plans:*** Continue support for joint interoperability test certification efforts demonstrated through DoD Interoperability Communication Exercises for Small Form Factor. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: CDN: Management Services	0.272	0.696	0.509	0.000	0.509
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue FFRDC systems engineering efforts, interoperability analysis, acquisition planning, support for technology research and obsolescence. Initiate FFRDC efforts in support of Network Optimization and reconfiguration efforts to reduce size, weight, and power (SWaP) requirements of the CDN systems. ***FY 2019 Base Plans:*** Continue FFRDC efforts in support of Network Optimization and reconfiguration efforts to reduce size, weight, and power (SWaP) requirements of the CDN systems. ***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	1.791	2.799	1.675	0.000	1.675

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
• PMC/4634-1: *TVSS*	3.378	8.350	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	198.968
• PMC/4634-2: *CDN*	26.967	44.628	35.844	-	35.844	29.944	35.757	36.355	37.128	Continuing	Continuing

Remarks

D. Acquisition Strategy

(U) Network Planning and Management (NPM): NPM will maximize use of existing Commercial Off-The-Shelf (COTS) and Government Off-The-Shelf (GOTS) products. NPM will continue to be upgraded as technology advances. Major focus will be on the incorporation of additional capabilities and functionality into the SPEED software to meet user requirements. R&D effort will focus on the development, integration, and testing of improved versions of existing capabilities. Program will transition to sustainment in FY19.

(U) Tactical Voice Switching System (TVSS) (formerly Transition Switch Module (TSM)): TVSS will maximize use of existing COTS, GOTS, and Government-Furnished Equipment (GFE). TVSS hardware and software will continue to be upgraded and improved as technology advances. Major focus will be on interoperability and compatibility with existing systems and components in the Marine Corps, as well as Joint and Coalition forces. R&D effort will focus on integration and testing of improved versions of existing components.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

(U) Combat Data Network (CDN), formerly Data Distribution System - Modular (DDS-M): CDN will maximize use of existing COTS, GOTS, and GFE. CDN hardware and software will continue to be upgraded and improved as technology advances. Major focus will be on interoperability and compatibility with existing systems and components in the Marine Corps, as well as Joint and Coalition forces. R&D effort will focus on integration and testing of improved versions of existing components. CDN may reuse other Services' development and utilize external contracts that satisfy requirements and analysis of alternatives.

E. Performance Metrics

Milestone reviews and technical reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2276 / *Comms Switching and Control 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
NPM (SPEED S/W Development)	WR	NSWC : Crane, IN	0.780	0.189	Nov 2016	0.165	Nov 2017	0.000		-		0.000	0.000	1.134	-
NPM (SPEED S/W Development)	C/CPFF	NSWC2 : Crane, IN	0.230	0.000		0.740	Jun 2018	0.000		-		0.000	0.000	0.970	-
CDN Development Efforts	WR	MCTSSA : Camp Pendleton, CA	0.000	0.360	Jul 2017	0.000		0.000		-		0.000	0.000	0.360	-
CDN Development Efforts	C/CPFF	NAWC-AD : Patuxent River, MD	0.000	0.000		0.521	Apr 2018	0.654	Apr 2019	-		0.654	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	Various : Various	28.246	0.000		0.000		0.000		-		0.000	0.000	28.246	-
		Subtotal	29.256	0.549		1.426		0.654		-		0.654	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 Year Cumulative Funding	Various	Various : Various	5.696	0.000		0.000		0.000		-		0.000	0.000	5.696	-
		Subtotal	5.696	0.000		0.000		0.000		-		0.000	0.000	5.696	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
CDN Testing	WR	SSC PAC : San Diego, CA	0.466	0.515	Dec 2016	0.530	Dec 2017	0.364	Dec 2018	-		0.364	Continuing	Continuing	Continuing
CDN Integration testing	WR	JITC : Ft. Huachuca, AZ	0.000	0.078	Jan 2017	0.080	Jan 2018	0.080	Jan 2019	-		0.080	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	Various : Various	1.569	0.000		0.000		0.000		-		0.000	0.000	1.569	-
		Subtotal	2.035	0.593		0.610		0.444		-		0.444	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

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
NPM	FFRDC	MITRE : Stafford, VA	0.000	0.330	Sep 2017	0.000		0.000		-		0.000	0.000	0.330	-
TVSS	FFRDC	MITRE : Stafford, VA	1.034	0.047	Dec 2016	0.067	Dec 2017	0.068	Dec 2018	-		0.068	0.000	1.216	-
CDN	FFRDC	MITRE : Stafford, VA	0.565	0.272	Dec 2016	0.696	Dec 2017	0.509	Dec 2018	-		0.509	0.000	2.042	-
Prior Year Cummulative Funding	FFRDC	MITRE : Stafford, VA	4.117	0.000		0.000		0.000		-		0.000	0.000	4.117	-
		Subtotal	5.716	0.649		0.763		0.577		-		0.577	0.000	7.705	N/A

Remarks

CDN product development transitions to MITRE FFRDC support 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	42.703	1.791		2.799		1.675		-		1.675	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

TVSS (FY17 – FY23)

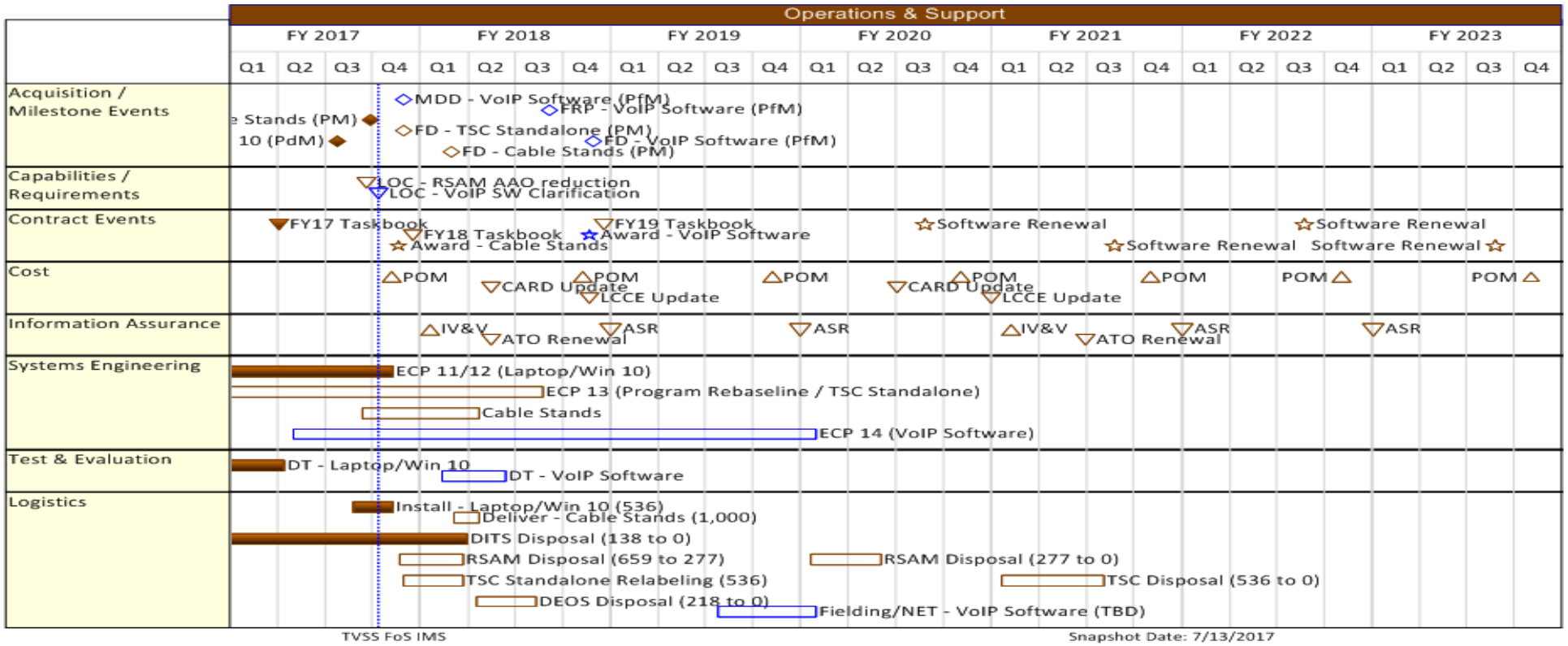


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

CDN (FY17 – FY23)

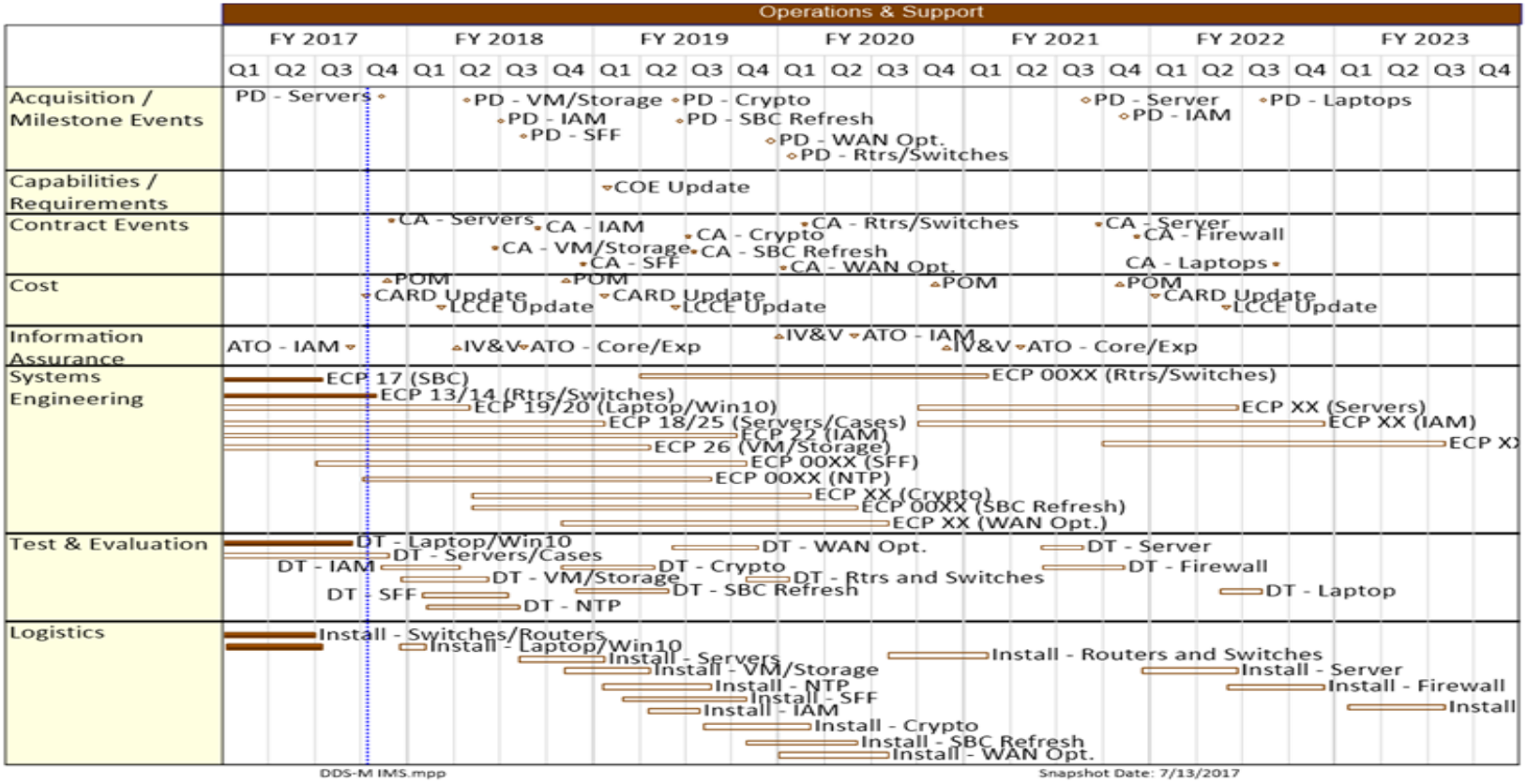


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2276 / *Comms Switching and Control Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2276				
CDN Procurement Decision (PD) Servers	4	2017	4	2017
CDN Contract Award (CA) Servers	4	2017	4	2017
CDN PD IAM	2	2018	2	2018
CDN PD - VMware	2	2018	2	2018
CDN Install VMware	4	2018	2	2019
CDN DT Small Form Factor (SFF)	1	2018	3	2018
CDN DT Crypto	4	2018	2	2019
CDN DT SBC Refresh	4	2018	2	2019
CDN Install Laptop	4	2017	1	2018
CDN Install Servers	3	2018	1	2019
TVSS Fielding Decision TSC Standalone	4	2017	4	2017
TVSS CA Cable Stands	4	2017	4	2017
TVSS Fielding Decision Cable Stands	1	2018	1	2018
TVSS Full Rate Production Decision (FRP) VoIP Software	3	2018	3	2018
TVSS CA VoIP	4	2018	4	2018
TVSS Fielding Decision VoIP Software	4	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2277 / *System Engineering and 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
2277: *System Engineering and Integration*	43.343	4.763	8.314	4.370	-	4.370	13.010	4.930	5.029	5.133	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, Marine Civil Information Management System (MARCIMS), Public Affairs System (PAS) and Military Information Support Operations (MISO) funding has been realigned to project 3772, Information Related Capabilities. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

This project provides funds for engineering, test, and evaluation activity, which ensures that the systems being developed within the Program Element (PE) employ consistent standards for interoperability and to the maximum extent feasible use of hardware and software which is uniform and standard across programs.

Expeditionary Energy Office (E2O): Energy is a top priority for the USMC and one of the six pillars of Modernization for the Corps identified by the Commandant. In 2009, the Commandant established the USMC Expeditionary Energy Office (E2O), with the mission to analyze, develop, and direct the Marine Corps' energy strategy in order to optimize expeditionary capabilities across all warfighting functions. E2O's role is to advise the Marine Requirements Oversight Council (MROC) on all energy and resource related requirements, acquisitions, and programmatic decisions. This office and funding directly support execution of the USMC Expeditionary Energy Strategy and Implementation Plan (Mar 2011), and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment (Sep 2011), as well as Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. The Marine Corps program aligns with the Commandant's Planning Guidance 2010, the National Defense Authorization Act 2009, DoD directives and SECNAV goals. This funding will support the achievement of the Strategy, and the activities of the USMC Expeditionary Energy Concepts process, managed by the E2O.

Joint Interoperability of Tactical Command and Control Systems (JINTACCS) is a Joint Chiefs-of-Staff (JCS)/DoD-mandated program for joint development, implementation, and testing of tactical data links and US Message Text Format (MTF) under the direction of the Defense Information Systems Agency (DISA) and Office of the Secretary of Defense/ Networks and Information Integration (OASD/NII) per the Commander Joint Chiefs of Staff (CJCSI) Instructions 6610.01C and CJCS16241.04 respectively. This effort also covers interoperability and testing of tactical message standards such as MILSTD 6017 Variable Message Format used between the US Army and USMC; and Coalition message formats the Joint Command, Control, Consultation Information Exchange Data Model (JC3IEDM). Responsible for the development of Net Centric standards (XML, Web Services) to meet requirements of USMC/DoD/Coalition Net Centric Data Strategies. Efforts in this area include NATO Coalition interoperability initiatives, Army/Marine Corps Board support, and interoperability testing and certification to include cross domain.

Systems Engineering, Integration and Coordination (SEIC) is MCSC Chief Engineer's systems engineering and integration program. SEIC provides the decision support tools and engineering analysis resources needed to assess, identify and resolve Marine Air Ground Task Force (MAGTF)inter-systems' SoS issues and challenges. SEIC supports DC CD&I, DC PP&O, DC A, DC I&L, DC M&RA, HQMC C4, and HQMC INT in the analysis, evaluation, and assessment of MAGTF Systems and

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

SoS requirements. SEIC centralized management of C4ISR programs allows the implementation of systems engineering certification process in support of milestone decision approval; a requirements and functional analysis process enabling system of systems engineering and an overarching C4ISR systems architecture, and a product realization process to support budget decisions. SEIC engineering conducts functional analyses for emergent system of systems challenges and ensures seamless integration and maximum interoperability of materiel across USMC, Naval, Joint, and DoD programs consistent with the Commandant's Vision and Strategy 2025.

Marine Civil Information Management System (MARCIMS) is a system of systems comprised of people, process and technology that operates in the full Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment. It is a force multiplier for the commander that allows him to leverage the process of Planning, Collection, Consolidation, Analysis, Production, and sharing of civil information in order to support the visualization and understanding of the civil environment to the military commander's decision making process. This program transitions from C2277 to C3772 in FY19.

Public Affairs System (PAS) provides the Marine Air Ground Task Force (MAGTF) and the broader Marine Corps the capability to research, understand and affect the information environment. PA Marines and Systems enable commanders at all levels and across the range of military operations to engage domestic and foreign publics whose trust, confidence, and understanding are mission critical. The Public Affairs Systems (PAS) AAP identifies and fields materiel solutions required to research and plan communication initiatives, acquire still and video visual information, produce and disseminate communication products, and assess the effects of communication initiatives within the information environment. The program maintains an evolutionary approach to acquisitions, and leverages commercial industry-standard non-developmental items to provide the best value to the Marine Corps, while keeping PA Marines appropriately equipped to understand and affect the information environment. This effort supports research and evaluate solutions to modernize the Public Affairs Still Acquisition System into a single handheld device with the capability to acquire, edit and transmit still and video imagery and engage publics via traditional and social media. This program transitions from C2277 to C3772 in FY19.

The Military Information Support Operations (MISO)Family of Systems (FOS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MISN), provides the Marine Air Ground Task Force (MAGTF) Commander the capability to conduct planned operations to convey selected information and indicators to foreign adversary, neutral and friendly target audiences to influence their emotions, motives, objective reasoning, providing an operational advantage. The MISO was established in response to multiple Marine Requirements Oversight Council Memorandums, and the approval of a MISO Organizational and Operational (O&O) Concept, 16 June 2015. MISO capabilities are critical to the success of the MAGTF mission, enabling commanders to shape the information environment, counter enemy propaganda, misinformation, disinformation, and adversarial narratives. The Signature Management (SIGMAN) capability will support MAGTF Operations with a baseline capability to include Own-force signature monitoring and assessment, Electromagnetic signature masking and projection, and physical decoys. This program transitions from C2277 to C3772 in FY19.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Expeditionary Energy Office (E2O)	2.156	2.199	2.202	0.000	2.202
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and 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 support the USMC Expeditionary Energy Strategy and Implementation Plan, and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment, as well as Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. Using these priority roadmaps, E2O will invest in R&D programs to advance Strategy goals. Priority areas for investment include, but are not limited to: Energy harvesting; hybrid power; efficient heating and cooling of people, equipment and water; energy storage; energy efficient vehicles; energy metering and monitoring and decision tools; energy efficient shelters and sustainment. ***FY 2019 Base Plans:*** - Continue to support the USMC Expeditionary Energy Strategy and Implementation Plan, and priorities identified in the USMC Expeditionary Energy Water and Waste Initial Capabilities Document/Capabilities Based Assessment, as well as Science and Technology Objectives identified in the 2012 USMC S&T Strategic Plan. Using these priority roadmaps, E2O will invest in R&D programs to advance Strategy goals. Priority areas for investment include, but are not limited to: Fuel distribution, Energy harvesting; hybrid power; efficient heating and cooling of people, equipment and water; energy storage; energy efficient vehicles; energy metering and monitoring and decision tools. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: JINTACCS: JCS and DoD CIO Data Links Testing	0.582	0.572	0.570	0.000	0.570
Articles:	-	-	-	-	-
Description: Joint Interoperability of Tactical Command and Control Systems (JINTACCS) is a United States military program for the development and maintenance of tactical information exchange configuration items (CIs) and operational procedures. It was originated to ensure that the command and control (C2 and C3) and weapons systems of all US military services and NATO forces would be interoperable. MARCORSYSCOM Systems Engineering, Interoperability Architectures, and Technology direct the JINTACCS Program. Created as a non-acquisition R&D engineering program it provides for critical engineering services in several areas. JINTACCS is essential to USMC development and maintenance of tactical data exchange standards (Link 16,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
VMF, MTF, etc.), maintenance of C2 systems interoperability issues, development of Net Centric standards (XML, Web Services) to meet requirements of DoD/USMC Net Centric Data Strategy, and participation in Marine Corps, Joint, and Coalition Interoperability Certification testing to DoD/JCS/USMC/ NATO requirements in an ever-changing cyber environment. Requirements annotated in IT Budget Submit (NC-36). Increased involvement with the Army Marine Corps Board (AMCB, 3 Star Charter)), NATO Coalition Interoperability Assurance and Validation (CIAV) and Cross Domain Solution (CDS) certification. ***FY 2018 Plans:*** -Continue to review and update all IT Standards applicable to the USMC and maintain the architectural data environment to ensure all developed solution architectures are associated with the appropriate technical IT standards in their DoDAF Standards View. -Continue to lead the Army - Marine Corps C2 interoperability Systems Engineering IPT to align the use of tactical messaging standards to create interoperability between the DoD ground force systems FBCB2/JTCW (VMF), GCCS (OTH Gold), TBMCS/AFATDS (USMTF), and aviation tactical data links (Link 16/22). -Continue to lead the USMC involvement in NATO forums to ensure USMC tactical C2 systems remain interoperable. -Continue to participate in the development and maintenance of STANAG 4677 and associated architectures to expand interoperability to forces at battalion and below. -Continue to develop and test the implementation of a Multi-Media Gateway (MMG) solution to bridge existing voice, video, and data network standards across tactical and garrison C2 networks through the continued engineering and certification of tactical cross-domain solutions. -Continue to engineer and architect garrison and tactical network standards to continue the MCEN Cyber Vulnerability assessment and support the risk reduction activities to integrate tactical network data exchanges into a Cyber Common Operational Picture to support MARFORCYBER, MCNOSC, and HQMC C4 initiatives through the continued development of MCEN architectures. -Continue implementation of Military Standards for VMF-XML and MTF-XML providing standardized translations of tactical data for seamless, lossless C2 information sharing in net centric operations. ***FY 2019 Base Plans:*** -Initiate to serve as the Marine Corps principal activity for review of Joint Service and NATO interface change proposals (ICPs) and requests for exception (RFEs) to existing TDL, tactical data message, and symbology standards. Reviewed, assessed, staffed, and presented Service positions on 100+ ICPs and RFEs.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate tactical data link and variable message format subject matter expert support to 10 Marine Corps ground systems and two aviation systems acquired by NAVAIRSYSCOM to ensure adherence to standards and to enable interoperability with Joint and Allied command and control and weapon systems. - Initiate Marine Corps equities representation in Joint and Allied Service TDL and tactical data message forums, including participation in the Joint Multi-TDL Configuration Control Board and the Joint Multi-TDL Standards Working Group. - Initiate architectural data environment needed to represent that developed system architectural solutions are associated and traceable to desired capabilities and military standards governing TDL and tactical data message exchange. - Continue to lead the Army-Marine Corps C2 Interoperability Systems Engineering Integrated Process Team (IPT) to align the use of tactical messaging standards between DoD ground, aviation, and intelligence systems. - Continue to participate in the development of STANAG 4677 to establish ground rules for battalion and below cross domain information exchange solutions. - Continue to assess implementation of potential solutions to bridge existing voice, video, and data network standards across tactical and garrison command and control networks. - Continue to assess implementation and potential effects of transition of tactical data links and tactical data messages to extensible markup language (XML)-based schemas, thus supporting interagency and joint/ multinational information exchange. - Continue to participate in National Information Exchange Model (NIEM) information exchange IPTs and working groups. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: SEIC: Engineering and Technical Support	1.770	1.973	1.598	0.000	1.598
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate technical and engineering support to the development of the 2018 Afloat MAGTF C4 Required Capabilities (AMC4RC) Letter. - Continue to contribute to the OPNAV N9 & N2/N6 Blue-In-Support-Of-Green (BISOG) program development.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and 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 engineering support to the development of USMC input to OUSD AT&L's Joint C2 Capability Area FY18/19 Sustainment & Modernization Plan and Plan Build Workshop - Initiate integration MAGTF C2 systems and C4 services with shipboard C2 architectures and C4ISR infrastructures in support of 11th, 13th, 22nd, 26th and 31st MEU deployments via DGSIT. - Continue integration testing with PEO C4I & SPAWAR to integrate MCEN Services and MAGTF C2 Systems into the Navy's Consolidated Afloat Network Enterprise Services (CANES) environment aboard the LHA-6 and LPD-17 class amphibious assault ships. - Continue to baseline and assess options to address gaps within the Information Exchange Capabilities of the MAGTF. - Continue to manage and expand the Engineering Knowledge Management system to provide consumer focused support to the engineering competency in a configuration controlled electronic library system. ***FY 2019 Base Plans:*** - Initiate technical and engineering support to the development of the 2019 Afloat MAGTF C4 Required Capabilities (AMC4RC) Letter. - Continue to contribute to the OPNAV N9 & N2/N6 Blue-In-Support-Of-Green (BISOG) program development. - Continue engineering support to the development of USMC input to OUSD AT&L's Joint C2 Capability Area FY19/20 Integration Workshop - Initiate integration MAGTF C2 systems and C4 services with shipboard C2 architectures and C4ISR infrastructures in direct support of 15th, 11th, 22nd, 24th and 31st MEU deployments via DGSIT. - Conduct focused integration testing with PEO C4I & SPAWAR to integrate MCEN Services and MAGTF C4I Systems into the Navy's follow-on version of Consolidated Afloat Network Enterprise Services (CANES) environment aboard the LHD, LHA-6, LPD and LSD class amphibious assault ships. - Continue to baseline and assess options to address gaps within the Information Exchange Capabilities of the MAGTF. - Continue to manage and expand the Engineering Knowledge Management system to provide consumer focused support to the engineering competency in a configuration controlled electronic library system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: MARCIMS: Marine Civil Information Management System Support	0.164	0.422	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** *2277 / System Engineering and Integration*

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: -Initiate expansion of cloud services to accommodate additional users across the coalition (NATO, etc.) and other government agencies (NGA, etc.), and the joint service (Army Reserves) -Initiate updates to existing MARCIMS database and architecture. -Initiate development required for the MARCIMS 2.0 implementation and Marine Corps Force (MCF) 2025. ***FY 2019 Base Plans:*** -Program transitions to C3772 ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.422M from FY 2018 to FY 2019 due to the program transitions from C2277 to C3772 in FY19.					
Title: Public Affairs System (PAS): Product Development	0.091	0.093	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue the research and evaluation of solutions to modernize the Public Affairs Live Media Engagement System (PALMES) with the capability to transmit imagery and engage publics via traditional and social media via Military Satellite Communications (MILSATCOM). These actions will include the evaluation of device solutions and research of information assurance requirements to accredit the Public Affairs transmission capability. ***FY 2019 Base Plans:*** - Program transitions to C3772 ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.093M from FY 2018 to FY 2019 due to the program transitions from C2277 to C3772 in FY19.					
Title: Military Information Support Operations (MISO): Product Development	0.000	3.055	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and Integration*

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 MISO Family of Systems (FOS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MISN), provides the Marine Air Ground Task Force (MAGTF) Commander the capability to conduct planned operations to convey selected information and indicators to foreign adversary, neutral and friendly target audiences to influence their emotions, motives, objective reasoning, providing an operational advantage. Funds increase from FY17 to FY18 initiates product development of the Fly-Away Broadcast System (FABS) in preparation for a MS B decision. Funds transition to C3772 in FY19. ***FY 2018 Plans:*** Initiate product development of the Fly-Away Broadcast System (FABS) in preparation for a MS B decision. - Complete a production design of the FABS - Validate FABS production requirements - Manage FABS technical risk - Update cost estimates - Define system support requirements ***FY 2019 Base Plans:*** - Program transitions to C3772 ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $3.055M from FY 2018 to FY 2019 due to the program transitions from C2277 to C3772 in FY19.					
Accomplishments/Planned Programs Subtotals	4.763	8.314	4.370	0.000	4.370

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/4620a: *MARCIMS*	0.227	0.235	0.296	-	0.296	0.000	0.302	0.000	0.308	Continuing	Continuing
• PMC/4620b: *Public Affairs Systems*	0.929	1.913	0.682	-	0.682	0.691	0.710	0.722	0.736	Continuing	Continuing
• PMC/4620c//: *MISO*	0.000	0.000	2.976	-	2.976	8.364	9.924	9.938	7.853	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2277 / *System Engineering and 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

Remarks

D. Acquisition Strategy

MARCIMS will continue to support and sustain the current baseline system, while employing incremental changes to ensure that the system not only meets current requirements per the Letter of Clarification, but also allows for a more user friendly system. MARCIMS plans to begin development of MARCIMS 2.0 in a partnership with ONR, while simultaneously maintaining the current and approved version of the system.

Public Affairs System will maximize the utilization of commercial-off-the-shelf devices and software to provide best overall performance solutions to the warfighter with minimal developmental cost and schedule investments.

MISO will complete a production design of the FABS, validate production requirements, manage FABS technical risk and define system support requirements in FY18, leading to a MS B decision in Q2 FY18, MS C / LRIP decision in Q4 FY19, and an FRP decision in Q3 FY20.

E. Performance Metrics

Technical and program reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** *2277 / System Engineering and 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
Prior Years Cumulative Funding	Various	Various : Various	8.980	0.000		0.000		0.000		-		0.000	0.000	8.980	-
PAS	WR	SSC - PAC : San Diego, CA	0.195	0.091	Mar 2017	0.093	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
MISO	FFRDC	Johns Hopkins University : Laurel, MD	0.000	0.000		0.500	Dec 2017	0.000		-		0.000	0.000	0.500	-
MISO	WR	NAVAIR : Pax River, MD	0.000	0.000		1.515	Apr 2018	0.000		-		0.000	0.000	1.515	-
MISO	WR	SSC-PAC : San Diego, CA	0.000	0.000		1.040	Apr 2018	0.000		-		0.000	0.000	1.040	-
		Subtotal	9.175	0.091		3.148		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
Prior Years Cumulative	Various	Not Specified : Not Specified	18.443	0.000		0.000		0.000		-		0.000	0.000	18.443	-
MARCIMS	WR	NSWC : Indian Head, MD	0.053	0.164	Feb 2017	0.422	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
MAGTF SEI&C	C/FFP	TBD : Various	0.000	0.227	Nov 2016	0.259	Nov 2017	0.000		-		0.000	0.000	0.486	-
MAGTF SEI&C	WR	NSWC : Dahlgren, VA	4.986	0.217	Nov 2016	0.280	Nov 2017	0.230	Nov 2018	-		0.230	Continuing	Continuing	Continuing
MAGTF SEI&C	MIPR	TBD : TBD	0.000	0.529	Nov 2016	0.522	Nov 2017	0.000		-		0.000	0.000	1.051	-
MAGTF SEI&C	MIPR	HHS : TBD	0.000	0.597	Nov 2016	0.712	Nov 2017	0.000		-		0.000	0.000	1.309	-
MAGTF SEI&C	C/FFP	SIMVENTIONS : Stafford, VA	0.061	0.065	Nov 2016	0.065	Nov 2017	0.000		-		0.000	0.000	0.191	-
MAGTF SEI&C	WR	NSWC : DAM NECK, VA	0.000	0.135	Nov 2016	0.135	Nov 2017	0.000		-		0.000	0.000	0.270	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** *2277 / System Engineering and 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
MAGTF SEI&C	C/FP	MANTECH : Stafford, VA	0.000	0.000		0.000		1.368	Nov 2018	-		1.368	0.000	1.368	-
JINTACCS	C/FFP	MCTSSA : Camp Pendleton, CA	1.081	0.550	Jan 2017	0.400	Jan 2018	0.295	Jan 2019	-		0.295	0.000	2.326	-
JINTACCS	C/FFP	VMF Analysis : Quantico, VA	0.000	0.000		0.000	Jan 2018	0.225	Jan 2019	-		0.225	0.000	0.225	-
Experimental Forward Operating Base (E2O)	WR	SSC PAC : San Diego, CA	0.912	0.900	Oct 2016	0.750	Nov 2017	0.350	Nov 2018	-		0.350	0.000	2.912	-
Experimental Forward Operating Base (E2O)	WR	Various : Various	0.146	0.514	Dec 2016	0.754	Nov 2017	0.802	Nov 2018	-		0.802	0.000	2.216	-
Experimental Forward Operating Base (E2O)	WR	NSWC : Carderock	0.198	0.180	Nov 2016	0.250	Nov 2017	0.150	Nov 2018	-		0.150	0.000	0.778	-
Experimental Forward Operating Base (E2O)	WR	NAVFAC EXWC : Port Hueneme, CA	0.280	0.140	Nov 2016	0.120	Nov 2017	0.650	Nov 2018	-		0.650	0.000	1.190	-
Experimental Forward Operating Base (E2O)	WR	NSWC : Panama City, FL	0.200	0.000		0.000		0.075	Nov 2018	-		0.075	0.000	0.275	-
Experimental Forward Operating Base (E2O)	WR	NSWC : Crane, IN	0.054	0.397	Oct 2016	0.300	Nov 2017	0.150	Nov 2018	-		0.150	0.000	0.901	-
Experimental Forward Operating Base (E2O)	C/FFP	TBD : TBD	0.000	0.025	Mar 2017	0.025	Nov 2017	0.025	Nov 2018	-		0.025	0.000	0.075	-
		Subtotal	26.414	4.640		4.994		4.320		-		4.320	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
Prior Years Cumulative	Various	Various : Various	7.611	0.000		0.000		0.000		-		0.000	0.000	7.611	-
		Subtotal	7.611	0.000		0.000		0.000		-		0.000	0.000	7.611	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) *2277 / System Engineering and Integration*	

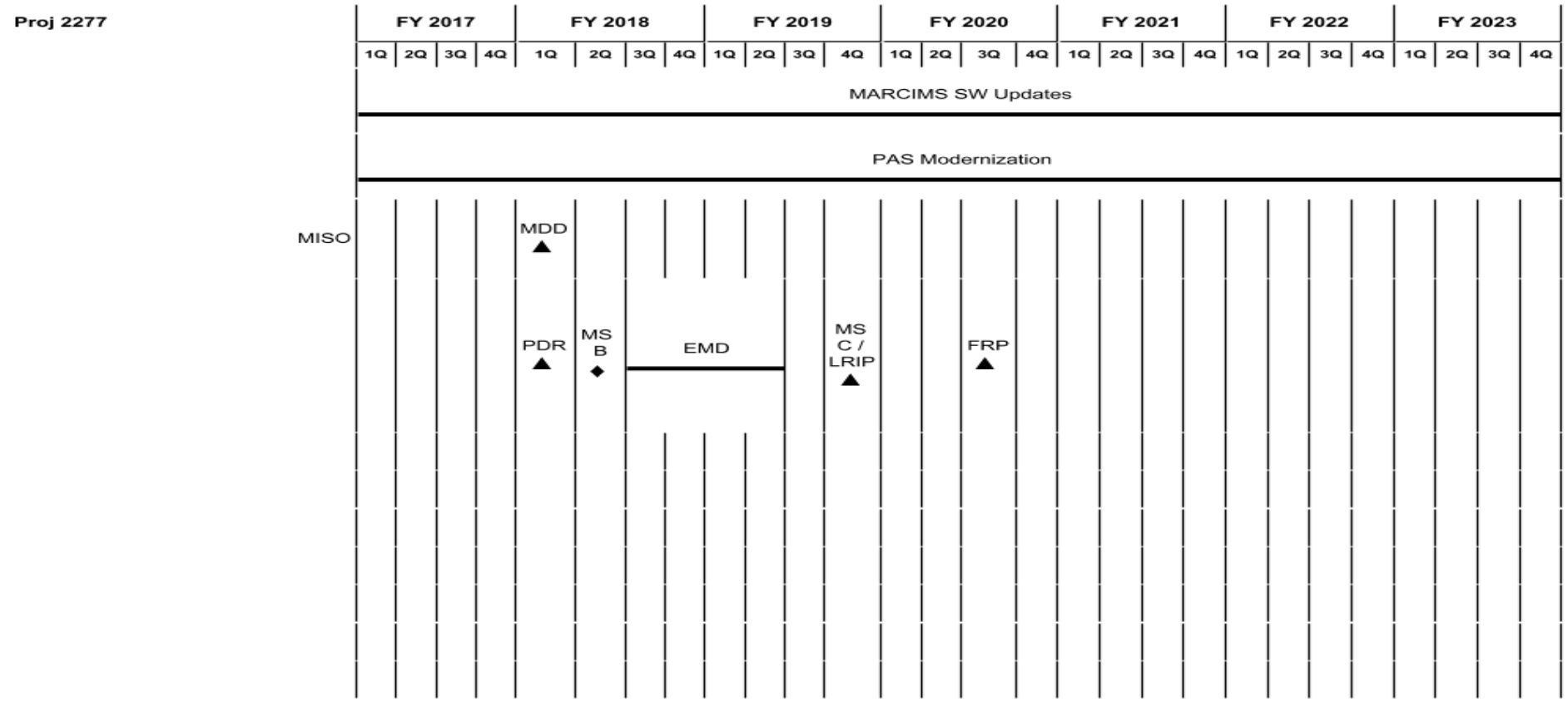
Management Services ($ in Millions)

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
JINTACCS	Various	PROGRAM : TRAVEL	0.143	0.032	Feb 2017	0.172	Feb 2018	0.050	Feb 2019	-		0.050	Continuing	Continuing	Continuing
		Subtotal	0.143	0.032		0.172		0.050		-		0.050	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	43.343	4.763		8.314		4.370		-		4.370	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** *2277 / System Engineering and Integration*



2019DON - 0206313M - 2277

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** *2277 / System Engineering and Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2277				
MARCIMS SW Updates	1	2017	4	2023
PAS Modernization	1	2017	4	2023
MISO: MDD	1	2018	1	2018
MISO: PDR	1	2018	1	2018
MISO: MS B	2	2018	2	2018
MISO: EMD	3	2018	2	2019
MISO: MS C / LRIP	4	2019	4	2019
MISO: FRP	3	2020	3	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2278 / *Air Defense Weapons 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
2278: *Air Defense Weapons System*	46.369	45.058	24.214	73.605	16.130	89.735	40.743	17.724	13.407	27.369	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Ground Based Air Defense-Stinger Sustainment (GBAD-SS) - Based upon the deployment of the Low Altitude Air Defense (LAAD) Battalions and their employment of the Stinger Missile, GBAD-SS transforms Air Defense equipment through technology insertion and equipment repackaging to address capability gaps as the result of equipment obsolescence and the emergent and evolving threats to the Marine Air Ground Task Force (MAGTF). GBAD-SS consists of five efforts: 1) systems engineering support of currently fielded LAAD equipment/assets to include the Stinger Mounted Optic and Mode 5/S Identification Friend or Foe (IFF); 2) redesign and integration of the Advanced Man-Portable Air Defense System (A-MANPADS) Increment 1 Fire Unit Vehicle (FUV) into an operationally capable vehicle configuration; 3) design, test, and integration of new systems for the Fire Unit Vehicle (FUV) to replace aging and failing technology, to retain interfaces with, and be capable of receiving, a Common Aviation Command and Control System (CAC2S) broadcasted link as well as be capable of interfacing with Marine Air Command and Control System (MACCS) equipment; 4) Redesign and re-integration of Section Leader Vehicle (SLV) equipment from the shelter on a M1165 configuration to M1114 configuration, providing a common platform with greater mobility, force protection and maneuverability increasing overall operational capability; 5) Transition from the HMMWV vehicular platform to the JLTV platform for a Maneuver- Short Range Air Defense (M-SHORAD) Capability in order to field a more survivable On-the-Move (OTM) command and control (C2) and kinetic/non-kinetic capability to keep pace with supported operational forces.

GBAD Future Weapons System (GBAD-FWS): The GBAD Program is rapidly approaching the out of production phase for the A-MANPADS Increment I and the end of life for the Stinger missile. The Stinger missile is reliable but older technology, while it remains relevant in the near-term, the GBAD Program is planning for a GBAD Future Weapon System to address a larger array of targets utilizing organic C2 and sensor systems. Leveraging an update to the Analysis of Alternatives (AoA) completed Sept 2016, the GBAD Future Weapon System's Capability Development Document (CDD) is anticipated in the 4th quarter FY18. The GBAD Future Weapon System will consist of multiple weapons system platforms to defeat current and emerging threats for UAS, Fixed Wing/Rotary Wing (FW/RW) aircraft, and cruise missiles. This development effort will consist of a kinetic and non-kinetic capability to defeat the full spectrum of Low-Altitude Low Observable/Low Radar Cross Section threats. Additionally, this budget reflects the Commandant of the Marine Corps (CMC) directed Counter-UAS (C-UAS) assessment, engineering and acquisition efforts to determine and pursue technology solutions required to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission with a focus on C-UAS. Efforts will include assessment, engineering analysis and prototype procurement necessary to evaluate various direct energy, electronic attack, projectile, and missile capabilities to determine the right mix of technologies required to negate aerial threats and provide the MAGTF, as well as, Bases, Posts and Stations, force protection against these threats. With the proliferation of both military and commercial UAS platforms, the program will pursue and acquire a GBAD-FWS platform with a C-UAS capability.

Overall, the Air Defense Weapons System $65.521M increase from FY18 to FY19, in combined baseline and OCO funding, reflects the Marine Corps continued urgent need to address emergency war fighting requirements for a Ground Based Air Defense (GBAD) Future Weapons System (FWS) and the Commandant of the Marine

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

Corp (CMC) directed Counter-UAS (C-UAS) assessment, engineering and acquisition efforts to determine and pursue technology solutions required to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: GBAD STINGER SUSTAINMENT: Product Development	1.016	1.420	1.905	0.000	1.905
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete Stinger Missile Mounted Optic (AN/PAS-18) replacement development. -Complete Mode 5 replacement development. ***FY 2019 Base Plans:*** -Initiate systems design and engineering efforts associated with equipment integration onto a JLTV platform to provide a M-SHORAD capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: GBAD STINGER SUSTAINMENT: Support Costs	0.364	0.462	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Completes A-MANPADS Engineering Change Proposal (ECP) Readiness Analysis. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** A-MANPADS Engineering Change Proposal (ECP) Readiness Analysis complete.					
Title: GBAD STINGER SUSTAINMENT: Test and Evaluation	0.175	0.737	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete Stinger Missile Mounted Optic (AN/PAS-18) Field User Evaluation (FUE).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Complete Mode 5 replacement Field User Evaluation (FUE). -Complete Section Leader Vehicle redesign transportability testing. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Completed Stinger Missile Mounted Optic (AN/PAS-18) Field User Evaluation (FUE). Completed Mode 5 replacement Field User Evaluation (FUE). Completed Section Leader Vehicle redesign transportability testing.					
Title: GBAD STINGER SUSTAINMENT: Program Management Support	0.240	0.664	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete development of acquisition documentation in support of Stinger Identification Friend or Foe (IFF) replacement system. ***FY 2019 Base Plans:*** - ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Completed development of acquisition documentation in support of Stinger Identification Friend or Foe (IFF) replacement system.					
Title: GBAD FWS/COUNTER UAS Product Development	37.227	18.069	61.963	12.390	74.353
Articles:	-	-	-	-	-
Description: Overall, the $56.284M increase from FY18 to FY19, in combined baseline and OCO funding, reflects the Marine Corps continued urgent need to address emergent war fighting requirements for a GBAD Future Weapons System and the Commandant of the Marine Corp (CMC) directed Counter-UAS (C-UAS) assessment, engineering and acquisition efforts to determine and pursue technology solutions required to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission. Efforts					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
include assessment, engineering analysis and prototype procurement necessary to evaluate various direct energy, electronic attack, missile and projectile capabilities to determine the right mix of technologies required to negate aerial threats and provide the MAGTF, as well as, Bases, Posts and Stations, Force Protection against such threats. With the proliferation of both military and commercial UAS platforms, the program will pursue and acquire GBAD-FWS platforms with a C-UAS capability. ***FY 2018 Plans:*** -Continuation of GBAD Future Weapons System/Counter-UAS engineering and prototype development efforts to determine the technology solutions required to defeat the full spectrum of threats to include UAS's associated with the Marine Corps Low-Altitude Air Defense mission. Includes the procurement and integration of prototype systems and operational assessments. Systems provide capabilities such as detect, track, identify, threat negation and lethal destruction, to include utilizing a slew-to-cue optic for a high energy laser engagement. ***FY 2019 Base Plans:*** -Continuation of GBAD Future Weapons System engineering and prototype development efforts to determine the technology solutions required to defeat the full spectrum of threats to include UAS's associated with the Marine Corps Low-Altitude Air Defense mission, specifically the Group 1 and 2 threats. Systems will provide capabilities such as detect, track, identify, threat negation and lethal destruction, to include utilizing a slew-to-cue optic system for a high energy laser engagement. Funding will purchase Coyote multi-mission C-UAS drone launchers, C-UAS Component Integration Kits for the Mine Resistant Ambush Protected-All Terrain Vehicle (M-ATV) and a C-UAS C2 Network. -Initiates C2 and Sensor engineering development to integrate a medium range Interceptor missile system with the existing "Kill Chain" C2 architecture. This capability will be designed to be effective against rockets, Group 3+ Unmanned Aerial Systems, mortars, lower end cruise missiles, precision guided missiles and rotary wing/fixed wing aircraft. ***FY 2019 OCO Plans:*** -$12.390M provides for the rapid prototyping of equipment by pursuing advanced technology solutions in order to support critical emergent CENTCOM warfighting requirements identified in JUONS #CC-0558. Funding will purchase Coyote multi-mission C-UAS drone launchers, C-UAS Component Integration Kits for the Joint Lightweight Tactical Vehicle (JLTV) and a C-UAS C2 Network. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The $43.894M increase from FY18 to FY19 in baseline funding reflects the Marine Corps continued urgent need to address emergent war fighting requirements for a GBAD Future Weapons System and the Commandant of the Marine Corp (CMC) directed Counter-UAS (C-UAS) assessment, engineering and acquisition efforts to determine and pursue technology solutions required to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission. Efforts include assessment, engineering analysis and prototype procurement necessary to evaluate various direct energy, electronic attack, missile and projectile capabilities to determine the right mix of technologies required to negate aerial threats and provide the MAGTF, as well as, Bases, Posts and Stations, Force Protection against such threats. With the proliferation of both military and commercial UAS platforms, the program will pursue and acquire GBAD-FWS platforms with a C-UAS capability.					
Title: GBAD FWS/COUNTER UAS: Support Costs	3.880	1.660	2.872	3.740	6.612
Articles:	-	-	-	-	-
Description: The Government Technical Support Team provides inherently governmental support functions adding depth, breath and expertise not resident in the GBAD Program Office. Functions include technical planning, execution and analysis across multi-disciplinary competencies to include; Systems Architecture, Radar/Jamming Software Engineering, Radar/Jamming Systems Engineering, Cyber Security/Information Assurance, Human Systems Integration, Safety, Configuration Management and the coordination necessary to enable a System of Systems interface with other programs in the "Cue to Slew" kill chain to ensure platform/ software compatibility. Technical Team support is vital in providing both studies and analysis during the Systems Development and Demonstration phase.					
FY 2018 Plans: -Continuation of GBAD Future Weapons System and Counter UAS acquisition, engineering, and assessment efforts to determine the technology solutions required to defeat UAS threats associated with the Marine Corps Low-Altitude Air Defense mission. Includes systems engineering, safety review boards, prototype system maintenance, support and training.					
FY 2019 Base Plans: -Continuation of GBAD Future Weapons System and Counter UAS acquisition, engineering, and assessment efforts to determine the technology solutions required to defeat UAS threats associated with the Marine Corps Low-Altitude Air Defense mission. Efforts focus on C-UAS prototype software load set analysis with updates to					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
address the ever evolving enemy threat and engineering efforts with lessons learned from the procurement of initial CUAS prototypes. ***FY 2019 OCO Plans:*** -$3.740M provides for the rapid prototyping of Counter UAS equipment by pursuing advanced technology solutions to support critical emergent CENTCOM warfighting requirements identified in JUONS #CC-0558. Funding supports the engineering, integration and installation of multiple C-UAS components on the Joint Lightweight Tactical Vehicle (JLTV) to include a C-UAS C2 Network System in response to the MARCENT UUNS. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Baseline funding increases $1.212M from FY18 to FY19 provides specialized Government Activity technical support not resident in the Program Office for GBAD Future Weapons System efforts focusing on C-UAS prototype software load set analysis with updates to address the ever evolving enemy threat and engineering efforts with lessons learned from the procurement of initial CUAS prototypes.					
Title: GBAD FWS/COUNTER UAS: Test and Evaluation	0.000	0.000	5.471	0.000	5.471
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Initiates GBAD Future Weapons System Test and Evaluation of C-UAS Systems Soft-Kill and Hard-Kill prototypes integrated on both M-ATV's and JLTV's. Testing locations include Yuma Proving Grounds AZ, Crane IN and Quantico VA. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** An increase of $5.471M supports Test and Evaluation of C-UAS Systems Soft-Kill and Hard-Kill prototypes integrated on both M-ATV's and JLTV's.					
Title: GBAD FWS/COUNTER UAS: Program Management Support	2.156	1.202	1.394	0.000	1.394
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Continuation of GBAD Future Weapons System and Counter UAS acquisition documentation to include continued Analysis of Alternative (AoA) studies, completion of the GBAD-FWS Acquisition Strategy and Acquisition Plan, and the completion of the GBAD FWS CDD necessary to support new technology solutions required to defeat the full spectrum or threats associated with the Marine Corps Low-Altitude Air Defense mission. ***FY 2019 Base Plans:*** - Continues GBAD Future Weapons System acquisition documentation to include the initiation of the Independent Logistics Assessment (ILA) Report, the Fielding Plan, the Life Cycle Sustainment Plan, Technical Manuals and the Programmatic Environmental Safety and Occupational Health Evaluation (PESHE) which are all required documentation to support new technology solutions required to defeat the full spectrum or threats associated with the Marine Corps Low-Altitude Air Defense mission. ***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	45.058	24.214	73.605	16.130	89.735

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/3006: *GBAD*	9.170	9.432	18.334	-	18.334	176.521	197.877	226.815	219.396	21.675	963.646

Remarks

D. Acquisition Strategy

GBAD-Stinger Sustainment: A-MANPADS Increment I is an Abbreviated Acquisition Program (AAP), GBAD-SS enables the rapid transition from the Avenger/MANPADS weapon system to the more mobile, flexible and maintainable Advanced MANPADS to a Maneuver-Short Range Air Defense (M-SHORAD) capability with JLTV integration design and engineering efforts beginning in FY19. The AAP is principally comprised of integrating Government Off The Shelf (GOTS) equipment and Non-Developmental Items (NDI).

GBAD Future Weapons System: The GBAD Program is rapidly approaching the out of production phase for the A-MANPADS Increment I and the end of life for the Stinger missile. The Stinger missile is reliable but older technology, while it remains relevant in the near-term, the GBAD Program is planning for a GBAD Future

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

Weapon System to address a larger array of targets utilizing organic C2 and sensor systems. Leveraging an update to the Analysis of Alternatives (AoA) completed Sept 2016, the Marine Air Defense Integrated System (MADIS) Capability Development Document (CDD) is anticipated in the 4th quarter FY18. The GBAD Future Weapons System will consist of a multiple weapons system platforms to defeat current and emerging threats for UAS, FW/RW aircraft, and cruise missiles.

E. Performance Metrics

Integrated Master Schedule
OSD Financial Benchmarks
Technical Performance Measures
Probability of Program Success (PoPS) Assessments

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons 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
GBAD-SS	WR	NSWC : Dahlgren, VA	0.697	0.110	Dec 2016	0.356	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
GBAD-SS	WR	NSWC : Crane.IN	4.590	0.411	Dec 2016	0.421	Nov 2017	1.905	Dec 2018	-		1.905	Continuing	Continuing	Continuing
GBAD-SS	Various	VARIOUS : VARIOUS	6.865	0.495	Jul 2017	0.643	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
GBAD FWS/Counter UAS	MIPR	CTTSO : Washington, DC	0.000	14.265	Jun 2017	1.528	Jan 2018	0.000		-		0.000	0.000	15.793	-
GBAD FWS/Counter UAS	MIPR	DOTC : Picatinny, NJ	0.000	14.090	Jun 2017	16.541	Feb 2018	2.992	Mar 2019	-		2.992	0.000	33.623	-
GBAD FWS/Counter UAS	Various	DLA : Ft Belovoir VA	0.000	0.000		0.000		36.236	Mar 2019	-		36.236	0.000	36.236	-
GBAD FWS/Counter UAS	Various	VARIOUS : VARIOUS	0.000	8.872	Jul 2017	0.000		0.003	Dec 2018	-		0.003	0.000	8.875	-
GBAD FWS/Counter UAS	Various	CRAM : Redstone Arsenal, AL	0.000	0.000		0.000		12.911	Dec 2018	-		12.911	0.000	12.911	-
GBAD FWS/Counter UAS	Various	NSWC : Crane.IN	0.000	0.000		0.000		9.821	Dec 2018	-		9.821	0.000	9.821	-
GBAD FWS/Counter UAS	Various	Not Specified : Not Specified	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
GBAD Counter UAS OCO	Various	CRAM : Redstone Arsenal, AL	0.000	0.000		0.000		0.000		8.260	Feb 2019	8.260	0.000	8.260	-
GBAD Counter UAS OCO	Various	NSWC : Crane.IN	0.000	0.000		0.000		0.000		4.130	Dec 2018	4.130	0.000	4.130	-
Prior Years Cumulative Funding	Various	N/A : N/A	15.932	0.000		0.000		0.000		-		0.000	0.000	15.932	-
		Subtotal	28.084	38.243		19.489		63.868		12.390		76.258	Continuing	Continuing	N/A

Remarks

GBAD-SS increases $.485M from FY18 to FY19 to support the system's design and engineering efforts associated with equipment integration onto a JLTV platform to provide a Maneuver-Short Range Air Defense (M-SHORAD) capability.

Overall, GBAD FWS/Counter UAS funding increases $56.284M, from FY18 to FY19 to include both baseline and OCO funding, as the Government continues to procure both "Soft-Kill and "Hard- Kill" C-UAS prototype equipment. Funding will purchase Coyote multi-mission C-UAS drone launchers, a C-UAS C2 Network and C-UAS Component Integration Kits for both the Mine Resistant Ambush Protected-All Terrain Vehicle (M-ATV) and the Joint Lightweight Tactical Vehicle (JLTV).

FY19 GBAD Counter UAS OCO funding provides $12.390M for the rapid prototyping of equipment by pursuing advanced technology solutions in order to support critical emergent CENTCOM warfighting requirements identified in Marine Corps UUNS #15205UA, and JUONS #CC-0558. Funding will procure Coyote multi-mission C-UAS drone launchers, C-UAS Component Integration Kits for the JLTV and a CUAS C2 Network.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons 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
GBAD-SS	WR	NSWC : Crane, IN	2.644	0.364	Dec 2016	0.366	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
GBAD-SS	Various	VARIOUS : VARIOUS	0.000	0.000		0.096	Dec 2017	0.000		-		0.000	0.000	0.096	-
GBAD FWS/Counter UAS	Various	NSWC : Dahlgren	0.000	3.880	Apr 2017	1.660	Dec 2017	1.703	Dec 2018	-		1.703	0.000	7.243	-
GBAD FWS/Counter UAS	Various	VARIOUS : VARIOUS	0.000	0.000		0.000		1.169	Dec 2018	-		1.169	0.000	1.169	-
GBAD Counter UAS OCO	WR	NSWC : Crane, IN	0.000	0.000		0.000		0.000		3.740	Dec 2018	3.740	0.000	3.740	-
Prior Years Cumulative Funding	Various	N/A : N/A	4.388	0.000		0.000		0.000		-		0.000	0.000	4.388	-
		Subtotal	7.032	4.244		2.122		2.872		3.740		6.612	Continuing	Continuing	N/A

Remarks

GBAD FWS/Counter UAS increases $4.490M from FY18 to FY19, to include both baseline and OCO funding, providing specialized Government Activity technical support not resident in the Program Office for C-UAS prototype software load set analysis to address the ever evolving enemy threat, technical studies for integrating C2 with C-UAS weapon systems and supporting systems design, engineering efforts with lessons learned from the procurement of initial C-UAS prototypes support and the engineering, integration and installation of multiple C-UAS components to include a C-UAS C2 Network on the Joint Lightweight Tactical Vehicle (JLTV) in support of the MARCENT UUNS.

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
GBAD FWS/Counter UAS	Various	VARIOUS : VARIOUS	0.000	0.000		0.000		5.471	Dec 2018	-		5.471	0.000	5.471	-
GBAD-SS	MIPR	NSWC Crane : Crane, IN	1.104	0.125	Mar 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
GBAD-SS	MIPR	ARMY : VARIOUS	0.000	0.050	Aug 2017	0.737	Nov 2017	0.000		-		0.000	0.000	0.787	-
Prior Years Cumulative Funding	Various	N/A : N/A	4.994	0.000		0.000		0.000		-		0.000	0.000	4.994	-
		Subtotal	6.098	0.175		0.737		5.471		-		5.471	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2278 / *Air Defense Weapons 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

Remarks

Funding increases $4.734M from FY18 to FY19 to support the Test and Evaluation of C-UAS Systems Soft-Kill and Hard-Kill prototypes integrated on both M-ATV's and JLTV's. Testing locations include Yuma Proving Grounds AZ, Crane IN and Quantico VA.

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
GBAD-SS	C/FP	MCSC : Quantico, VA	2.965	0.050	Jul 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
GBAD-SS	Various	MCSC Travel : Quantico, VA	0.198	0.100	Sep 2017	0.098	Sep 2018	0.000		-		0.000	Continuing	Continuing	Continuing
GBAD-SS	WR	NSWC : Dahlgren, VA	0.674	0.090	Jan 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
GBAD-SS	C/FP	Alexandria Insights : Quantico, VA	0.000	0.000		0.566	Dec 2017	0.000		-		0.000	0.000	0.566	-
GBAD FWS/COUNTER UAS	C/FP	Alexandria Insights : Quantico, VA	0.000	2.156	Dec 2016	1.202	Dec 2017	1.394	Dec 2018	-		1.394	0.000	4.752	-
Prior Years Cumulative Funding	Various	N/A : N/A	1.318	0.000		0.000		0.000		-		0.000	0.000	1.318	-
		Subtotal	5.155	2.396		1.866		1.394		-		1.394	Continuing	Continuing	N/A

Remarks

-Alexandria Insights funding increases ($0.192) from FY18 to FY19 to initiate GBAD FWS logistics documentation efforts to include the Independent Logistics Assessment (ILA) Report, the Fielding Plan, and the Life Cycle Sustainment Plan.

	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	46.369	45.058		24.214		73.605		16.130		89.735	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2278 / *Air Defense Weapons System*	

	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

Overall, the Air Defense Weapons System $65.521M increase from FY18 to FY19, in combined baseline and OCO funding, reflects the Marine Corps continued urgent need to address emergency war fighting requirements for a Ground Based Air Defense (GBAD) Future Weapons System (FWS) and the Commandant of the Marine Corp (CMC) directed Counter-UAS (C-UAS) assessment, engineering and acquisition efforts to determine and pursue technology solutions required to defeat the full spectrum of threats associated with the Marine Corps Low-Altitude Air Defense mission.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

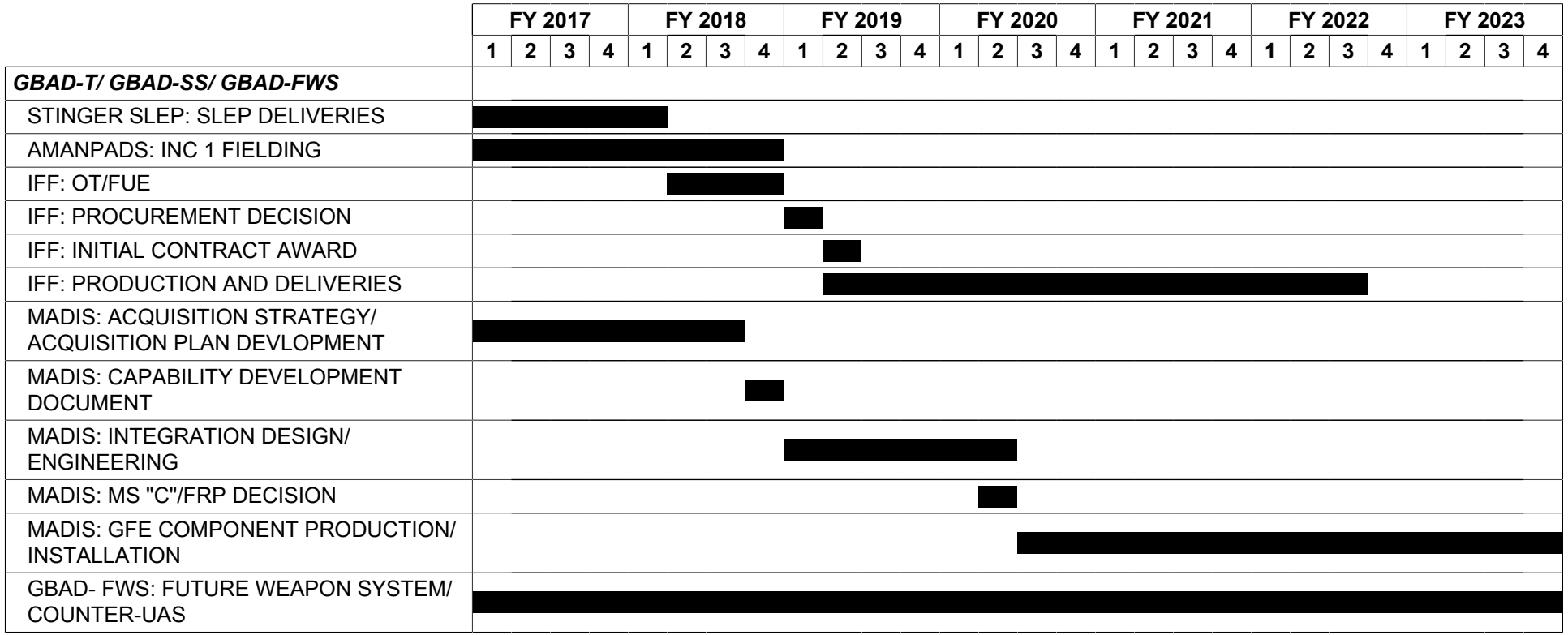


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2278 / *Air Defense Weapons System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
GBAD-T/ GBAD-SS/ GBAD-FWS				
STINGER SLEP: SLEP DELIVERIES	1	2017	1	2018
AMANPADS: INC 1 FIELDING	1	2017	4	2018
IFF: OT/FUE	2	2018	4	2018
IFF: PROCUREMENT DECISION	1	2019	1	2019
IFF: INITIAL CONTRACT AWARD	2	2019	2	2019
IFF: PRODUCTION AND DELIVERIES	2	2019	3	2022
MADIS: ACQUISITION STRATEGY/ACQUISITION PLAN DEVLOPMENT	1	2017	3	2018
MADIS: CAPABILITY DEVELOPMENT DOCUMENT	4	2018	4	2018
MADIS: INTEGRATION DESIGN/ ENGINEERING	1	2019	2	2020
MADIS: MS "C"/FRP DECISION	2	2020	2	2020
MADIS: GFE COMPONENT PRODUCTION/ INSTALLATION	3	2020	4	2023
GBAD- FWS: FUTURE WEAPON SYSTEM/ COUNTER-UAS	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*				Project (Number/Name) 2510 / *MAGTF CSSE & SE*			
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**
2510: *MAGTF CSSE & SE*	294.532	5.501	1.518	1.307	-	1.307	2.310	1.468	1.486	1.520	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

(U) The Marine Air Ground Task Force (MAGTF) Combat Service Support Element & Supporting Establishment (CSSE & SE) consists of mutually supporting Logistics Information Technology (IT) programs that support force deployment, planning, and execution; sustainment and distribution; and contributes to the Combatant Commander's Common Operating Picture to support rapid accurate decision making.

JOINT FORCE REQUIREMENTS GENERATOR II (JFRG II)) is an Automated Information System (AIS) that provides the Marine Corps' the capability to plan and execute strategic force deployments in support of Joint contingency and crisis action operations and plans. It serves as the single link between Service operational force requirements and validated/sourced unit personnel and cargo data. JFRG II permits multi-level planning with entry of equipment and personnel data, transportation/ movement data, and the phasing of the total force throughout the entire movement timeline. JFRG II interfaces with the Joint Operation Planning and Execution System (JOPES) to register update and validate Time Phased Force and Deployment Data (TPFDD) within the Department of Defense chain of command. Validated deployment information is then used by U.S. Transportation Command for the scheduling of strategic transportation assets. JFRG II interfaces with the MAGTF Deployment Support System II (MDSS II) for unit cargo information and the War Reserve System (WRS) in order to register sustainment requirements. JFRG II can generate standard, executive, and ad hoc reports and perform database queries to support information requirements. JFRG II operates and functions in a classified environment.

BASE TELECOMMUNICATIONS INFRASTRUCTURE (BTI) provides all Marine Corps installations with the base area network
communications infrastructure that connects the end-user to the DISA network. BTI modernizes, sustains, upgrades and enhances the telecommunications systems infrastructure for all Marine Corps Installations in order to meet the demands required to support the 5th Element of the Marine Air Ground Task Force (MAGTF).
BTI is designed to maintain current industry standards as they relate to technological capabilities for all voice, video and data services and are transported via each installation's infrastructure. These data services include, support for but are not limited to: Enhanced 911 (E911), Video-Teleconferencing, Integrated Services Digital Network, Marine Corps Enterprise Network, Energy Monitoring Control Systems, Intrusion Detection Systems, Access Control Systems, Fire Alarm Control Networks and Fleet Training Systems. This includes supporting systems such as optical networks, telecommunications management systems, primary power, voice mail, teleconferencing, and outside plant infrastructure. The ongoing focus is technology refresh and standardization on DISA Unified Capabilities (UC) (voice, video, collaboration, and data)
through modernization of installation infrastructure in order to maintain connection to the DISA network.

ENTERPRISE LOGISTICS SUPPORT SYSTEMS (ELS2): Provides funding that supports the USMC Deployment and Execution Support Systems and the Distribution Management Support Systems, and fair share cost to the joint program management office systems. These systems and applications support the planning, deployment, distribution, sustainment and redeployment of supplies, equipment and personnel. The ELS2 applications utilize Automated Information Technology (AIT) read/write devices, active radio frequency identification (aRFID) tags and satellite tracking systems. ELS2 applications support In-Transit Visibility (ITV) and Total Asset Visibility

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

(TAV) initiatives to provide commanders with timely and accurate near real-time data on the location and movement of personnel, equipment and supplies that are in-process, in-transit and in-theater. This developmental effort completed in FY17 and requires no FY18 funding.

MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2): Composed of several main components including the Electronic Maintenance Support System (EMSS). EMSS is a rugged organizational-level (O-level), light-weight, one-man portable maintenance device capable of supporting multiple platforms and systems across maintenance communities. It provides a Commercial Off-The-Shelf (COTS) hardware device equipped with Built-In-Test/Built-In-Test Equipment (BIT/BITE) interfaces, and Software Defined Test Instrument (SDTI) General Purpose Electronic Test Equipment (GPETE) capabilities. These hardware capabilities will enable commercial or custom DoD and USMC software capabilities including Interactive Electronic Technical Manuals (IETMs), Computer Based Training (CBT), and other maintenance applications to be hosted on EMSS. EMSS also has the capability to connect to the Marine Corps Enterprise Network (MCEN) and access sites like Global Combat Support System - Marine Corps (GCSS-MC) in order to facilitate maintenance and supply transactions, thereby improving readiness. With these capabilities, maintainers will make more informed decisions and sustain force readiness over time.

GLOBAL COMBAT SUPPORT SYSTEM-MARINE CORPS, (GCSS-MC)/Logistics Chain Management (LCM) is the implementation of the enterprise Information Technology (IT) architecture designed to support both improved and enhanced Marine Air Ground Task Force (MAGTF) Combat Support Services (CSS) functions and MAGTF Commander and Combatant Commanders/Joint Task Force (CC/JTF) combat support information requirements. The primary goal of GCSS-MC/LCM is to provide the capabilities specified in the Logistics Operational Architecture (Log OA). The result of enabling the Log OA is the retirement of logistics applications. GCSS-MC/LCM exposes timely mission information to Marine Corps operational and CSS commanders, CC/JTF commanders and their staffs and other authorized users. It exposes information interoperability and common logistics information applications and services across functional areas. GCSS-MC/LCM is an enabler that allows operating forces commanders to base decisions on complete logistics information and make decisions in concert with specific operational tasks. Other follow-on functionalities can be invoked if affordable and when defined by the problem statements.
Funding in GCSS-MC/LCM RDT&E PE 0206313M/Project 2510 transitioned to PE 0219902M/Project 5503 commencing in FY17.

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 FORCES REQUIREMENT GENERATION II (JFRG II)	0.193	0.206	0.197	0.000	0.197
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete preparation of MCEITS Hosting environment.					
FY 2019 Base Plans: -Continue Engineering Change Proposals (ECPs).					
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 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
No significant change from FY 2018 to FY 2019.					
Title: BASE TELECOM (BTI) ***Articles:*** ***FY 2018 Plans:*** Continue test and evaluation (T&E) engineering support for Defense Information Systems Agency (DISA) Unified Capabilities (UC) (voice, video, collaboration, and data) implementation. ***FY 2019 Base Plans:*** Continue test and evaluation (T&E) engineering support for Defense Information Systems Agency (DISA) Unified Capabilities (UC) (voice, video, collaboration, and data) implementation. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.	0.475 -	0.500 -	0.458 -	0.000 -	0.458 -
Title: Global Combat Support System - Marine Corps ***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 significant change from FY 2018 to FY 2019.	3.248 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: ENTERPRISE LOGISTICS SUPPORT SYSTEMS (ELS2) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:***	1.045 -	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 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

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 significant change from FY 2018 to FY 2019.					
Title: MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2) ***Articles:*** ***FY 2018 Plans:*** -Continue efforts to investigate software defined test instruments (SDTI) and software applications for the Health Management System (formerly called Next Generation Operation Management Systems). Effort will be completed in FY18. -Continue to investigate advanced Interactive Electronic Technical Manual software to incorporate advanced diagnostics. Effort will be completed in FY18. -Continue information security and interoperability testing/certification. Effort will be completed in FY18. -Continue software applications which support enhanced maintenance capabilities on existing weapon system platforms. Effort will be completed in FY18. -Continue efforts to evaluate downsized testers for tablet applications. Effort will be completed in FY18. -Continue efforts to investigate instrument modules for on system testing. Effort will be completed in FY18. -Initiate efforts to develop Wireless Access Module (WAM) of host application to maintenance platform tools for the following MOSs: AAV mechanics, Tank mechanics, Motor-T mechanics, LAV mechanics, and Heavy Equipment mechanics. ***FY 2019 Base Plans:*** - Continue to develop WAM prototypes in order to enable organic level maintenance on LAV, Tank, AAV, and Heavy Equipment weapon systems. - Initiate efforts to develop software applications for the Health Management System (HMS) in order to push and pull data, conduct software configuration management, and generate maintenance reports.	0.540 -	0.812 -	0.652 -	0.000 -	0.652 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate efforts to develop government off the shelf (GOTS) diagnostic software capabilities for Heavy Equipment and Motor Transport weapon systems in order to decrease their life cycle costs. ***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	5.501	1.518	1.307	0.000	1.307

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/BLI 463500 BTI: *BTI*	16.930	32.893	54.349	-	54.349	23.196	54.429	57.995	67.721	Continuing	Continuing
• PMC/BLI 418100: *MAGTF Logistics Support Systems*	3.364	11.263	10.453	-	10.453	10.616	12.418	12.536	12.590	Continuing	Continuing
• PMC/BLI 462000: *TSP/Enterprise Logistics Support Systems*	0.594	0.253	0.259	-	0.259	0.264	0.269	0.275	0.281	Continuing	Continuing

Remarks

D. Acquisition Strategy

JOINT FORCES REQUIREMENT GENERATOR II (JFRG II) is required to modernize in order to implement Joint Requirements Oversight Counsel (JROC) mandates in support of Adaptive Planning and Execution (APEX) including the inclusion of Global Force Management - Data Initiative (GFM-DI) data elements and Joint Command and Control (JC2) Capabilities Development Document (CDD) requirements. The JFRG II legacy software application will remain supported until end of life (EOL) in FY18 when it will be replaced by the modernized version. Future capability improvements as identified in the JC2 CDD will be implemented through the configuration management process.

BASE TELECOMMUNICATIONS INFRASTRUCTURE (BTI) provides all Marine Corps installations with the base area network communications infrastructure that connects the end-user to the DISA network. BTI modernizes, sustains, upgrades and enhances the telecommunications systems infrastructure for all Marine Corps Installations in order to meet the demands required to support the 5th Element of the Marine Air Ground Task Force (MAGTF). Participation in the DISA Unified Capabilities Master Plan (voice, video, collaboration, and data) is critical to BTI modernization strategy. The RDT&E funds will be utilized for analysis, research and evaluation of Unified Capabilities (UC) (voice, video, collaboration, and data) implementation efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

ENTERPRISE LOGISTICS SUPPORT SYSTEM (ELS2): The acquisition strategy is to develop the functional elements of the MAGTF Deployment Support System II (MDSS II) into a Sea Service Deployment Module (SSDM) of the Integrated Computerized Deployment System (ICODES). ICODES is a Joint Program currently managed by the Surface Deployment and Distribution Command (SDDC) of USTRANSCOM. The development of the SSDM was instituted as a CLIN to the SDDC JPMO contract for ICODES awarded in December 2015. The development will follow an evolutionary acquisition approach that allows for continued development based on functional transition and changing user need requirements as well as information assurance requirements. The JPMO will determine the contracting strategy and this PMO will acknowledge and approve strategies prior to funding development.

MAGTF LOGISTICS SUPPORT SYSTEMS (MLS2) is pursuing an evolutionary acquisition strategy in order to sustain operationally suitable and supportable capability across the Marine Corps as a maintenance aid. Electronic Maintenance Support Systems must evolve in concert with the supported platforms maintenance philosophy to provide extended functionality and access to network connectivity.

Global Combat Support System- Marine Corps (GCSS-MC): The acquisition strategy is to 'embrace and replace' existing logistics information systems. Using the capabilities provided by GCSS-MC/LCM Increment 1, PMW 230 (PM for GCSS-MC) will embrace existing logistics information systems or replace them as appropriate with modern enabling technology that meets the requirements of the Business Case Analysis(s) (BCAs).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 2510 / *MAGTF CSSE & SE*	

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
JFRG II	C/IDIQ	SAIC : Stafford, VA	2.293	0.000		0.206	Jan 2018	0.197	Jan 2019	-		0.197	Continuing	Continuing	Continuing
ELS2 -ICODES Development	C/CPFF	USTRANSCOM JPMO : SCOTT AFB, IL	4.250	1.045	Jan 2018	0.000		0.000		-		0.000	0.000	5.295	-
EMSS/MAGTF Logistics Support Systems	WR	NSWC, Crane : Crane, IN	0.000	0.540	Jan 2017	0.203	Feb 2018	0.652	Feb 2019	-		0.652	0.000	1.395	-
Prior Years Cumulative Funding	Various	Various : Various	277.958	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	284.501	1.585		0.409		0.849		-		0.849	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
EMSS/MAGTF Logistics Support Systems Program SW Support	C/FFP	Various : Various	0.846	0.000		0.609	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	Various : Various	4.120	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
GCSS-CM R-12 Implementation Support	SS/FFP	Leidos : Various	0.000	3.248	Nov 2016	0.000		0.000		-		0.000	0.000	3.248	-
		Subtotal	4.966	3.248		0.609		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
JFRG	C/IDIQ	SAIC : Stafford, VA	0.190	0.193	Jan 2018	0.000		0.000		-		0.000	0.000	0.383	-
BTI	MIPR	MITRE : Aberdeen Proving Ground, MD	1.115	0.475	Jan 2017	0.500	Jan 2018	0.458	Jan 2019	-		0.458	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

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 Years Cumulative Funding	Various	Various : Various	3.760	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	5.065	0.668		0.500		0.458		-		0.458	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	294.532	5.501		1.518		1.307		-		1.307	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

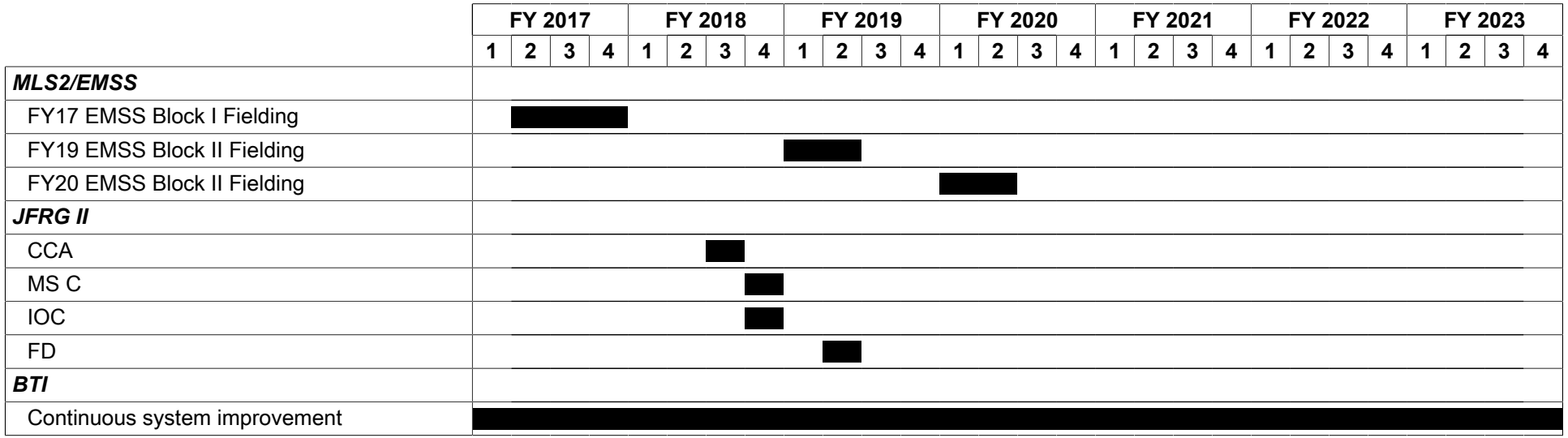


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MLS2/EMSS				
FY17 EMSS Block I Fielding	2	2017	4	2017
FY19 EMSS Block II Fielding	1	2019	2	2019
FY20 EMSS Block II Fielding	1	2020	2	2020
JFRG II				
CCA	3	2018	3	2018
MS C	4	2018	4	2018
IOC	4	2018	4	2018
FD	2	2019	2	2019
BTI				
Continuous system improvement	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3099 / *Radar 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
3099: *Radar System*	180.131	11.729	14.015	16.435	-	16.435	20.977	18.756	18.623	13.921	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems to project 3773 Fire Coordination and Sensors. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

NOTE: The FY 2019 funding request was reduced by $9.553M to account for the availability of prior year execution balances.

Increase of $2.620M from FY18 to FY19 supports enhanced software development for AN/TPS-59 Tactical Ballistic Missile (TBM) detection as well as enhanced data analysis and engineering modeling of threat profiles to support the TBM software enhancements.

A. Mission Description and Budget Item Justification

Long Range Radar (AN/TPS-59) - The AN/TPS-59A(V)3 is a transportable, three dimensional, tactical radar system that provides the Marine Air Ground Task Force (MAGTF) with long-range surveillance. It is the MAGTF's only ground based long range sensor that provides the capability to detect and report Air Breathing Targets (ABT) and track Theater Ballistic Missiles (TBM). The AN/TPS-59A(V)3 Radar System is connected to the Common Aviation Command and Control Systems (CAC2S). It provides the air defense controllers data and may be used autonomously to conduct Ground Control Intercept, tactical en-route Air Traffic Control (ATC), or TBM alert operations via the Joint Integrated Air Missile Defense (IAMD) encrypted Link-16. The USMC extended the AN/TPS-59 service life through 2035; therefore, in order to maintain its operational relevance on the battlefield, a number of modernization efforts are initiated starting in FY17. The Digital Receiver and Exciter (DREX) upgrade will convert the analog receivers and exciters to digital to address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues, enable spectral agility, reduce noise, reduce false alarms, and enhance Electronic Counter-Countermeasures (ECCM) capability. This effort will include an essential simulation and test environment capability.

Family of Target Acquisition Systems (FTAS) - The FTAS provides the MAGTF the capability to locate, identify, and attack enemy indirect fire weapons systems and observe and direct friendly artillery fire. The FTAS consists of the AN/TPQ-46 Firefinder Radar, the AN/TPQ-49 Lightweight Counter Mortar Radar, and the AN/TSQ-267 Target Processing Set. The FTAS is critical in the execution of counterfire and the integration of target acquisition information enabling attack by MAGTF assets. The FTAS also provides artillery firing units the ability to conduct artillery registration and other friendly fire missions. The FTAS encompasses the equipment required to support target acquisition within the target acquisition platoon and is resident in the headquarters battery of each artillery regiment. The program will continue to address system issues that arise due to DMSMS items within the FTAS. The USMC assumed the role of Primary Inventory Control Activity (PICA) for the AN/TPQ-49 in FY15 when the Army divested itself from the system. FTAS transitions from Project C3099 to C3773 beginning in FY19.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

Short/Medium Range Air Defense Radar (AN/TPS-63 or SHORAD) - The AN/TPS-63 is a two-dimensional, medium-range, medium altitude, transportable radar system, which is doctrinally employed as a tactical gap-filler or as an early warning system for early deployment into the operational area. It has a 360-degree air surveillance capability at a range of 160 miles and complements the co-employed AN/TPS-59 three-dimensional, long-range, air surveillance radar system. The program will use Other Government Agencies (OGAs) to develop engineering change proposals related to DMSMS for improved system reliability with the specific purpose of meeting increased fleet operational requirements. This system will be replaced by Ground/Air Task Oriented Radar (G/ATOR AN/TPS-80).

Virtual Warfare Center (VWC) Support - The project team conducts fully interactive simulated war games at the Virtual Warfare Center (VWC) in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the Integrated Air and Missile Defense (IAMD) mission area. The VWC provides a venue for the exploration of advanced engagement concepts focused on persistent forward naval engagements in support of the MAGTF and the development of associated Joint and Service specific tactics, techniques, and procedures (TTPs). 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.

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/TPS-59: Product Development	6.383	6.628	7.736	0.000	7.736
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue product development for Digital Receiver and Exciter (DREX) which is critical to address congested spectral environment and enable all future enhancements to include Tactical Ballistic Missile (TBM). -Initiate Digital Receiver and Exciter (DREX) Engineering Design Model (EDM).					
FY 2019 Base Plans: -Continue enhanced software development for Tactical Ballistic Missile (TBM) detection. -Continue DREX Engineering Design Model (EDM) Development.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Increase of $1.108M from FY18 to FY19 supports enhanced software development for Tactical Ballistic Missile (TBM) detection.					
Title: AN/TPS-59: Support	1.259	3.823	4.275	0.000	4.275
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue Developmental Engineering Support for Mode 5 Level 1 (M5L1) Software Enhancement.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar 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 developmental engineering support for Digital Receiver and Exciter (DREX) and initiate developmental engineering support for Array Erection. -Initiate Identification Friend or Foe (IFF) testing support. ***FY 2019 Base Plans:*** -Initiate test and evaluation support for Digital Receiver and Exciter (DREX). -Continue developmental engineering support for DREX. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $.452M from FY18 to FY19 will fund Government Furnished Equipment for the Test Array located at the Original Equipment Manufacturer (OEM).					
Title: AN/TPS-59: Test and Evaluation	0.000	0.340	1.396	0.000	1.396
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue Blackdart and Boldquest Testing Support, Mode 5 Level 1 (M5L1) Testing, and System of System Modernization Testing. -Continue Moving Target Generator testing which will drastically reduce future test costs for Tactical Ballistic Missile (TBM) testing and System of System Capability testing. -Initiate Identify Friend or Foe (IFF) Testing. ***FY 2019 Base Plans:*** -Initiate test and evaluation of the Digital Receiver and Exciter (DREX) Engineering Design Module (EDM). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $1.056M from FY18 to FY19 will support Test and Evaluation of the Digital Receiver and Exciter (DREX) Engineering Design Module (EDM).					
Title: AN/TPS-59: Management Services	0.000	0.000	1.900	0.000	1.900
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar 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 ***FY 2019 Base Plans:*** -Initiate support from MITRE for enhanced data analysis and engineering modeling of threat profiles to support the tactical ballistic missile software enhancements and current operational threats. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $1.900M from FY18 to FY19 will support enhanced data analysis and engineering modeling of threat profiles to support the tactical ballistic missile software enhancements and current operational threats.					
Title: FTAS: Product Development ***Articles:*** ***FY 2018 Plans:*** -Initiate development of Lightweight Counter Mortar Radar (LCMR) tech refresh system. -Initiate development of the Target Processing System (TPS) Kits for use within the Mobile Tactical Shelter (MTS). ***FY 2019 Base Plans:*** -See Project C3773. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.246M is due to realignment from Project C3099 to C3773. Realignment of effort to new Project in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.	0.448 -	1.246 -	0.000 -	0.000 -	0.000 -
Title: FTAS: Support ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:***	0.369 -	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 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar 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 ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No change from FY 2018 to FY 2019.					
Title: FTAS: Test and Evalution ***Articles:*** ***FY 2018 Plans:*** -Continue interoperability testing for the Family of Target Acquisition Systems (FTAS) integration within the Marine Air-Ground Task Force (MAGTF). ***FY 2019 Base Plans:*** -See Project C3773. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems to project 3773 Fire Coordination and Sensors.	0.680 -	0.391 -	0.000 -	0.000 -	0.000 -
Title: AN/TPS-63 (SHORAD): Support ***Articles:*** ***FY 2018 Plans:*** -Complete ECP Development Support at OGAs. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Completed ECP Development Support at OGAs.	0.000 -	0.198 -	0.000 -	0.000 -	0.000 -
Title: VWC: Test and Evaluation	0.000	0.444	0.315	0.000	0.315

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar 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 to simulate war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area. ***FY 2019 Base Plans:*** -Continue to simulate war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: VWC: Support	2.590	0.945	0.813	0.000	0.813
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to simulate war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area. ***FY 2019 Base Plans:*** -Continue to simulate war games at the VWC in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the IAMD mission area. ***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	11.729	14.015	16.435	0.000	16.435

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/465003: *AN/TPS-59*	14.076	8.956	6.694	-	6.694	10.460	12.265	16.140	16.473	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

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/465005: *FTAS*	2.984	2.735	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	31.876
• PMC/465007: *SHORAD (AN/TPS-63)*	0.267	0.720	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.167
• PMC/463000: *AN/TPS-59 MCHS*	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.314
• RDTE/CC284: *AN/TPS-59 Radar Enhancements*	11.606	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	24.158
• RDTE/C3773: *FTAS*	0.000	0.000	1.626	-	1.626	1.629	1.660	1.687	1.721	0.000	8.323
• PMC/473300: *FTAS*	0.000	0.000	2.867	-	2.867	2.947	3.005	3.065	3.126	Continuing	Continuing

Remarks

FTAS RDTE transitions from Project C3099 to C3773 in FY19.

D. Acquisition Strategy

Long Range Radar (AN/TPS-59) - Due to the proprietary nature of the software, the AN/TPS-59 Program will utilize a sole source contract with the OEM for software and Digital Receiver and Exciter development. The AN/TPS-59 Program will utilize full and open competition to the max extent possible on areas that do not have proprietary restrictions.

Family of Target Acquisition Systems (FTAS) - The Family of Target Acquisition Systems consists of 3 major components: AN/TPQ-46, AN/TPQ-49 and the AN/TSQ-267. Of these 3 systems, the AN/TPQ-46 is due to be replaced by the Ground/Air Task Oriented Radar (G/ATOR) beginning in 2019. Sustainment activities during 2016 and beyond will be limited to maintain the authority to operate (ATO) creditation. Sustainment activities on the AN/TPQ-49 are escalating due to the fact the US Army divested from the AN/TPQ-49, the USMC has assumed the responsibilities of the primary inventory control activity (PICA). Program Office will conduct an engineering change to the AN/TPQ-49 to provide the operating forces with a mobile, stand-alone configuration. Sustainment activities on the AN/TPQ-46 will begin to escalate due to the US Army divestiture from the AN/TPQ-36. The USMC will assume some sustainment responsibilities for the AN/TPQ-46 until replaced by G/ATOR. Additionally, the AN/TSQ-267 requires hardware updates in order to continue housing the suite of equipment that supports the Target Processing Center (TPC) activities.

Short/Medium Range Air Defense Radar (AN/TPS-63 or SHORAD) - The AN/TPS-63 is currently in disposal.

Virtual Warfare Center (VWC) Support - The project team conducts fully interactive simulated war games at the Virtual Warfare Center (VWC) in St. Louis, MO, in order to quantify family of systems performance and how it impacts effectiveness in the Integrated Air and Missile Defense (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. The Office of Naval Research (ONR) is the lead for all VWC contracting actions.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar 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
AN/TPS-59 - DREX EDM Development	SS/CPFF	LMC : SYRACUSE, NY	0.000	3.254	Aug 2017	4.500	Dec 2017	4.008	Dec 2018	-		4.008	0.000	11.762	-
AN/TPS-59 - Winload Test Set Development	WR	NSWC Crane : CRANE, IN	0.000	0.184	Aug 2017	0.000		0.000		-		0.000	0.000	0.184	-
AN/TPS-59 - DREX Test Enviornment	SS/CPFF	LMC : SYRACUSE, NY	0.000	0.000		2.128	Dec 2017	0.000		-		0.000	0.000	2.128	-
AN/TPS-59 DREX EDM Development Program Management	SS/CPFF	LMC : SYRACUSE, NY	0.000	1.409	Aug 2017	0.000		0.334	Sep 2019	-		0.334	0.000	1.743	-
AN/TPS-59 - UPS Development	C/FFP	NSWC Crane : CRANE, IN	0.000	0.016	Mar 2017	0.000		0.000		-		0.000	0.000	0.016	-
AN/TPS-59 - Enhanced Software Development	SS/CPFF	LMC : SYRACUSE, NY	0.000	1.426	Jun 2017	0.000		3.394	Jul 2019	-		3.394	0.000	4.820	-
AN/TPS-59 - Gearbox Mod Kit Development	WR	NSWC Crane : CRANE, IN	0.000	0.035	Feb 2017	0.000		0.000		-		0.000	0.000	0.035	-
AN/TPS-59 - IFF Antenna Development	WR	NSWC Crane : CRANE, IN	0.000	0.059	Jan 2017	0.000		0.000		-		0.000	0.000	0.059	-
FTAS	MIPR	TYAD : TOBYHANNA, PA	0.145	0.448	Mar 2017	1.246	Mar 2018	0.000		-		0.000	0.000	1.839	-
Prior Year Cumulative Funding	Various	VARIOUS : VARIOUS	84.338	0.000		0.000		0.000		-		0.000	0.000	84.338	-
		Subtotal	84.483	6.831		7.874		7.736		-		7.736	0.000	106.924	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
AN/TPS-59 - Government Engineering Support	WR	NSWC : PORT HUENEME, CA	0.866	0.000		0.000		0.615	Nov 2018	-		0.615	0.000	1.481	-
AN/TPS-59 - Engineering Support	C/FFP	NSWC : PORT HUENEME, CA	0.000	0.131	Jul 2017	0.000		0.000		-		0.000	0.000	0.131	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar 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
AN/TPS-59 - Testing Support	C/FFP	NSWC : CRANE, IN	0.000	0.094	Jul 2017	0.000		0.000		-		0.000	0.000	0.094	-
AN/TPS-59 - GFE for Test Asset	C/CPFF	LMC : SYRACUSE, NY	0.000	1.034	Aug 2017	0.000		0.770	Jul 2019	-		0.770	0.000	1.804	-
AN/TPS-59 - Engineering Support	C/FFP	MCSC : QUANTICO, VA	0.000	0.000		3.223	Nov 2017	2.890	Nov 2018	-		2.890	0.000	6.113	-
AN/TPS-59 - Array Erection Development Support	WR	NSWC : CRANE, IN	0.000	0.000		0.600	Feb 2018	0.000		-		0.000	0.000	0.600	-
FTAS	MIPR	TYAD : TOBYHANNA, PA	0.693	0.369	Mar 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
AN/TPS-63	WR	NSWC : CRANE, IN	0.130	0.000		0.198	Mar 2018	0.000		-		0.000	0.000	0.328	-
VWC	C/CPFF	ONR : ST. LOUIS, MO	17.331	2.590	Jul 2017	0.945	Feb 2018	0.813	Feb 2019	-		0.813	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	VARIOUS : VARIOUS	47.104	0.000		0.000		0.000		-		0.000	0.000	47.104	-
		Subtotal	66.124	4.218		4.966		5.088		-		5.088	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
AN/TPS-59 - DREX EDM Test & Evaluation	C/CPFF	LMC : SYRACUSE, NY	0.000	0.000		0.000		1.396	Aug 2019	-		1.396	0.000	1.396	-
AN/TPS-59 - IFF Antenna Testing	WR	NSWC : CRANE, IN	0.000	0.000		0.250	Nov 2017	0.000		-		0.000	0.000	0.250	-
AN/TPS-59 -Testing Travel	Various	VARIOUS : VARIOUS	0.000	0.000		0.090	Dec 2017	0.000		-		0.000	0.000	0.090	-
FTAS	WR	MCTSSA : SAN DIEGO, CA	0.000	0.680	Jun 2017	0.391	Feb 2018	0.000		-		0.000	0.000	1.071	-
VWC	C/CPFF	ONR : ST. LOUIS, MO	0.000	0.000		0.444	May 2018	0.315	May 2019	-		0.315	0.000	0.759	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar 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
Prior Year Cumulative Funding	Various	VARIOUS : VARIOUS	3.543	0.000		0.000		0.000		-		0.000	0.000	3.543	-
		Subtotal	3.543	0.680		1.175		1.711		-		1.711	0.000	7.109	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
AN/TPS-59 Engineering Support	MIPR	MITRE : BEDFORD, MA	0.000	0.000		0.000		1.900	Dec 2018	-		1.900	0.000	1.900	-
Prior Year Cumulative Funding	Various	VARIOUS : VARIOUS	25.981	0.000		0.000		0.000		-		0.000	0.000	25.981	-
		Subtotal	25.981	0.000		0.000		1.900		-		1.900	0.000	27.881	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	180.131	11.729		14.015		16.435		-		16.435	Continuing	Continuing	N/A

Remarks

NOTE: Increase of $2.420M from FY18 to FY19 supports enhanced software development for AN/TPS-59 Tactical Ballistic Missile (TBM) detection as well as enhanced data analysis and engineering modeling of threat profiles to support the TBM software enhancements. The FY 2019 funding request was reduced by $9.553M 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 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

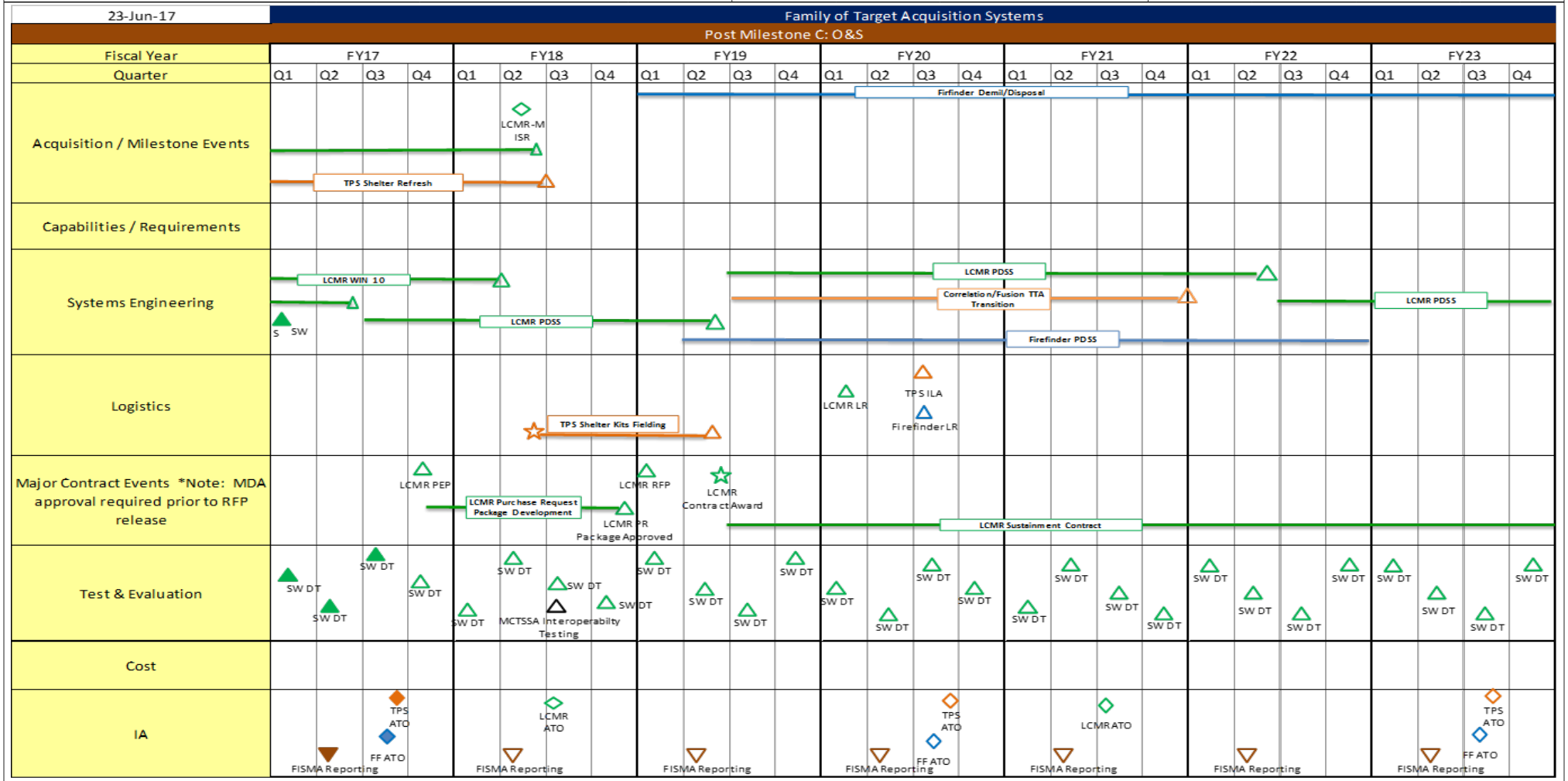


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

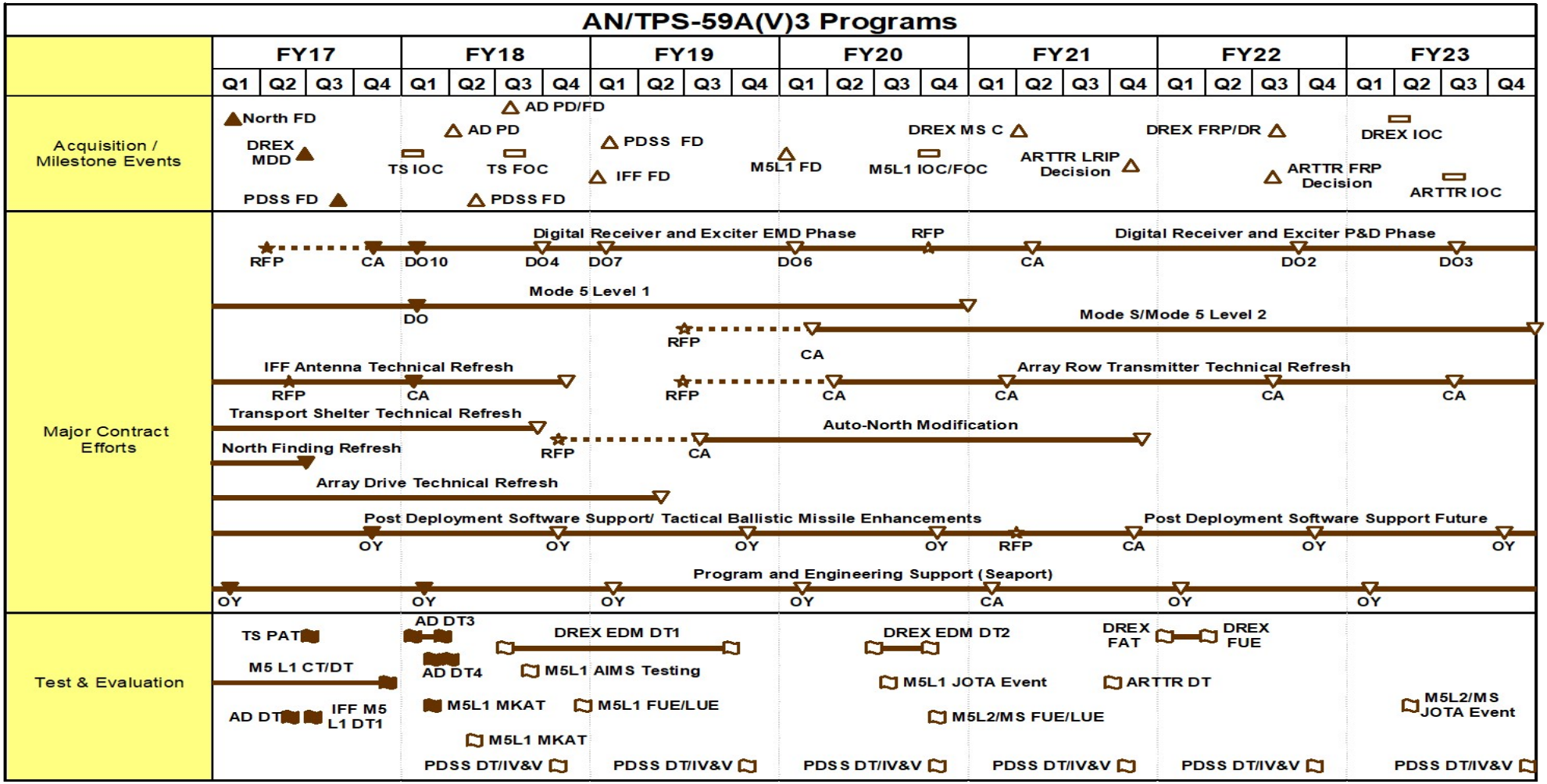


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3099 / *Radar System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3099				
FTAS - LCMR Mobile FOC	2	2018	2	2018
FTAS - TPS Shelter Refresh FOC	3	2018	3	2018
AN/TPS-59 IFF Fielding Decision	1	2019	1	2019
AN/TPS-59 PDSS TBM Fielding Decision	1	2019	1	2019
AN/TPS-59 DREX Delivery Order 7 Award	1	2019	1	2019
AN/TPS-59 PDSS TBM Option Year Award	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3772 / *Information Related Capabilities (IRC)*	

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
3772: *Information Related Capabilities (IRC)*	0.000	0.000	0.000	5.716	-	5.716	4.349	3.311	1.996	2.264	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, Marine Civil Information Management System (MARCIMS), Public Affairs System (PAS) and Military Information Support Operations (MISO) funding has been realigned from project 2277, System Engineering & Integration. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

Marine Civil Information Management System (MARCIMS) is a system of systems comprised of people, process and technology that operates in the full Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment. It is a force multiplier for the commander that allows him to leverage the process of Planning, Collection, Consolidation, Analysis, Production, and sharing of civil information in order to support the visualization and understanding of the civil environment to the military commander's decision making process. This program transitions from C2277 to C3772 in FY19.

Public Affairs System (PAS) provides the Marine Air Ground Task Force (MAGTF) and the broader Marine Corps the capability to research, understand and affect the information environment. PA Marines and Systems enable commanders at all levels and across the range of military operations to engage domestic and foreign publics whose trust, confidence, and understanding are mission critical. The Public Affairs Systems (PAS) AAP identifies and fields materiel solutions required to research and plan communication initiatives, acquire still and video visual information, produce and disseminate communication products, and assess the effects of communication initiatives within the information environment. The program maintains an evolutionary approach to acquisitions, and leverages commercial industry-standard non-developmental items to provide the best value to the Marine Corps, while keeping PA Marines appropriately equipped to understand and affect the information environment. This effort supports research and evaluate solutions to modernize the Public Affairs Still Acquisition System into a single handheld device with the capability to acquire, edit and transmit still and video imagery and engage publics via traditional and social media. This program transitions from C2277 to C3772 in FY19.

The Military Information Support Operations (MISO) Family of Systems (FOS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MISN), provides the Marine Air Ground Task Force (MAGTF) Commander the capability to conduct planned operations to convey selected information and indicators to foreign adversary, neutral and friendly target audiences to influence their emotions, motives, objective reasoning, providing an operational advantage. The MISO was established in response to multiple Marine Requirements Oversight Council Memorandums, and the approval of a MISO Organizational and Operational (O&O) Concept, 16 June 2015. MISO capabilities are critical to the success of the MAGTF mission, enabling commanders to shape the information environment, counter enemy propaganda, misinformation, disinformation, and adversarial narratives. The Signature Management (SIGMAN) capability will support MAGTF Operations with a baseline capability to include Own-force signature monitoring and assessment, Electromagnetic signature masking and projection, and physical decoys. This program transitions from C2277 to C3772 in FY19.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Public Affairs System (PAS): Product Development	0.000	0.000	0.092	0.000	0.092
Articles:	-	-	-	-	-
Description: Program transitions from C2277 to C3772 in FY19. ***FY 2018 Plans:*** - Under Project C2277 ***FY 2019 Base Plans:*** - Continue the research and evaluation of solutions to modernize the Public Affairs Live Media Engagement System (PALMES) with the capability to transmit imagery and engage publics via traditional and social media via Military Satellite Communications (MILSATCOM). These actions will include the evaluation of device solutions and research of information assurance requirements to accredit the Public Affairs transmission capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Increase of $0.92M from FY18 to FY19 reflects movement from C2277 to C3772.					
Title: Military Information Support Operations (MISO): Product Development	0.000	0.000	2.608	0.000	2.608
Articles:	-	-	-	-	-
Description: The MISO Family of Systems (FOS), which consists of the Fly-Away Broadcast System (FABS), Next-Generation Loud Speaker (NGLS), Radio-In-A-Box (RIAB), and Marine Corps SOF Integration Node (MISN), provides the Marine Air Ground Task Force (MAGTF) Commander the capability to conduct planned operations to convey selected information and indicators to foreign adversary, neutral and friendly target audiences to influence their emotions, motives, objective reasoning, providing an operational advantage. FY18 initiates product development of the Fly-Away Broadcast System (FABS) in preparation for a MS B decision. Program transitions from C2277 to C3772 in FY19. ***FY 2018 Plans:*** - Under Project C2277 ***FY 2019 Base Plans:*** - Continue engineering and manufacturing development of the Fly-Away Broadcast System (FABS).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate research and development efforts for Signature Management (SIGMAN) and tactical deception capabilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** - Increase of $2.068M from FY18 to FY19 reflects movement from C2277 to C3772.					
Title: MISO: Test and Evaluation	0.000	0.000	3.016	0.000	3.016
Articles:	-	-	3	-	3
FY 2018 Plans: - Project under C2277 ***FY 2019 Base Plans:*** - Initiate test and evaluation activities for Fly-Away Broadcast System (FABS). - Initiate procurement of 3 test assets (Small, Medium, Heavy) - Increase of $3.016M from FY18 to FY19 reflects development testing schedule for FABS. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $3.016M from FY18 to FY19 reflects movement from project C2277 to project C3772. Increase supports testing schedule for FABS.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.716	0.000	5.716

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/4620AA: *MARCIMS*	0.227	0.235	0.296	-	0.296	0.000	0.302	0.000	0.308	Continuing	Continuing
• PMC/4620BB: *PAS*	0.929	1.913	0.682	-	0.682	0.691	0.710	0.722	0.736	Continuing	Continuing
• PMC/4620CC: *MISO*	0.000	0.000	2.976	-	2.976	8.364	9.924	9.938	7.853	Continuing	Continuing
• 0206313M/C2277A: *MARCIMS*	0.164	0.422	0.000	-	0.000	0.439	0.000	0.000	0.000	Continuing	Continuing
• 0206313M/C2277B: *PAS*	0.090	0.093	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.183
• 0206313M/C2277C: *MISO*	0.000	3.055	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.055

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

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

MARCIMS, PAS, MISO transition from C2277 to C3772 in FY19.

D. Acquisition Strategy

MARCIMS will continue to support and sustain the current baseline system, while employing incremental changes to ensure that the system not only meets current requirements per the Letter of Clarification, but also allows for a more user friendly system. MARCIMS plans to begin development of MARCIMS 2.0 in a partnership with the Office of Naval Research (ONR), while simultaneously maintaining the current and approved version of the system.

Public Affairs System will maximize the utilization of commercial-off-the-shelf devices and software to provide best overall performance solutions to the warfighter with minimal developmental cost and schedule investments.

MISO will complete a production design of the FABS, validate production requirements, manage FABS technical risk and define system support requirements in FY18, leading to a MS B decision in Q2 FY18, MS C / LRIP decision in Q4 FY19, and an FRP decision in Q3 FY20.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

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
MISO	WR	TBD : TBD	0.000	0.000		0.000		1.526	Apr 2019	-		1.526	Continuing	Continuing	Continuing
MISO	WR	SSC-PAC : San Diego, CA	0.000	0.000		0.000		1.082	Apr 2019	-		1.082	Continuing	Continuing	Continuing
PAS	WR	SSC-PAC : San Diego, CA	0.000	0.000		0.000		0.092	Mar 2019	-		0.092	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		2.700		-		2.700	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
MISO	WR	SSC-LANT : Charleston, SC	0.000	0.000		0.000		3.016	Feb 2019	-		3.016	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		3.016		-		3.016	Continuing	Continuing	N/A

Remarks

MISO includes procurement of 3 test assets and test and evaluation support.

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base 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		5.716		-		5.716	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

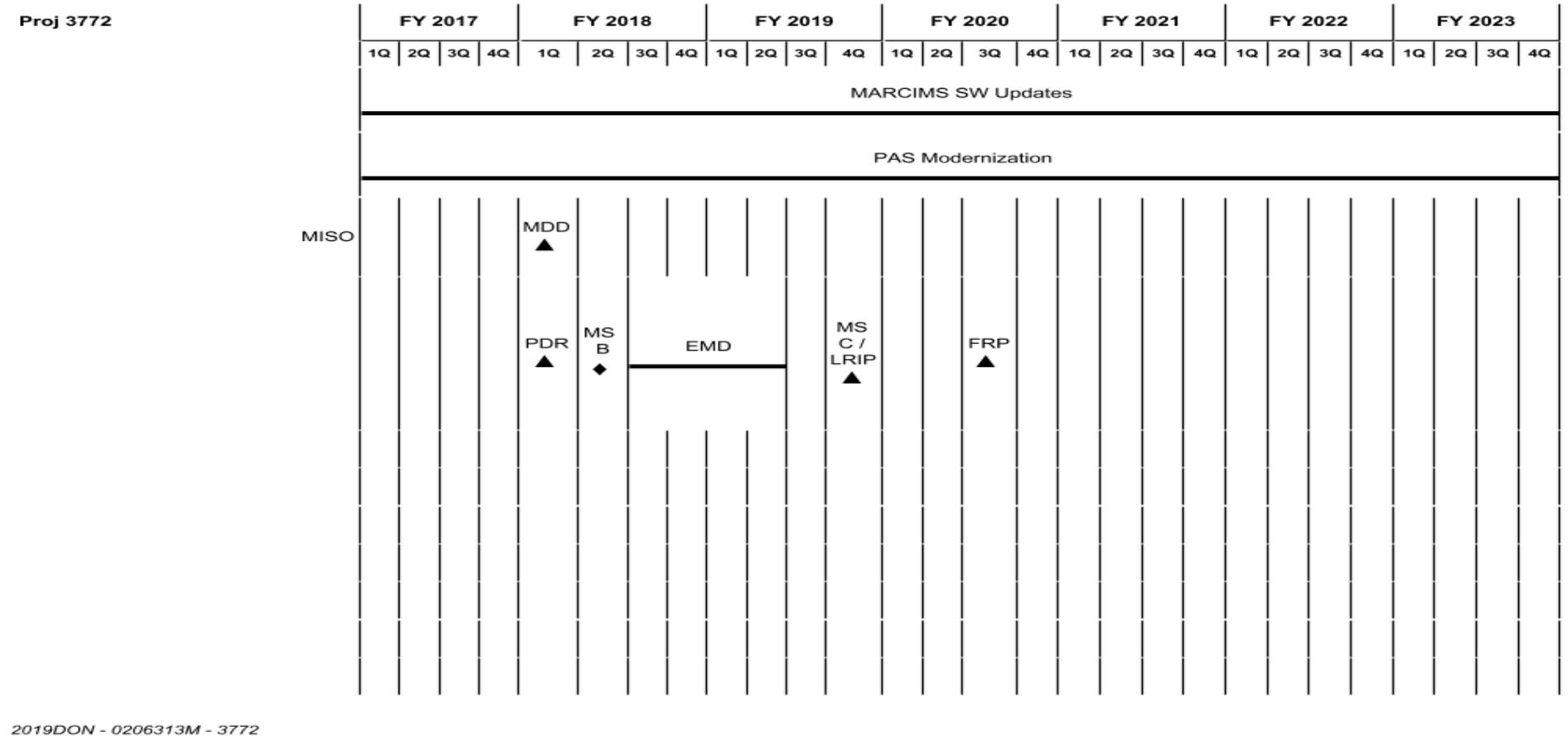


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3772 / *Information Related Capabilities (IRC)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3772				
MARCIMS SW Updates	1	2017	4	2023
PAS Modernization	1	2017	4	2023
MISO: MDD	1	2018	1	2018
MISO: PDR	1	2018	1	2018
MISO: MS B	2	2018	2	2018
MISO: EMD	3	2018	2	2019
MISO: MS C / LRIP	4	2019	4	2019
MISO: FRP	3	2020	3	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3773 / *Fire Coordination and 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
3773: *Fire Coordination and Sensors*	0.000	0.000	0.000	7.910	-	7.910	7.801	7.989	8.155	8.322	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS) - AFATDS FoS consists of three programs, AFATDS, Back Up Computer System (BUCS) and Mobile Tactical Shelter (MTS). The AFATDS automates the fire planning, tactical fire direction, and fire support coordination required to support maneuver from the sea and subsequent operations ashore. AFATDS integrates all supporting arms assets within the MAGTF such as mortars, cannon artillery, rockets and missiles, close air support, and naval surface fire support systems. BUCS is a hand-held computer system designed to provide a backup to the AFATDS in computing ballistic firing solutions, as well as provide survey and Meteorological functions in support of artillery. Additionally BUCS is the primary ballistic firing solution system during Ship To Objective Maneuver (STOM) and for the Expeditionary Fire Support System (EFSS). The MTS is a Lightweight Multi-purpose Shelter mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) which protects both the AFATDS and operators from the environment. MTS enables rapid emplacement and displacement of fire support elements and provides networked communications on the move.

Family of Target Acquisition Systems (FTAS) - The FTAS provides the MAGTF the capability to locate, identify, and attack enemy indirect fire weapons systems and observe and direct friendly artillery fire. The FTAS consists of the AN/TPQ-46 Firefinder Radar, the AN/TPQ-49 Lightweight Counter Mortar Radar, and the AN/TSQ-267 Target Processing Set. The FTAS is critical in the execution of counterfire and the integration of target acquisition information enabling attack by MAGTF assets. The FTAS also provides artillery firing units the ability to conduct artillery registration and other friendly fire missions. The FTAS encompasses the equipment required to support target acquisition within the target acquisition platoon and is resident in the headquarters battery of each artillery regiment. The program will continue to address system issues that arise due to DMSMS items within the FTAS. The USMC assumed the role of Primary Inventory Control Activity (PICA) for the AN/TPQ-49 in FY15 when the Army divested itself from the system.

Target Hand-Off System (THS) - The THS addressed a Marine Corps operational requirement for a lightweight, handheld, and accurate target acquisition engagement coordination system. THS provides MAGTF Commanders with the only man-portable target location capability that allows Air Officers and Fire Support Coordinators to prosecute identified targets. The THS' advance interoperability capability provides the MAGTF Commander with the only portable target acquisition system able to interoperate with all target prosecution platforms available in the battlefield. The THS is designed for the Forward Air Controllers (FACs), Forward Observers (FOs), Fire Support Teams (FSTs), Firepower Control Teams (FCTs), Tactical Air Control Parties (TACPs) and Reconnaissance Teams to quickly acquire targets in day, night and near-all-weather visibility conditions, in order to conduct precise, rapid indirect surface fire support, Naval Surface Fire Support (NSFS) and Close Air Support (CAS).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: FTAS: Product Development	0.000	0.000	1.246	0.000	1.246
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

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: - See Project C3099. ***FY 2019 Base Plans:*** - Initiate development of Lightweight Counter Mortar Radar (LCMR) tech refresh system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems.					
Title: FTAS: Test and Evalution	0.000	0.000	0.380	0.000	0.380
Articles:	-	-	-	-	-
FY 2018 Plans: - See Project C3099. ***FY 2019 Base Plans:*** - Continue interoperability testing for the Family of Target Acquisition Systems (FTAS) integration within the Marine Air-Ground Task Force (MAGTF). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, FTAS funding has been realigned from project 3099 Radar Systems.					
Title: AFATDS: Software Development and Integration	0.000	0.000	4.456	0.000	4.456
Articles:	-	-	-	-	-
FY 2018 Plans: - See Project C2270. ***FY 2019 Base Plans:*** - Continue development of AFATDS software version 7.0. - Initiate the development of the next generation Back-Up Computer System (BUCS). ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

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:*** Beginning in FY19, AFATDS funding has been realigned from project 2270 Radar Systems.					
Title: AFATDS: Test and Evaluation	0.000	0.000	0.500	0.000	0.500
Articles:	-	-	-	-	-
FY 2018 Plans: - See Project C2270. ***FY 2019 Base Plans:*** - Continue interoperability testing for AFATDS and BUCS software between all required Joint C2 and Fires systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, AFATDS funding has been realigned from project 2270 Radar Systems.					
Title: AFATDS: Management Services	0.000	0.000	0.650	0.000	0.650
Articles:	-	-	-	-	-
FY 2018 Plans: - See Project C2270. ***FY 2019 Base Plans:*** - Continue to provide Engineering Support personnel and travel. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, AFATDS funding has been realigned from project 2270 Radar Systems.					
Title: THS: Product Development	0.000	0.000	0.678	0.000	0.678
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
see project 2270 ***FY 2019 Base Plans:*** -Continue development of THS V2 software. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, THS funding has been realigned from project 2270 Radar Systems.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	7.910	0.000	7.910

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/473300: *Family of Target Acq Systems (FTAS)*	0.000	0.000	2.867	-	2.867	2.947	3.005	3.065	3.126	Continuing	Continuing
• PMC/473301: *Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS)*	0.000	0.000	12.521	-	12.521	12.852	15.531	15.908	16.245	Continuing	Continuing
• RDTE/C2270: *Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS)*	3.114	5.881	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.995
• RDTE/C3099: *Family of Target Acq Systems (FTAS)*	1.497	1.637	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.134
• PMC/463100: *Target Handoff System (THS)*	0.000	22.350	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	22.350
• PMC/47330: *Target Handoff System (THS)*	0.000	0.000	24.739	-	24.739	2.439	2.487	2.537	2.588	Continuing	Continuing
• PMC/463101: *Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS)*	3.596	15.697	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

D. Acquisition Strategy

Advanced Field Artillery Tactical Data Family of Systems (AFATDS FoS) - AFATDS is managed through Army CECOM, Aberdeen Proving Ground, MD. R&D efforts for the next AFATDS version will be a combined effort between the software developer, the Army PM, and the USMC for software enhancements through DISA. Current software enhancements are performed at Army, Ft. Sill, OK.

Family of Target Acquisition Systems (FTAS) - The Family of Target Acquisition Systems consists of 3 major components: AN/TPQ-46, AN/TPQ-49 and the AN/TSQ-267. Of these 3 systems, the AN/TPQ-46 is due to be replaced by the Ground/Air Task Oriented Radar (G/ATOR) beginning in 2019. Sustainment activities during 2016 and beyond will be limited to maintain the authority to operate (ATO) creditation. Sustainment activities on the AN/TPQ-49 are escalating due to the fact the US Army divested from the AN/TPQ-49, the USMC has assumed the responsibilities of the primary inventory control activity (PICA). Program Office will conduct an engineering change to the AN/TPQ-49 to provide the operating forces with a mobile, stand-alone configuration. Sustainment activities on the AN/TPQ-46 will begin to escalate due to the US Army divestiture from the AN/TPQ-36. The USMC will assume some sustainment responsibilities for the AN/TPQ-46 until replaced by G/ATOR. Additionally, the AN/TSQ-267 requires hardware updates in order to continue housing the suite of equipment that supports the Target Processing Center (TPC) activities.

THS: The acquisition of components (software/hardware) for the THS initiative will maximize the use of existing COTS, Government-Off-The-Shelf (GOTS), Non-Developmental Item (NDI), and Government Furnished Equipment (GFE). Software is transitioning to a government owned baseline. Software must maintain compatibility with five Programs of Record (POR) and seven Operational Flight Programs (OFP).

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	Project (Number/Name) 3773 / *Fire Coordination and Sensors*	

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
FTAS	C/FFP	TBD : TBD	0.000	0.000		0.000		1.246	Feb 2019	-		1.246	0.000	1.246	-
AFATDS	MIPR	DISA : Belleville, IL	0.000	0.000		0.000		4.456	Feb 2019	-		4.456	0.000	4.456	-
THS	C/CPFF	Army : Huntsville, AL	0.000	0.000		0.000		0.678	Jan 2019	-		0.678	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		6.380		-		6.380	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
FTAS	WR	MCTSSA : CAMP PENDLETON, CA	0.000	0.000		0.000		0.380	Feb 2019	-		0.380	0.000	0.380	-
AFATDS	C/FFP	MCTSASA : CAMP PENDLETON, CA	0.000	0.000		0.000		0.500	Feb 2019	-		0.500	0.000	0.500	-
		Subtotal	0.000	0.000		0.000		0.880		-		0.880	0.000	0.880	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
AFATDS	C/CPFF	CECOM/MITRE : Ft. Monmouth, NJ	0.000	0.000		0.000		0.650	Nov 2018	-		0.650	0.000	0.650	-
		Subtotal	0.000	0.000		0.000		0.650		-		0.650	0.000	0.650	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		7.910		-		7.910	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

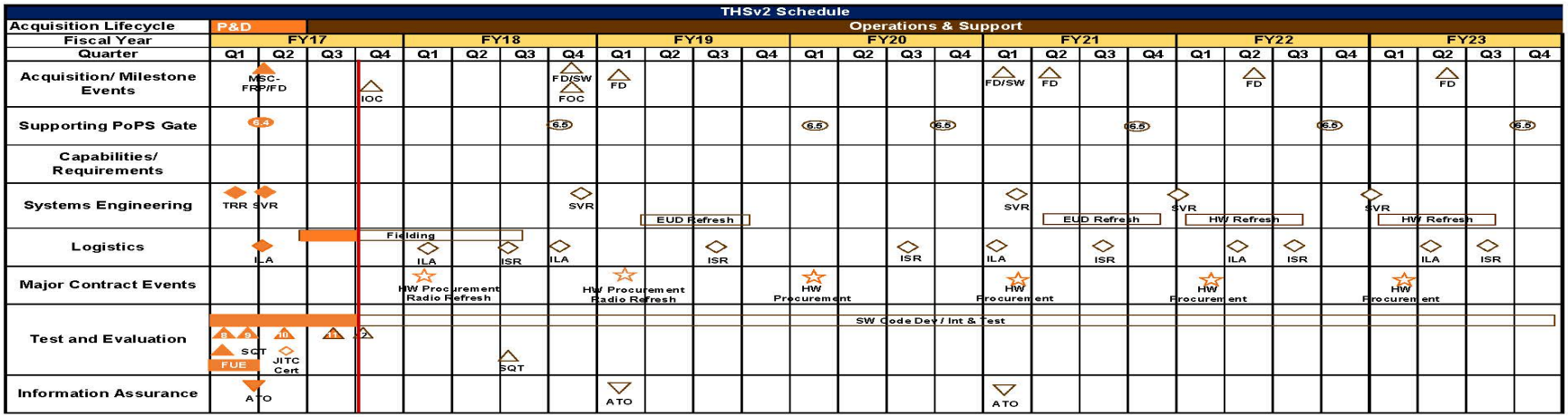


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

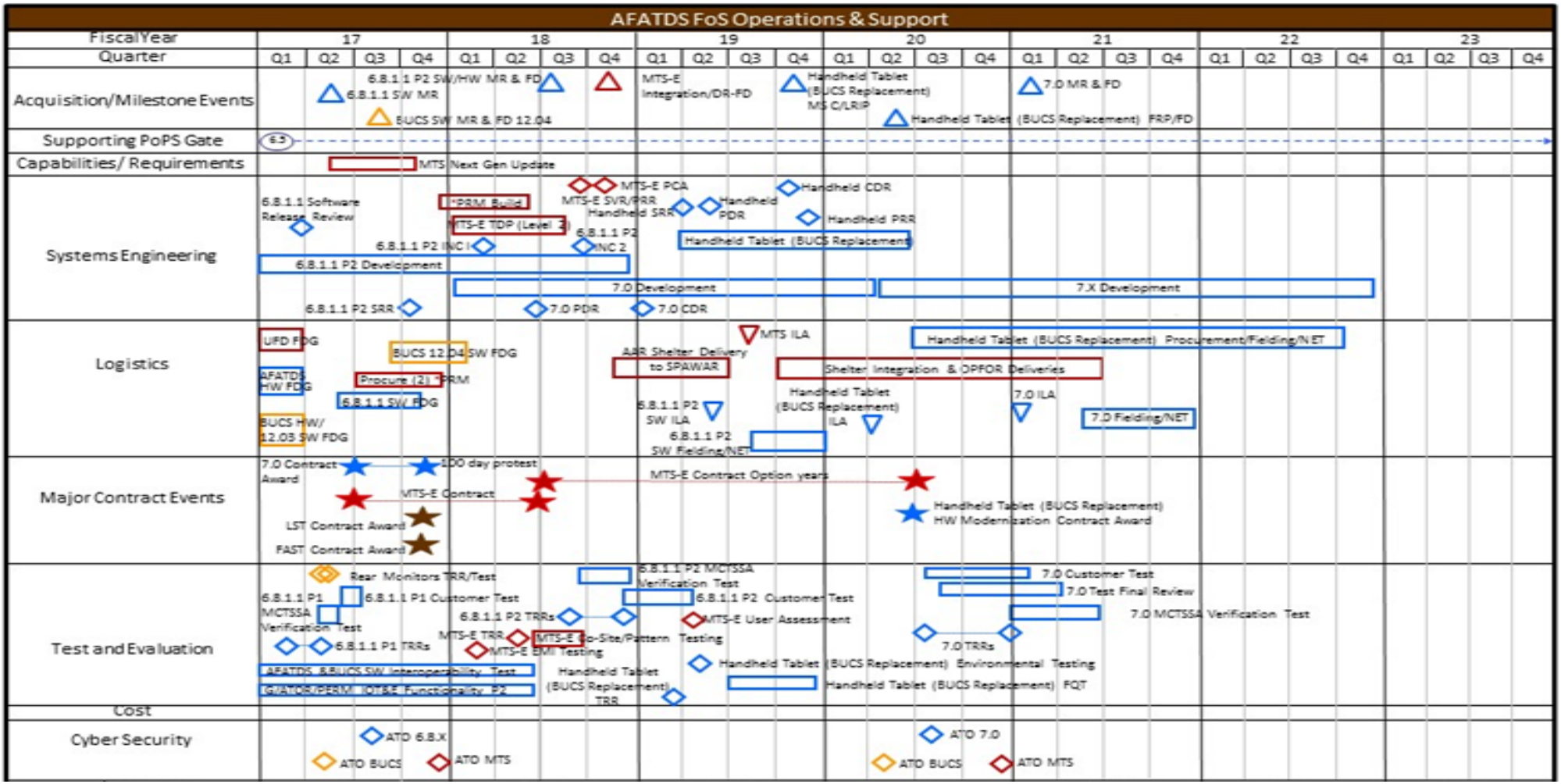


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

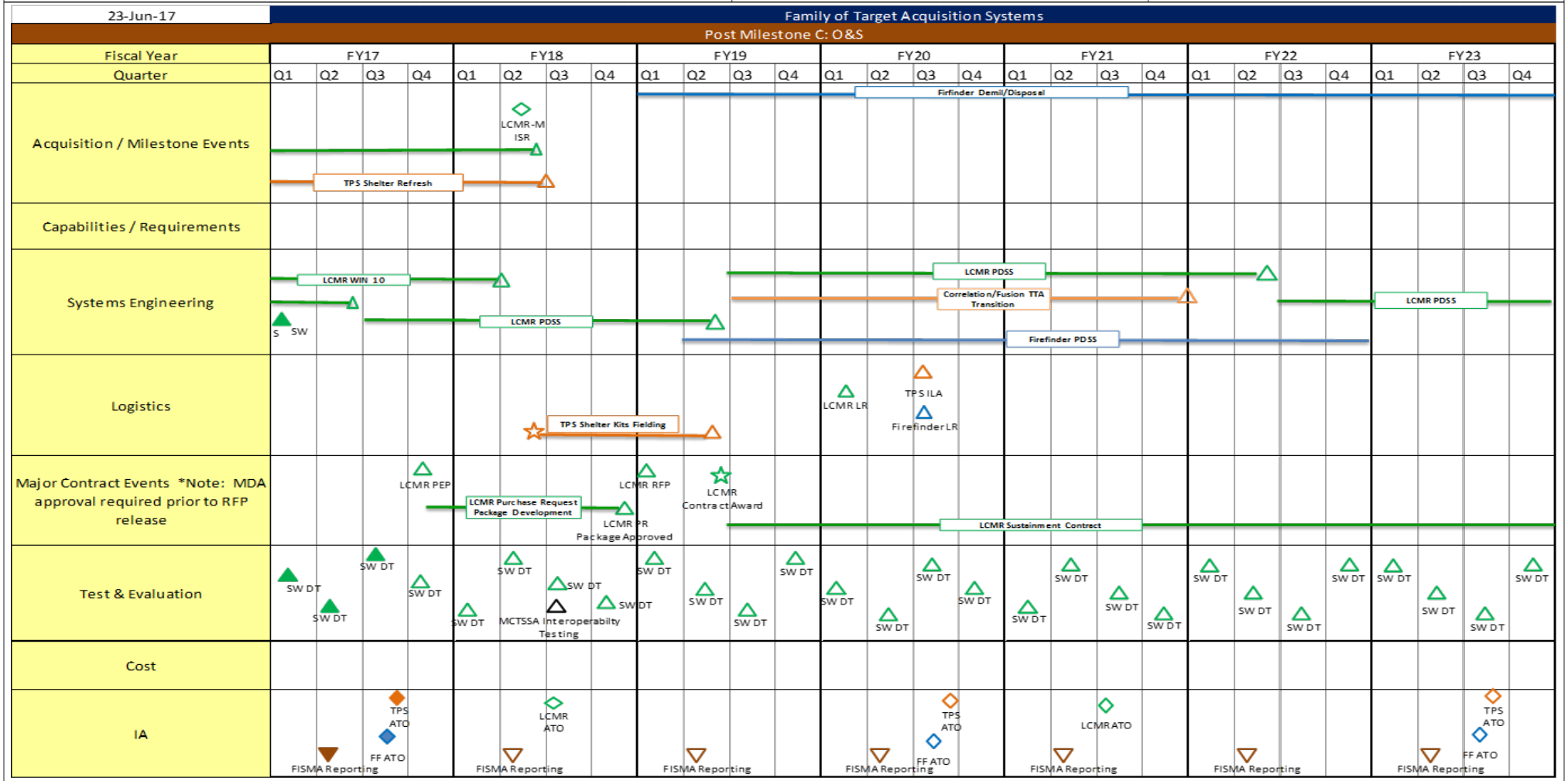


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 3773 / *Fire Coordination and Sensors*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3773				
AFATDS 7.0 Software Development	1	2018	2	2020
AFATDS 7.0 Testing	3	2020	3	2021
FTAS - LCMR FOC	2	2018	2	2018
FTAS - TPS Shelter Refresh FOC	3	2018	3	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms 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*	12.552	17.409	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	29.961
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Congressional Add, not required for BES/PB-19

A. Mission Description and Budget Item Justification

Joint Interoperability of Tactical Command and Control Systems (JINTACCS) $5.803M - The USMC JINTACCS program provides for critical engineering services. JINTACCS is essential to USMC development and maintenance of tactical data exchange standards (Link 16, Variable Message Format (VMF), United States Message Text Format (USMTF), etc.) focused on achieving Joint interoperability through: (1) the standardization of message protocols, format, content, implementation, and documentation; (2) the assessment and identification of Tactical Data Link (TDL) and tactical data message interoperability shortfalls and their impact to interoperability; (3) the alignment of TDL and tactical data message implementation with desired capabilities; and (4) the posturing Marine Corps TDL and tactical data message users for migration to emerging formats and transmission waveforms. This includes: (1) The continued exploration of solutions for addressing a Joint capability gap in tactical radio bridging; (2) Implementation and management of the Marine Corps Interoperability Enhancement Program (IEP), a Chairman Joint Chief of Staff Instruction (CJCSI) 6610.01E required process for using automated tools and procedures to assess bit-level interoperability of systems implementing TDL and tactical data messages and document Marine Corps systems' TDL bit-level message implementation; and (3) Expand TDL and VMF support to include Marine Corps aviation and intelligence systems to ensure adherence to standards and to enable interoperability with Joint and Allied command and control and weapon systems.

Long Range Radar (AN/TPS-59) $11.606M - The AN/TPS-59A(V)3 is a transportable, three dimensional, tactical radar system that provides the Marine Air Ground Task Force (MAGTF) with long-range surveillance. It is the MAGTF's only ground based long range sensor that provides the capability to detect and report Air Breathing Targets (ABT) and track Theater Ballistic Missiles (TBM). The AN/TPS-59A(V)3 Radar System is connected to the Common Aviation Command and Control Systems (CAC2S). It provides the air defense controllers data and may be used autonomously to conduct Ground control Intercept, tactical en-route Air Traffic Control (ATC), or TBM alert operations via the joint Integrated Air Missile Defense (IAMD) encrypted Link-16. The USMC extended the AN/TPS-59 service life through 2035; therefore, in order to maintain its operational relevance on the battlefield, a number of modernization efforts are being initiated. The Digital Receiver and Exciter (DREX) upgrade will convert the analog receivers and exciters to digital to address Diminishing Manufacturing Sources and Material Shortages (DMSMS) issues, enable spectral agility, reduce noise, reduce false alarms, and enhance electronic counter-countermeasures (ECCM) capability. This effort will include an essential simulation and test environment capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
Congressional Add: Program Increase	5.803	0.000
FY 2017 Accomplishments: JINTACCS Congressional Program Increase:		

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2017	FY 2018
-Initiated testing, analyzed and evaluated the suitability of Multi-Media Gateways to provide effective, technical interfaces between tactical C4I systems and commercial networks & systems in support of MAGTF HA/DR operations. To include: procurement of test items, Test Plan / Test Procedures, Safety Analysis, and Information Assurance; setup of Free Space Optics in demonstration, and classified Electronic Warfare analysis. Actual test event will be executed in FY18. -Initiated the implementation of eSMART for bit-level interoperability assessment of USMC ground C2 systems within PEO-LS/MARCORSYSCOM -Initiated VMF SME support to PEO-LS/MARCORSYSCOM programs to ensure USMC Ground, tactical C4I systems adhere to established DoD standards and enable interoperability with Joint and Allied command and control and weapon systems. *JINTACCS Congressional Program Increase received July 2017 ***FY 2018 Plans:*** N/A		
Congressional Add: Radar Enhancements ***FY 2017 Accomplishments:*** -Developed Mode 5 Level 1. -Developed Digital Receiver and Exciter (DREX) Engineering Development Model (EDM). -Developed Enhanced Software for Tactical Ballistic Missile (TBM). ***FY 2018 Plans:*** N/A	11.606	0.000
Congressional Adds Subtotals	17.409	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
• PMC/465000: *AN/TPS-59 Mods*	14.076	8.956	6.694	-	6.694	10.460	12.265	16.140	16.473	Continuing	Continuing
• RDTE/0206313M/ C3099: *AN/TPS-59 Mods*	7.642	10.791	15.307	-	15.307	19.584	17.322	17.162	12.421	Continuing	Continuing
• RDTE/0206313M/C2277: *JOINT INTEROPERABILITY OF TACT C2 SYSDescription.*	0.582	0.572	0.570	-	0.570	0.579	0.590	0.600	0.612	Continuing	Continuing

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*

D. Acquisition Strategy

Long Range Radar (AN/TPS-59) - Due to the proprietary nature of the software, the AN/TPS-59 Program will utilize a sole source contract with the OEM for software and Digital Receiver and Exciter development. The AN/TPS-59 Program will utilize full and open competition to the max extent possible on areas that do not have proprietary restrictions.

JINTACCS - Explore solutions for addressing a Joint capability gap in tactical radio bridging. The research will continue investigations of materiel products that address the shortfalls in the ability to bridge voice, data and video between disparate tactical Command, Control, Communications and Computer (C4) systems utilizing multi-media gateways. Implement the USMC Interoperability Enhancement Process (IEP) through the Interoperable Systems Management and Requirements Transformation (iSMART) processes, the Enhanced Systems Management and Requirements Transformation (eSMART) tool set, and the Joint Capabilities and Limitations (JC&L) interoperability tool, IAW CJCSI 6610.01E.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms 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
AN/TPS-59 Enhanced Software Development for TBM	SS/CPFF	LMC : Syracuse, NY	0.000	3.510	Jul 2017	0.000		0.000		-		0.000	0.000	3.510	-
AN/TPS-59 DREX EDM Development	SS/CPFF	LMC : Syracuse, NY	0.000	5.340	Aug 2017	0.000		0.000		-		0.000	0.000	5.340	-
AN/TPS-59 Mode 5 Level 1 Development	SS/CPFF	LMC : Syracuse, NY	0.000	1.093	Dec 2017	0.000		0.000		-		0.000	0.000	1.093	-
JINTACC-TSOA Data Transit Development	C/FFP	PfM CES : Quantico, VA	0.000	0.600	Oct 2017	0.000		0.000		-		0.000	0.000	0.600	-
JINTACC-JTCW Integration	C/FFP	PfM CES : Quantico, VA	0.000	0.575	Feb 2018	0.000		0.000		-		0.000	0.000	0.575	-
JINTACC-WALDO Integration	MIPR	SSC-A : Charleston, SC	0.000	0.300	Sep 2017	0.000		0.000		-		0.000	0.000	0.300	-
Prior Year Cumulative Funding	Various	Various : Various	1.766	0.000		0.000		0.000		-		0.000	0.000	1.766	-
		Subtotal	1.766	11.418		0.000		0.000		-		0.000	0.000	13.184	N/A

Remarks

*JINTACCS Congressional Program Increase received July 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
JINTACC-Safety Support to Testing	C/BA	NSWC : Various	0.000	0.275	Oct 2017	0.000		0.000		-		0.000	0.000	0.275	-
JINTACC-eSMART implementation	C/BA	DTIC/MANTECH : Quantico, VA	0.000	0.300	Nov 2017	0.000		0.000		-		0.000	0.000	0.300	-
JINTACC-VMF Integration Support	C/BA	HHS/CSRA : Falls Church, VA	0.000	0.200	Nov 2017	0.000		0.000		-		0.000	0.000	0.200	-
JINTACC-Travel	Various	Various : Various	0.000	0.050	Aug 2017	0.000		0.000		-		0.000	0.000	0.050	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**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
Prior Year Cumulative Funding	Various	Various : Various	7.943	0.000		0.000		0.000		-		0.000	0.000	7.943	-
		Subtotal	7.943	0.825		0.000		0.000		-		0.000	0.000	8.768	N/A

Remarks

*JINTACCS Congressional Program Increase received July 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
JINTACC-Multi-Media Suitability Testing	MIPR	Naval Research Laboratory : Washington DC	0.000	2.703	Aug 2017	0.000		0.000		-		0.000	0.000	2.703	-
JINTACC-Multi-Media Suitability Testing Support	MIPR	NSWC : Carderock, Maryland	0.000	0.470	Sep 2017	0.000		0.000		-		0.000	0.000	0.470	-
JINTACC-WALDO Assesment	MIPR	CECOM/MITRE : Mclean, VA	0.000	0.330	Nov 2017	0.000		0.000		-		0.000	0.000	0.330	-
Prior Year Cumulative Funding	Various	Various : Various	0.210	0.000		0.000		0.000		-		0.000	0.000	0.210	-
		Subtotal	0.210	3.503		0.000		0.000		-		0.000	0.000	3.713	N/A

Remarks

*JINTACCS Congressional Program Increase received July 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
AN/TPS-59 Engineering Support	SS/FFP	MITRE : Bedford, MA	2.633	1.663	Sep 2017	0.000		0.000		-		0.000	0.000	4.296	-
		Subtotal	2.633	1.663		0.000		0.000		-		0.000	0.000	4.296	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206313M / *Marine Corps Comms Systems*	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
Project Cost Totals	12.552	17.409		0.000		0.000		-		0.000	0.000	29.961	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*

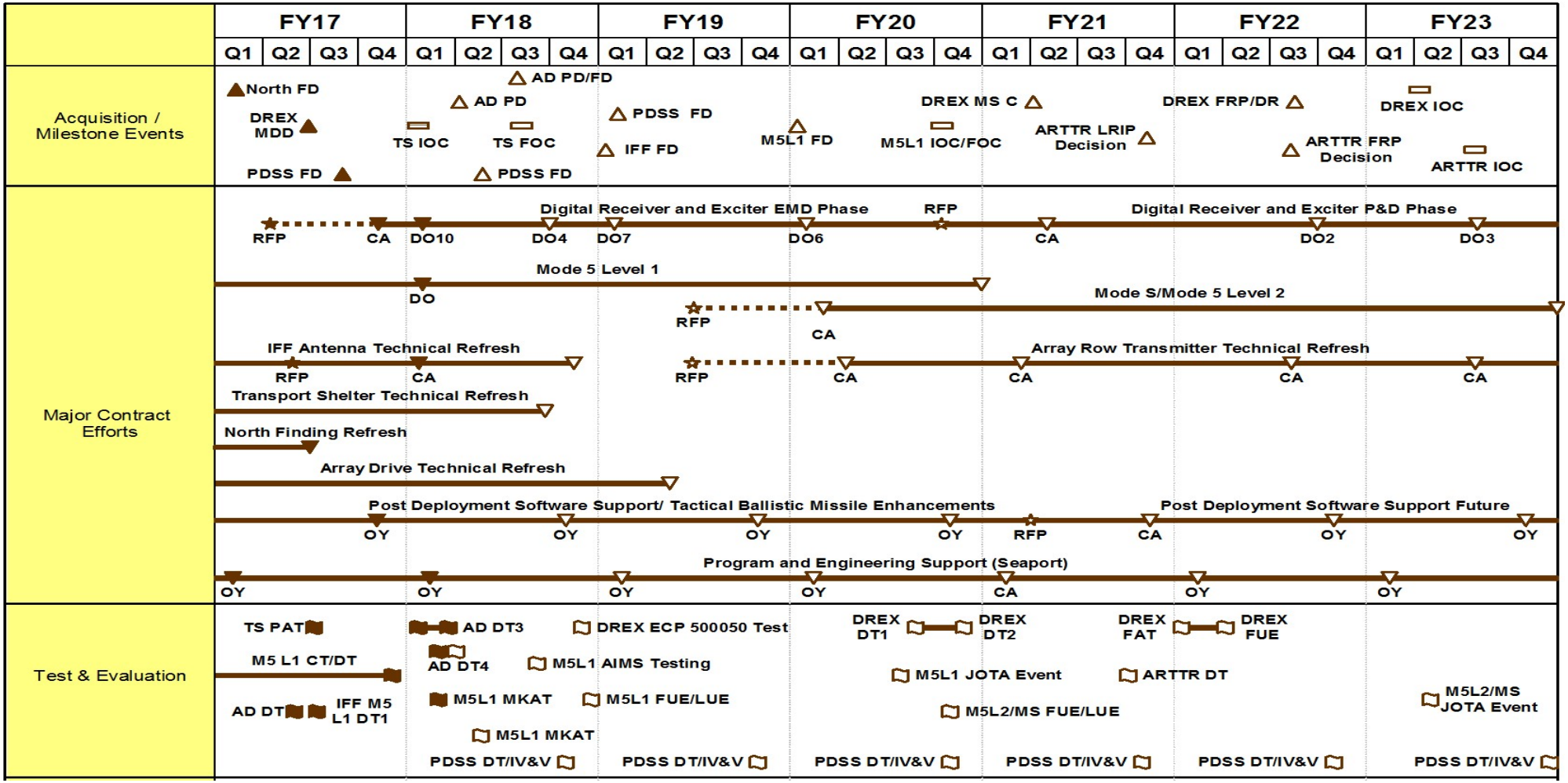


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206313M / *Marine Corps Comms Systems*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9999				
AN/TPS-59 DREX EMD Phase Contract Award	4	2017	4	2017

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206335M *I (U)Common Aviation Command and Control Sys (CAC2S)*							
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	45.527	6.934	7.343	4.826	-	4.826	4.506	4.356	4.439	4.540	Continuing	Continuing
3373: *Common Aviation Command and Control System (CAC2S)*	45.527	6.934	7.343	4.826	-	4.826	4.506	4.356	4.439	4.540	Continuing	Continuing
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** MN36												

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) - A coordinated modernization effort to replace the existing aviation command and control equipment of the Marine Air Command and Control System (MACCS) and to provide the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. The CAC2S system will accomplish the MACCS missions with a suite of operationally scalable modules to support the Marine Air Ground Task Force (MAGTF), Joint, and Coalition Forces. The CAC2S integrates the functions of aviation command and control into an interoperable system that will support the core competencies of all Marine Corps warfighting concepts. The CAC2S, in conjunction with the MACCS organic sensors (AN/TPS-63, AN/TPS-59 and AN/TPS-80 (Ground/Air Task Oriented Radar (G/ATOR)) and weapon system Composite Tracking Network (CTN) will provide enhanced air control, improved situational awareness, sensor integration (G/ATOR and AN/TPS-59), full Tactical Data Link integration, airspace and battle planning and command functionality as well as sensor netting integration (CTN). CAC2S with these organic MACCS programs support the tenets of Expeditionary Maneuver Warfare and fosters joint interoperability. CAC2S Increment I will replace legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), and Tactical Air Operations Center (TAOC).

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	11.850	7.343	4.936	-	4.936
Current President's Budget	6.934	7.343	4.826	-	4.826
Total Adjustments	-4.916	0.000	-0.110	-	-0.110
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.733	0.000			
• SBIR/STTR Transfer	-0.309	0.000			
• Rate/Misc Adjustments	0.000	0.000	-0.110	-	-0.110
• Congressional Directed Reductions Adjustments	-2.874	-	-	-	-

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206335M *I (U)Common Aviation Command and Control Sys (CAC2S)*

Change Summary Explanation

Funding decrease of $2.517M from FY 2018 to FY 2019 largely due to the completion of interface support provided to G/ATOR during developmental test and operational assessment events conducted as well as completion of Communication Subsystem hardware development effort conducted in FY 2018.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	Project (Number/Name) 3373 / *Common Aviation Command and Control System (CAC2S)*	

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
3373: *Common Aviation Command and Control System (CAC2S)*	45.527	6.934	7.343	4.826	-	4.826	4.506	4.356	4.439	4.540	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: MN36

Note

Prior year funding is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

A. Mission Description and Budget Item Justification

Common Aviation Command and Control System (CAC2S) - A coordinated modernization effort to replace the existing aviation command and control equipment of the Marine Air Command and Control System (MACCS) and to provide the Aviation Combat Element (ACE) with the necessary hardware, software, equipment, and facilities to effectively command, control, and coordinate aviation operations. The CAC2S system will accomplish the MACCS missions with a suite of operationally scalable modules to support the Marine Air Ground Task Force (MAGTF), Joint, and Coalition Forces. The CAC2S integrates the functions of aviation command and control into an interoperable system that will support the core competencies of all Marine Corps warfighting concepts. The CAC2S, in conjunction with the MACCS organic sensors (AN/TPS-63, AN/TPS-59, and AN/TPS-80 (Ground/Air Task Oriented Radar (G/ATOR)) and weapon system Composite Tracking Network (CTN) will provide enhanced air control, improved situational awareness, sensor integration (G/ATOR and AN/TPS-59), full Tactical Data Link integration, airspace and battle planning and command functionality as well as sensor netting integration (CTN). CAC2S, with these organic MACCS programs, support the tenets of Expeditionary Maneuver Warfare and fosters joint interoperability. CAC2S Increment I will replace legacy aviation command and control systems in the following Marine aviation agencies: Direct Air Support Center (DASC), Tactical Air Command Center (TACC), and Tactical Air Operations Center (TAOC). Funding decrease of $2.517M from FY 2018 to FY 2019 largely due to the completion of interface support provided to G/ATOR during developmental test and operational assessment events conducted as well as completion of Communication Subsystem hardware development effort conducted in FY 2018.

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	1.987	1.063	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Conduct integration of CAC2S with G/ATOR and associated CTN implementation. - Perform root cause analysis of G/ATOR and related CTN findings resulting from G/ATOR DT-1C and OA. - Implement the required corrections resulting from G/ATOR DT-1C and OA test events.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Complete CAC2S Phase 1 Communication Subsystem hardware modification development effort. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.063M from FY 2018 to FY 2019 due to the completion of hardware/software development efforts resulting from completion of CAC2S Phase 1 Communication Subsystem hardware modification development effort.					
Title: Support and Management Services	2.251	2.094	1.033	0.000	1.033
Articles:	-	-	-	-	-
FY 2018 Plans: - Conduct yearly Cyber Compliance Tests required with each of the CAC2S quarterly software releases and conduct the Annual Security Review testing to support the maintenance of the CAC2S Authority to Operate (ATO). - Perform root cause analysis of G/ATOR and related CTN findings and implement the required corrections to support the G/ATOR DT-1E test event. - Continue MITRE support during G/ATOR DT-1E test event. ***FY 2019 Base Plans:*** - Conduct yearly Cyber Compliance Tests required with each of the CAC2S quarterly software releases and conduct the Annual Security Review testing to support the maintenance of the CAC2S Authority to Operate (ATO). - Continue MITRE support during G/ATOR DT-1E, IOT&E, and CAC2S Phase 2 FOT&E test events. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $1.061M from FY 2018 to FY 2019 reflects reduction of hardware/software engineering efforts resulting from completion of G/ATOR DT-1C and OA in FY 2018.					
Title: Test and Evaluation	2.696	4.186	3.793	0.000	3.793

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

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 interface test support during G/ATOR DT-1C and OA test events. - Initiate interface test support during G/ATOR DT-1E test event. - Complete the Air Command and Control Interface Design Document (IDD). Implement the software changes resulting from the updated and approved IDD and support the certification testing of the associated IDD CTN software adaptive layer. CAC2S interfaces with G/ATOR through CTN or alternatively, through a direct connection to the radar. The IDD changes must be implemented and tested on CAC2S, CTN and G/ATOR in order to enable the systems to exchange data and support the required concepts of employment. - Implement the Mode 5, Mode S and CTN Web Identification software changes required to support the CAC2S FOT&E and close out the caveats identified in the CAC2S Joint Interoperability Certification memorandum. Mode 5/Mode S implementation is DOD directed. The G/ATOR and AN/TPS-59 radars will implement hardware and software changes to enable integration of M-5/M-S. CAC2S and CTN must implement and test software changes needed to read and integrate the radars M-5/M-S data. CTN Wed ID changes are required to enable use of M-5/M-S data in support of CEC network-wide, automated identification (ID) doctrine. ***FY 2019 Base Plans:*** - Conduct interface test support during G/ATOR DT-1E and IOT&E as well as CAC2S Phase 2 FOT&E to validate G/ATOR interface. - Conduct integration and test of Communication Subsystem hardware refresh to ensure operational readiness and compatibility with system baseline prior to fielding. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.393M from FY 2018 to FY 2019 due to reduction of field activity T&E support as a result of completing G/ATOR DT-1C and OA in FY 2018.					
Accomplishments/Planned Programs Subtotals	6.934	7.343	4.826	0.000	4.826

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

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/4644: *Common Aviation Command And Control System (CAC2S)*	52.487	44.928	35.467	-	35.467	34.412	33.781	16.710	17.476	0.000	265.677

Remarks

RDT&E prior to FY15 is listed in PE 0206313M Marine Corps Comms Systems, Project 2273 Air Operations Command & Control (C2) Systems.

PMC funding for FY15 and beyond is listed in BLI 4644 Common Aviation Command and Control System (CAC2S). Prior to FY15 PMC funding is listed in BLI 4640 Air Operations C2 Systems, Common Aviation Command and Control Systems (CAC2S).

D. Acquisition Strategy

CAC2S will employ an evolutionary acquisition strategy utilizing an incremental and phased approach for development and fielding of the CAC2S. The Capability Production Document (CPD) identifies two increments to achieve the full requirements of CAC2S. The current acquisition strategy addresses Increment I of the CAC2S development process and focuses on the requirements that will modernize the assault and air support, air defense and control, and Aviation Combat Element (ACE) battle management capabilities of the Marine Air Command and Control System (MACCS). Increment I of the CAC2S will be accomplished through a two phased approach. Phase 1 addresses the requirements to establish the baseline CAC2S capabilities for the MACCS and improve Air Command and Control (AC2) performance and effectiveness. Phase 2 will address the requirements for remaining ACE Battle Management Command & Control (BMC2) requirements. Quantity nine (9) Limited Deployment Unit systems were procured in FY15 and FY16 and fielded in FY17. Full Deployment Unit (FDU) production contract awarded 24 August 2017 and will provide a total of forty one (41) systems to be fielded over three years (FY 2018-FY 2020). Approved Acquisition Objective is 50 systems.

E. Performance Metrics

Integrated Master Schedule
OSD Financial Benchmarks
Technical Performance Measures
Probability of Program Success (PoPS) Assessments

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*	

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	NSWC CD : Crane, IN	1.784	0.258	Nov 2016	0.264	Nov 2017	0.000		-		0.000	0.896	3.202	-
Engineering Manufacturing and Development	C/FPIF	General Dynamics : Pheonix, AZ	3.800	0.000		0.000		0.000		-		0.000	16.544	20.344	59.922
Software Development	WR	NSWC DD : Dahlgren, VA	2.373	0.532	Nov 2016	0.799	Nov 2017	0.000		-		0.000	0.000	3.704	-
Hardware and Software Engineering	C/CPIF	NSWC CD : Crane, IN	0.000	1.197	Mar 2017	0.000		0.000		-		0.000	0.000	1.197	-
		Subtotal	7.957	1.987		1.063		0.000		-		0.000	17.440	28.447	N/A

Remarks

Decrease of $1.063M from FY 2018 to FY 2019 due to the completion of hardware/software development efforts resulting from completion of CAC2S Phase 1 Communication Subsystem hardware modification development effort.

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
Reliability Assessment	MIPR	AMSSA : Aberdeen, MD	0.801	0.185	Nov 2016	0.000		0.000		-		0.000	0.238	1.224	-
Interoperability Certification	MIPR	JITC : Fort Huachuca, AZ	0.800	0.074	Nov 2016	0.000		0.000		-		0.000	0.265	1.139	-
Safety Engineering	C/FP	MCSC Safety : TBD	0.425	0.119	Nov 2016	0.000		0.000		-		0.000	0.095	0.639	-
Travel	Various	Travel : TBD	0.143	0.072	Oct 2016	0.050	Oct 2017	0.039	Oct 2018	-		0.039	Continuing	Continuing	Continuing
Engineering Support	WR	NSWC DD : Dahlgren, VA	0.528	1.035	Nov 2016	1.151	Nov 2017	0.233	Nov 2018	-		0.233	0.000	2.947	-
Acquisition Support	WR	NSWC CD : Crane, IN	0.000	0.199	Nov 2016	0.372	Nov 2017	0.241	Nov 2018	-		0.241	0.000	0.812	-
Prior Years Cumulative Funding	Various	Various : Various	1.717	0.000		0.000		0.000		-		0.000	0.000	1.717	-
		Subtotal	4.414	1.684		1.573		0.513		-		0.513	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	Project (Number/Name) 3373 / *Common Aviation Command and Control System (CAC2S)*	

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

Decrease of $1.060M from FY 2018 to FY 2019 reflects reduction of hardware/software engineering and acquisition support resulting from completion of G/ATOR DT-1C and OA in FY 2018.

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 Evaluation	WR	NSWC - Port Huenueme : Port Huenueme, CA	1.751	0.558	Nov 2016	0.623	Nov 2017	0.442	Nov 2018	-		0.442	0.955	4.329	-
Testing and Evaluation	Sub Allot	MCOTEA : Quantico, VA	2.538	0.500	Jan 2017	0.000		0.000		-		0.000	3.465	6.503	-
Testing and Evaluation	Sub Allot	MCTSSA : Camp Pendleton, CA	7.076	0.178	Nov 2016	0.250	Nov 2017	0.118	Nov 2018	-		0.118	0.952	8.574	-
Testing and Evaluation	WR	NSWC CD : Crane, IN	7.078	0.325	Nov 2016	0.907	Nov 2017	0.878	Nov 2018	-		0.878	7.445	16.633	-
Testing and Evaluation	WR	NSWC DD : Dahlgren, VA	1.351	1.135	Nov 2016	2.406	Nov 2017	2.355	Nov 2018	-		2.355	0.000	7.247	-
Prior Years Cumulative Funding	Various	Various : Various	8.624	0.000		0.000		0.000		-		0.000	0.000	8.624	-
		Subtotal	28.418	2.696		4.186		3.793		-		3.793	12.817	51.910	N/A

Remarks

Decrease of $0.393M from FY 2018 to FY 2019 due to reduction of field activity T&E support as a result of completing G/ATOR DT-1C and OA in FY 2018.

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 Years Cumulative Funding	Various	Various : Various	2.732	0.000		0.000		0.000		-		0.000	0.000	2.732	19,096.227

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	Project (Number/Name) 3373 / *Common Aviation Command and Control System (CAC2S)*	

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
Sensor Management	C/FFP	MITRE : Bedford, MA	2.006	0.567	Oct 2016	0.521	Oct 2017	0.520	Oct 2018	-		0.520	2.958	6.572	-
		Subtotal	4.738	0.567		0.521		0.520		-		0.520	2.958	9.304	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	45.527	6.934		7.343		4.826		-		4.826	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

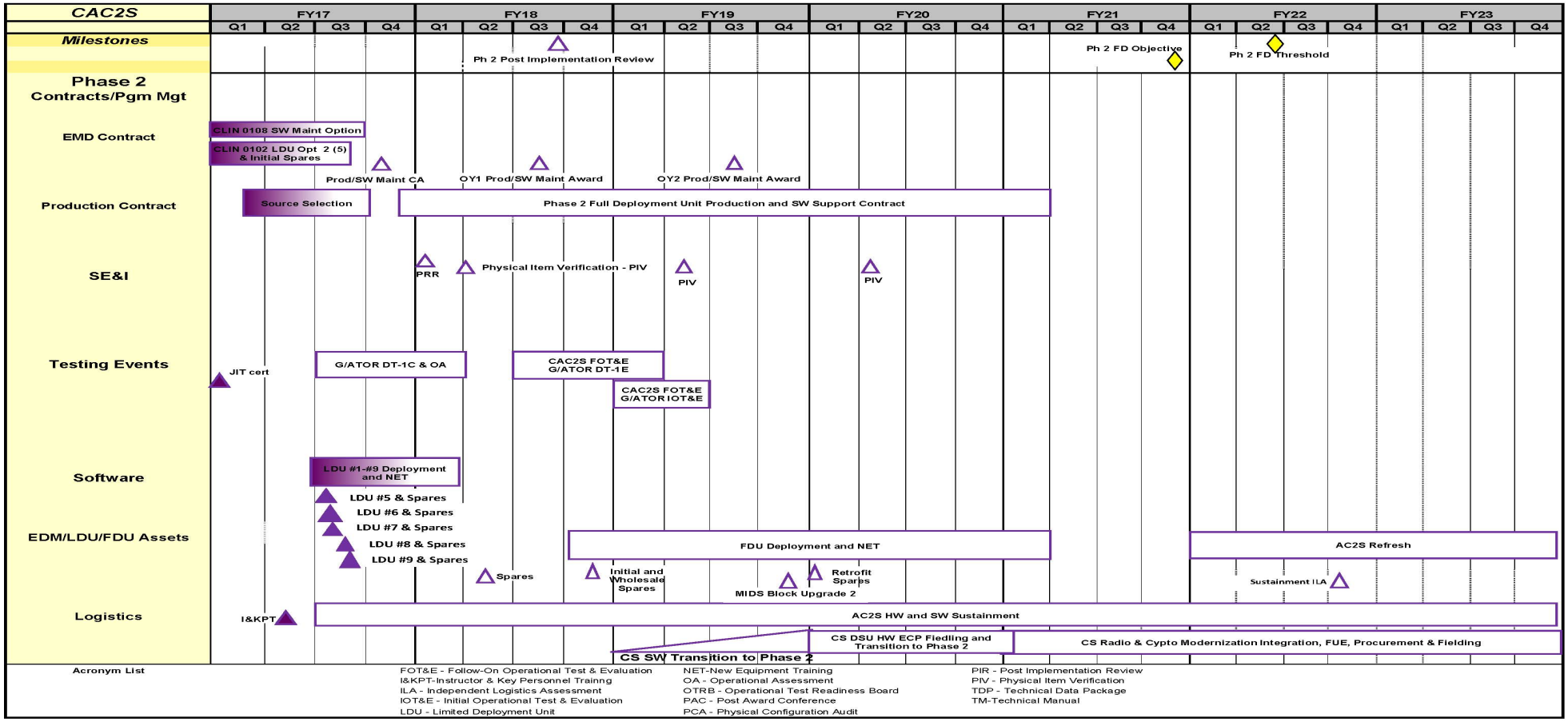


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206335M / *(U)Common Aviation Command and Control Sys (CAC2S)*	**Project (Number/Name)** 3373 / *Common Aviation Command and Control System (CAC2S)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3373				
Full Deployment Unit (FDU) Production Contract	4	2017	1	2021
Communication Subsystem (CS) Hardware Integration and Test	1	2019	4	2019
Limited Deployment Units (LDU) 1-9 deliveries, deployment and NET	3	2017	2	2018
Interoperability Testing for G/ATOR Developmental Test - 1C & Operational Assessment	2	2017	1	2018
Full Deployment Unit (FDU) deployment and NET	4	2018	1	2021
CAC2S Phase 2 FOT&E	3	2018	2	2019
G/ATOR Initial Operational Test & Evaluation	1	2019	2	2019
G/ATOR Developmental Test - 1E	3	2018	1	2019

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206623M *I MC Ground Cmbt Spt Arms 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**
Total Program Element	592.925	45.877	66.009	97.152	-	97.152	127.665	114.933	144.343	190.157	Continuing	Continuing
1555: *Lt Armored Vehicle Prog*	118.207	7.640	13.650	0.000	-	0.000	4.064	5.694	3.160	3.224	Continuing	Continuing
1557: *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*	0.000	0.000	0.000	1.500	-	1.500	15.296	20.544	37.108	77.526	Continuing	Continuing
1901: *MC Grnd Wpnry Prod Improvement*	40.800	2.542	3.512	19.589	-	19.589	36.437	33.393	40.543	40.681	Continuing	Continuing
2086: *Soldier/Marine Enhancement*	30.587	2.328	3.340	3.353	-	3.353	3.640	3.378	3.447	3.517	Continuing	Continuing
2112: *Lightweight 155mm Howitzer*	4.426	0.543	0.000	1.800	-	1.800	2.000	2.000	2.000	2.000	Continuing	Continuing
2237: *Amphibious Vehicle Test*	9.188	1.135	2.861	2.297	-	2.297	2.820	2.886	2.947	3.007	Continuing	Continuing
2315: *Training Devices/ Simulators*	129.886	15.942	23.927	18.328	-	18.328	18.061	22.215	19.279	19.674	Continuing	Continuing
2503: *Initial Issue*	46.258	3.275	4.656	5.412	-	5.412	5.480	5.764	5.852	5.948	Continuing	Continuing
2513: *Body Armor*	48.364	2.712	4.380	4.970	-	4.970	4.773	4.697	4.794	4.892	Continuing	Continuing
2928: *Exp Indirect Fire Gen Supt Wpn Sys*	12.780	1.011	2.990	22.748	-	22.748	22.095	2.143	2.187	2.231	Continuing	Continuing
3098: *Fire Support System*	151.783	8.318	6.145	5.999	-	5.999	7.792	6.868	3.112	3.196	Continuing	Continuing
3774: *Marine Corps Ammo*	0.000	0.000	0.000	1.321	-	1.321	1.306	1.312	1.319	1.334	Continuing	Continuing
3775: *Family of Internally Transportable Vehicles (FITV)*	0.000	0.000	0.000	0.245	-	0.245	2.180	2.183	0.235	0.240	Continuing	Continuing
4002: *Family of Raid Reconnaissance*	0.646	0.431	0.548	9.590	-	9.590	1.721	1.856	18.360	22.687	Continuing	Continuing

A. Mission Description and Budget Item Justification

This PE provides modification to Marine Corps Expeditionary Ground Force Weapon Systems to increase lethality, range, survivability and operational effectiveness. In addition, the PE provides for the development of AAV7A1 reliability, maintainability, operational and safety modifications, improvements in command and control, and product improvements to the family of LAVs. The Amphibious Vehicle Test Branch (AVTB) provides facilities and personnel which perform a broad range of testing,

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206623M *I MC Ground Cmbt Spt Arms Sys*

repair and technical services to amphibious vehicles. This program is funded under Operational Systems Development Program Element (PE) because it encompasses engineering and manufacturing and manufacturing development for upgrades of existing systems.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	51.835	66.009	72.811	-	72.811
Current President's Budget	45.877	66.009	97.152	-	97.152
Total Adjustments	-5.958	0.000	24.341	-	24.341
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	5.080	0.000			
• SBIR/STTR Transfer	-1.060	0.000			
• Program Adjustments	-3.958	0.000	25.301	-	25.301
• Rate/Misc Adjustments	0.000	0.000	-0.960	-	-0.960
• Congressional General Reductions Adjustments	-0.020	-	-	-	-
• Congressional Directed Reductions Adjustments	-6.000	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($6.149) million to account for the availability of prior year execution balances.

The increase of $24.341M in FY19 can be attributed to the first year of development of the Advanced Capability Extended Range Mortar (ACERM) and initiation of the integration and test of an anti-ship missile capability into the USMC HIMARS battalions.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1555 / *Lt Armored Vehicle 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
1555: *Lt Armored Vehicle Prog*	118.207	7.640	13.650	0.000	-	0.000	4.064	5.694	3.160	3.224	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

RDTEN efforts for OB kits complete in FY 2018.

A. Mission Description and Budget Item Justification

The Family of Light Armored Vehicles (FOLAV) consists of six fielded LAV configurations and one communications/intelligence-configured asset on an LAV chassis. The FOLAV provides a logistically self-contained, highly mobile, and lethal combined arms combat system to the Marine Air Ground Task Force (MAGTF). The LAV Product Improvement Program funds modification and sustainment activities and the development and testing of modifications. These programs will ensure that the FOLAV is capable of conducting its assigned missions by enhancing lethality and survivability; reliability, availability, maintainability and durability; as well as reducing operations and support costs.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: LAV Obsolescence (OB)	7.640	13.650	0.000	0.000	0.000
Articles:	8	-	-	-	-
FY 2018 Plans: -Complete modification instruction development, complete 8 vehicle prototype builds, technical manual development, and execute Developmental Testing. -Continue Obsolescence EMD PM support. -Initiate preparation towards Milestone C and preparation for Obsolescence Production Kit contract. Production contract consists of the OB Kits and completion of Logistics Products (technical manuals, provisioning, etc), Training (New Equipment Training, Instructor & Key Personnel Training, etc), Field Service Representative Support, Systems Technical Support, Initial Spares, Special Tools and Test Equipment, Test Vehicle Refurbishment, and Packaging support.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1555 / *Lt Armored Vehicle Prog*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
RDTEN efforts for OB kits complete in FY 2018.					
Accomplishments/Planned Programs Subtotals	7.640	13.650	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
• PMC/2038: *LAV PIP*	32.575	17.244	43.701	-	43.701	61.185	64.837	56.240	60.174	Continuing	Continuing
• PMC/7000: *LAV Spares*	0.628	1.006	5.735	-	5.735	5.884	6.043	6.171	12.604	Continuing	Continuing

Remarks

D. Acquisition Strategy

The LAV Modification & Sustainment program funds important vehicle modifications, support equipment and tools, and other projects that increase LAV reliability and readiness while simultaneously reducing operations and support costs. The Marine Corps Program Management LAV Modification Team uses multi-disciplined integrated project teams consisting of engineering, logistical, contracting and financial personnel to manage Modification projects.

The LAV Obsolescence program(OB) is an ACAT IV(M). The OB program will address the Family of Light Armored Vehicles (FOLAV) automotive system obsolescence and reduced performance due to increased Gross Vehicle Weight (GVW). The OB program will improve fleet reliability and availability by addressing the three sub-systems (power pack, driveline and steering) that specifically account for 95% of total system downtime. Also, fields a modern driver's instrument panel and LAV-25 Slip Ring. This effort will require delivery of 8 kits (7 installed on vehicles, 1 stand-alone kit) during the Engineering & Manufacturing Development (EMD) phase to support Developmental Testing (DT), fielding, Integrated Logistics Support (ILS) products, Modification Instructions (MI) and Engineering Change Proposals (ECP).

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1555 / *Lt Armored Vehicle 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
ILS DATA DEV (OB)	C/CPFF	GDLS : London Ontario, Canada	14.886	1.167	Apr 2017	1.608	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
PRODUCT DEV/ PROTOTYPES (OB)	C/CPFF	GDLS : London Ontario, Canada	35.687	4.565	Apr 2017	5.915	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	37.397	0.000		0.000		0.000		-		0.000	0.000	37.397	-
		Subtotal	87.970	5.732		7.523		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

The decrease from FY18 to FY19 is reduced effort on the Obsolescence 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
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	11.860	0.000		0.000		0.000		-		0.000	0.000	11.860	-
Program Mgmt (OB)	MIPR	TACOM : Warren, MI	9.728	1.749	Dec 2016	2.538	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	21.588	1.749		2.538		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
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	6.105	0.000		0.000		0.000		-		0.000	0.000	6.105	-
Devl/Oper T&E (OB)	MIPR	RTC : AL	1.464	0.129	Nov 2016	3.467	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	7.569	0.129		3.467		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

The decrease from FY18 to FY19 is due to the completed support of the Obsolescence program developmental testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1555 / *Lt Armored Vehicle Prog*	

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
Scheduler (OB)	C/FFP	FEDITC, LLC : Rockville, MD	0.000	0.030	Mar 2017	0.122	Mar 2018	0.000		-		0.000	0.000	0.152	-
Proj 1555: Prior Years Cumulative Funding	Various	N/A : N/A	1.080	0.000		0.000		0.000		-		0.000	0.000	1.080	-
		Subtotal	1.080	0.030		0.122		0.000		-		0.000	0.000	1.232	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	118.207	7.640		13.650		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1555 / *Lt Armored Vehicle Prog*

OB_Summary_Program_Plan_EMD.xlsx

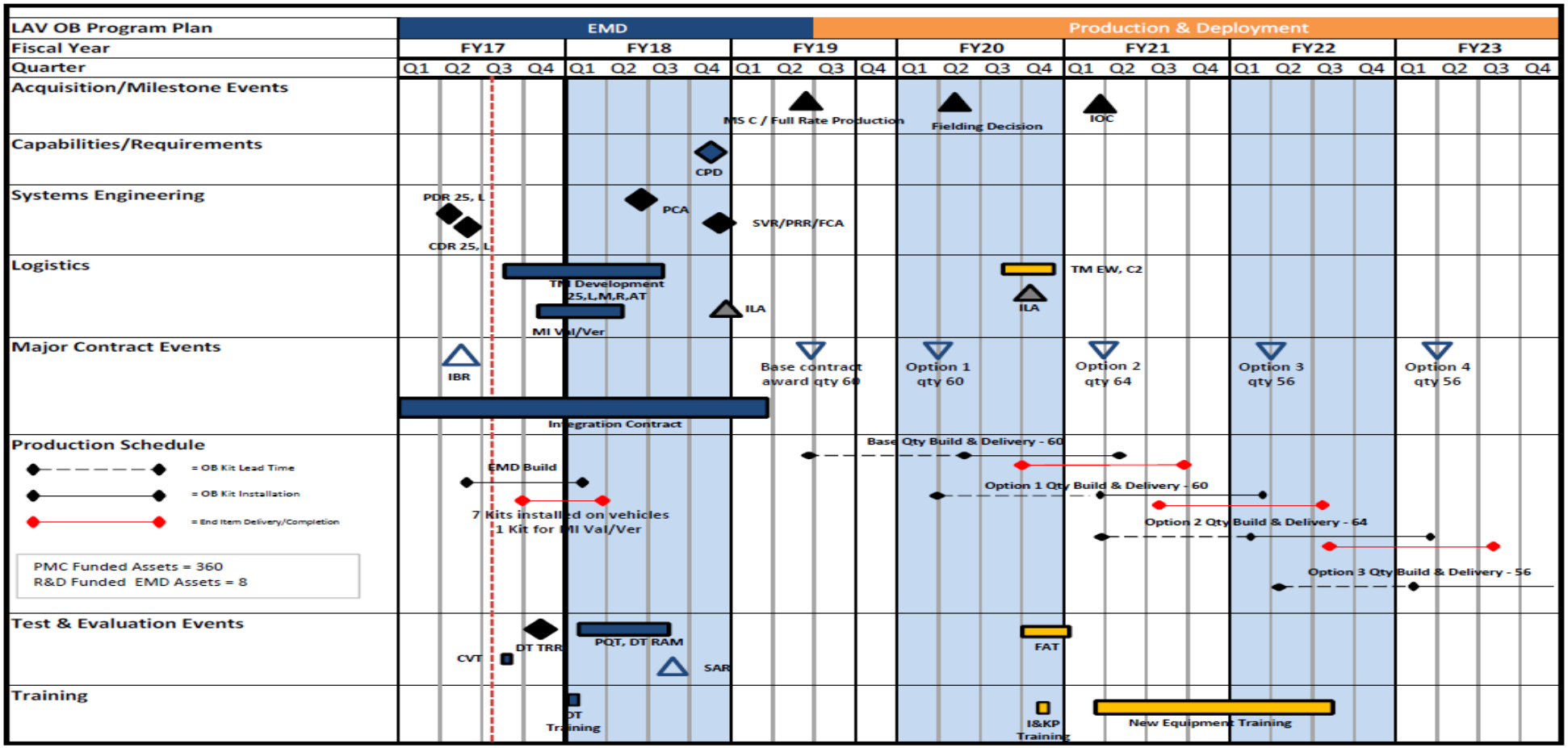


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1555 / *Lt Armored Vehicle Prog*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
LAV Obsolescence				
Integration Contract	1	2017	2	2019
TM Development	3	2017	3	2018
Contractor Verification Test	3	2017	3	2017
EMD Vehicle Delivery	3	2017	1	2018
Developmental Testing	1	2018	3	2018
Mod Instruction Val/Ver	4	2017	2	2018
MS-C	2	2019	2	2019
Base Contract Award	2	2019	2	2019
Option 1 Award	1	2020	1	2020
Fielding Decision	2	2020	2	2020
IOC	1	2021	1	2021
Option 2 Award	1	2021	1	2021
Option 3 Award	1	2022	1	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1557 / *Next Gen Armored Reconnaissance Vehicle (LAV 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
1557: *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*	0.000	0.000	0.000	1.500	-	1.500	15.296	20.544	37.108	77.526	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

This Project is a New Start for FY 2019.

A. Mission Description and Budget Item Justification

The Armored Reconnaissance Vehicle (ARV) is a replacement for the legacy light armored vehicle in the Light Armored Reconnaissance (LAR) battalions within the Marine Divisions. ARV equipped LAR Battalions perform combined arms, all weather, sustained reconnaissance and security missions in support the Ground Combat Element. The ARV is the core capability that underpins the next generation armored reconnaissance capability concept. The ARV will be a modern combat vehicle system, capable of fighting for information, that balances competing capability demands to sense, shoot, move, communicate and remain transportable as part of the naval expeditionary 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: Next Gen Armored Reconnaissance Vehicle (LAV replacement)	0.000	0.000	1.500	0.000	1.500
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: -Initiate analysis of alternatives (AoA) to assess critical technology elements for future Light Armored Reconnaissance capabilities including: technology maturity, integration risk, and manufacturing feasibility. The initial capabilities document (ICD) is currently being developed by HQMC.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The $1.5M increase is due to the initiation of the Next Gen. Armored Reconnaissance Vehicle AoA.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	1.500	0.000	1.500

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1557 / *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Armored Reconnaissance Vehicle (ARV) program will be focused on providing a base combat vehicle capable of meeting evolving threats via open systems architecture and sufficient size, weight, & power (SWAP) to accommodate future growth. Subsequent programs of record will expand the ARV capability to other mission roles and integrate capabilities that emerge from other programs to further develop and enhance LAR operations.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1557 / *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*

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 Mgmt - AoA	MIPR	TBD : Not Specified	0.000	0.000		0.000		1.500	Nov 2018	-		1.500	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.500		-		1.500	Continuing	Continuing	N/A

Remarks

Funding will be used by PM-Light Armored Vehicle (LAV) program office to resource an Analysis of Alternative (AoA) effort for the Armored Reconnaissance Vehicle program.
The funding will be used for program mgmt. in the LAV PM and other Government agency offices.

	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		1.500		-		1.500	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1557 / *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*

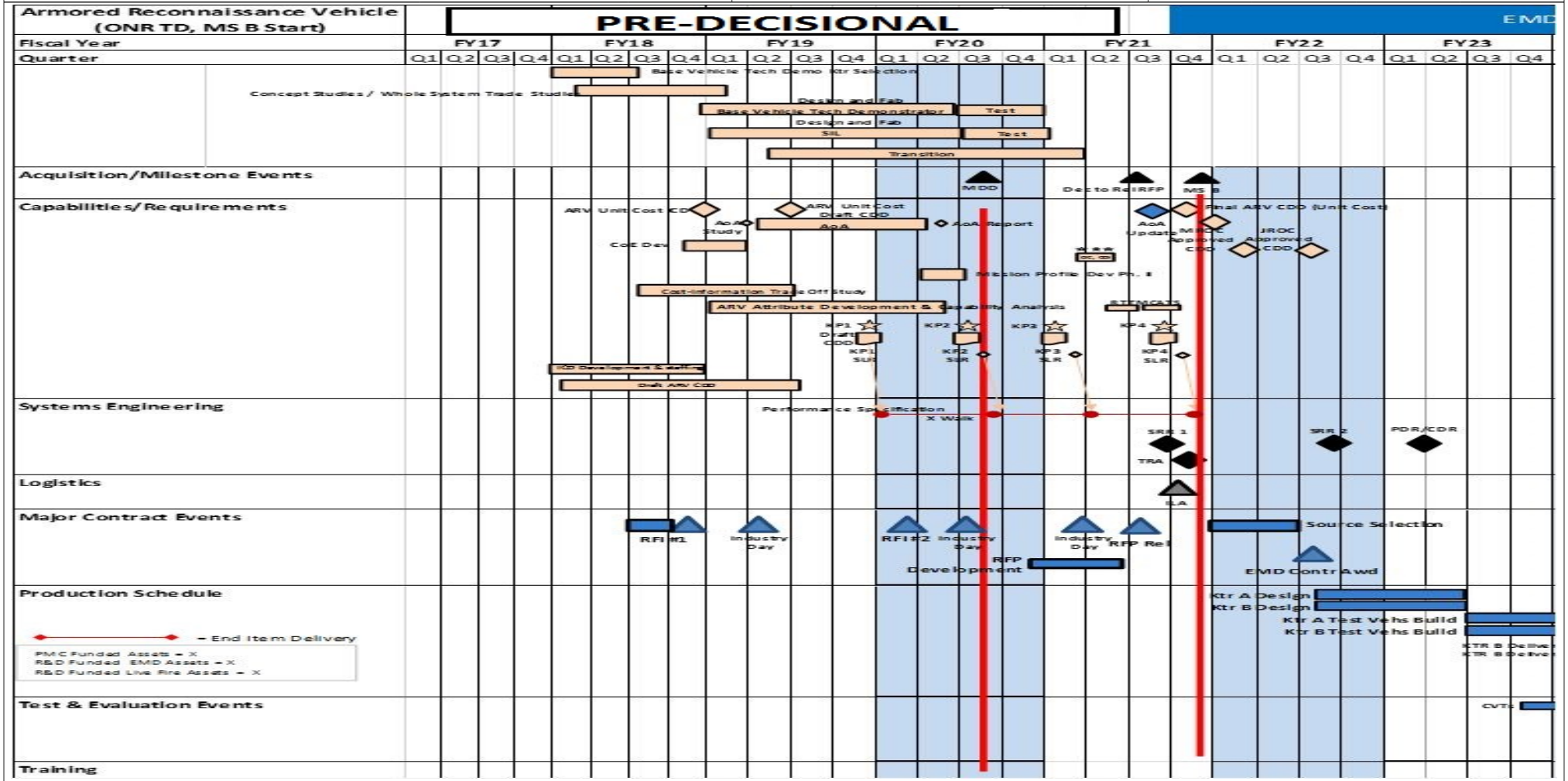


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1557 / *Next Gen Armored Reconnaissance Vehicle (LAV replacement)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 1557				
Armored Reconnaissance Vehicle (ARV) Analysis of Alternatives	2	2019	2	2020
Industry Day #1	2	2019	2	2019
Industry Day #2	3	2020	3	2020
Milestone Decision Document	3	2020	3	2020
RFP Release	3	2021	3	2021
Source Selection	4	2021	2	2022
EMD Contract Award	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1901 / *MC Grnd Wpnry Prod 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
1901: *MC Grnd Wpnry Prod Improvement*	40.800	2.542	3.512	19.589	-	19.589	36.437	33.393	40.543	40.681	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops joint and Marine Corps unique improvements to infantry weapons technology, non-lethal systems technology, improvements for Night Vision Equipment, Rifle Combat Optics, Family of Individual Optics, and monitors national and international weapons developments.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Escalation of Force-Equipment (EoF-E)	0.037	0.085	0.078	0.000	0.078
Articles:	-	-	-	-	-
Description: Escalation of Force Equipment (EoF-E) is a mod funding line to support/sustain all fielded EoF equipment and capabilities. Additionally, EoF-E supports type-classification, testing and procurement of new advancements and technologies to provide an increased capability over existing or obsolescent equipment currently in or associated with the Escalation of Force Mission Modules (EoF-MMs). ***FY 2018 Plans:*** - Continue assessment of upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities. ***FY 2019 Base Plans:*** - Continue assessment of upgrades and replacements to the EoF-MM to sustain/support equipment and capabilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Combat Optics	0.911	1.722	2.927	0.000	2.927
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod 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: Combat Optics is a program that provides for research and development, as well as ammunition to support testing and assessment of optical systems and implementation of modifications for these systems as well as life-cycle management efforts. The research and development of future capabilities include, but are not limited to variable power day optics and, fused/multi-spectral (e.g., combined image intensifier, thermal imaging, and short wave infrared) optical and laser systems. ***FY 2018 Plans:*** -Complete Marine Corps specific evaluation of Squad Thermal System (STS). -Continue technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps. -Initiate evaluation of potential solutions for variable power Squad Common Optic. ***FY 2019 Base Plans:*** - Increase of $1.205M in FY19 is required to initiate product development, test and evaluation, and pre-EMD transition efforts for Advanced Sniper Rifle (ASR) Day and Night Sights. -Continue technology development and evaluation to support life cycle extension and improvement of current optics and inform future optics requirements generation to address capability gaps. -Complete evaluation of potential solutions for variable power Squad Common Optic. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $1.205M in FY19 is required to initiate product development, test and evaluation, and pre-EMD transition efforts for Advanced Sniper Rifle (ASR) Day and Night Sights.					
Title: Company and Battalion Mortars	0.353	0.399	14.686	0.000	14.686
Articles:	-	-	-	-	-
Description: Company and Battalion Mortars is a program that provides for continuous monitoring, research and development, integration and qualification testing, certification and accreditation, assessment and implementation of multi-service and USMC unique system modifications and improvements for mortar and mortar fire control systems. Efforts include advance capability extended range mortar systems and mortar fire control systems using Android operating systems capable of digital communications, mapping and geo-location. ***FY 2018 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Complete system and software development, and demonstration efforts. -Complete Milestone C activities. -Purchase Non-developmental Items (NDI) for testing and evaluation of candidate systems and modifications for Company and Battalion Mortars, and for the development of software for LHMBC. ***FY 2019 Base Plans:*** Advanced Capability Extended Range Mortar (ACERM) Plans: -Type qualify the Extended Range Mortar Ammunition (ERMA) propellant charge for ACERM. ERMA addresses the increased mass of the ACERM cartridge and is compliant with Insensitive Munition requirements. -Develop a Navy Munitions Document (NMD) for ERMA. NMD is required for weapons safety review. -Miniature Mission Setter development and integration with ACERM. ACERM requires a precision weapon pre-launch programming device. -Lightweight Handheld Mortar Ballistic Calculator/Mortar Fire Control Application integration with ACERM. Required to compute aero-ballistic calculations for ACERM. -Design and development of mortar round packaging. Necessary to accommodate ACERM dimensional differences and environmental requirements. Other plans: -Continue LHMBC software upgrades to maintain legacy system configuration baseline. -Complete Mortar Fire Control Application (MFCA) development, qualification testing, certification and accreditation to achieve IOC. -Conduct MFCA integration testing against evolving common Marine Corps hardware solutions. -Initiate development, qualification testing, certification and accreditation of MFCA Increment 2 system Net-Ready key performance parameters required for digital communication, mapping and geo-location services. Purchase Non-Developmental Items (NDI)for testing and evaluation of candidate systems and modifications for company and battalion mortar fire control systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase of $14.3M in FY19 funds the first year of development of the Advanced Capability Extended Range Mortar (ACERM). ACERM is a mortar cartridge designed to extend the maximum range of 81mm high explosive munitions without the use of rocket motors; using high-lift aerodynamics (winged surfaces) instead. The control					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
required to extend the range affords the system precision guidance capability when combined with Global Positioning System and Semi-Active Laser navigation systems. ACERMs precision delivery, combined with a new warhead and fuze, will provide greater lethality at ranges out to 20km.					
Title: Family of Infantry Weapons Systems (FIWS)	1.241	1.306	1.898	0.000	1.898
Articles:	-	-	-	-	-
Description: Family of Infantry Weapons Systems (FIWS) is a program that provides for continuous monitoring, research and development, assessment of and implementation of Joint Service and USMC unique system modifications, as well as new acquisition efforts. Efforts such as: sustain weapon capability, enhance Gunner's Protection Kits (GPK), and improve the performance, maintainability, supportability, service life, ergonomics, and safety enhancements of Infantry Weapons Systems. ***FY 2018 Plans:*** -Continue Product Improvement Program testing for various emergent requirements. -Continue efforts to analyze, design, develop, and field modifications (to include GPKs). -Continue performance evaluation of various types of ammunition currently under development. -Continue product improvement of TGPK and/or TOGPK 2.0 in order to meet requirements outlined in Requirements Memorandum for GPK. -Continue efforts to analyze, design, and develop a Reducible Height GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels. -Continue product improvement of Sniper and Special Purpose systems and their ancillary support equipment in order to meet established or emerging requirements. ***FY 2019 Base Plans:*** Increase of $0.592M from FY18 to FY19 is due to requirements for Advanced Sniper Rifle (ASR) Development effort, and for Infantry Service Rifle Product Improvement Program (PIP). Both the ASR and the Infantry Service Rifle PIP will close capability gaps and increase the lethality of our Infantry Marines. -Continue Product Improvement Program (PIP) testing for various emergent requirements, including Service Rifle PIP, and Advanced Sniper Rifle Development. -Continue efforts to analyze, design, develop, and field modifications (to include GPKs). -Continue performance evaluation of various types of ammunition currently under development. -Continue product improvement of TGPK and/or TOGPK 2.0 in order to meet requirements outlined in Requirements Memorandum for GPK.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Continue efforts to analyze, design, and develop a Reducible Height GPK that meets emergent requirements for vehicle stowage aboard ships while maintaining existing protection levels. -Continue product improvement of Sniper and Special Purpose systems and their ancillary support equipment in order to meet established or emerging requirements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.592M from FY18 to FY19 is due to requirements for Advanced Sniper Rifle (ASR) Development effort, and for Infantry Service Rifle Product Improvement Program (PIP). Both the ASR and the Infantry Service Rifle PIP will close capability gaps and increase the lethality of our Infantry Marines.					
Accomplishments/Planned Programs Subtotals	2.542	3.512	19.589	0.000	19.589

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/2220-01: *Family of Infantry Weapons Systems*	6.036	5.331	28.292	-	28.292	37.894	22.013	32.406	26.789	Continuing	Continuing
• PMC/2220-02: *Company and Battalion Mortars*	0.911	0.810	2.666	-	2.666	3.018	3.474	3.543	5.614	Continuing	Continuing
• PMC/2220-03: *Escalation of Force - Equip (EoF-E)*	2.898	1.748	1.099	-	1.099	1.426	1.454	1.483	1.513	Continuing	Continuing
• PMC/4620: *Combat Optics*	10.978	12.793	59.052	-	59.052	59.256	59.443	53.266	53.463	0.000	359.949

Remarks

D. Acquisition Strategy

These programs range from off-the-shelf modifications to developmental items for safety, reliability, and technology upgrades to meet Marine Corps requirements.

Family of Infantry Weapons Systems (FIWS):

The FIWS program strategy is to explore, research and recommend efforts to address and identify solutions to performance, reliability and safety design issues through various means, including commercial off-the-shelf (COTS) components. This includes efforts to improve Individual and Crew Served Weapon Systems, develop Gunner

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

Protection Kits (GPK), evaluation of various types of ammunition under development, and testing of Product Improvement Programs in order to meet various emergent requirements.

Combat Optics:

Combat Optics acquisition, management and contracting strategies support the research, development, modification and improvement of optics, night vision and laser systems such as magnified day optics, thermal imagers, image intensifying (I2) systems, lasers, and illuminators.

Company and Battalion Mortars Acquisition Strategy:

Acquisition, management and contracting strategies support multiservice and USMC unique system modifications and improvements for the lightweight company and battalion mortars and mortar fire control systems to provide immediate indirect fires in support of mounted and dismounted forces to the company and battalion level. Efforts include: 1) transition the Advanced Capability Extended Range Mortar (ACERM), developed/demonstrated by the Office of Naval Research, to extend the maximum range and precision of 81mm high explosive munitions and provide greater lethality at ranges out to 20 km, and 2) an Android-based Mortar Fire Control Application (MFCA) allowing mortar crews to send and receive digital call-for-fire messages, calculate ballistic solutions, and navigate.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1901 / *MC Grnd Wpnry Prod 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
Company and Battalion Mortars	MIPR	Picatinny Arsenal : Picatinny, NJ	2.369	0.353	Jul 2017	0.399	May 2018	3.208	Feb 2019	-		3.208	Continuing	Continuing	Continuing
Company and Battalion Mortars	WR	NSWC, Crane : Crane, IN	0.000	0.000		0.000		7.850	Feb 2019	-		7.850	0.000	7.850	-
Company and Battalion Mortars	WR	NSWC, Dahlgren : Dahlgren, VA	0.000	0.000		0.000		3.628	Feb 2019	-		3.628	0.000	3.628	-
Family of Infantry Weapons Systems	Various	DLA : Philadelphia, PA	0.432	0.019	Apr 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Escalation of Force Equipment	Various	NSWC, Crane : Crane, IN	0.614	0.037	May 2017	0.000		0.000	May 2019	-		0.000	0.000	0.651	-
Family of Infantry Weapons Systems	MIPR	ARDEC : Picatinny, NJ	0.621	0.200	Jun 2017	0.000		1.000	Mar 2019	-		1.000	0.000	1.821	-
Family of Infantry Weapons Systems	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.479	Sep 2018	0.000		-		0.000	0.000	0.479	-
Family of Infantry Weapons Systems	WR	NSWC : Crane, IN	0.000	0.000		0.000		0.250	Apr 2019	-		0.250	0.000	0.250	-
Combat Optics	MIPR	NSWC : Dahlgren, VA	0.000	0.000		0.000		1.782	Mar 2019	-		1.782	0.000	1.782	-
Combat Optics	Various	MCSC : Quantico, VA	2.545	0.000		0.906	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Combat Optics	MIPR	Night Vision Lab : Ft. Belvoir, VA	3.273	0.000		0.000		0.000		-		0.000	0.000	3.273	-
Combat Optics	Various	MCSC : Travel	0.014	0.000		0.010	Jan 2018	0.000		-		0.000	0.000	0.024	-
Proj 1901: Prior Years Cum Funding (Product Dev)	Various	Various : Various	1.108	0.000		0.000		0.000		-		0.000	0.000	1.108	-
		Subtotal	10.976	0.609		1.794		17.718		-		17.718	Continuing	Continuing	N/A

Remarks

Increase of $15.924M is primarily due to this being the first year of development of the Advanced Capability Extended Range Mortar (ACERM).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

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
Company and Battalion Mortars	WR	NSWC : Dahlgren, VA	0.155	0.000		0.000		0.000		-		0.000	0.000	0.155	-
Family of Infantry Weapons Systems	Various	Travel/IMPAC : Quantico, VA	0.296	0.118	Nov 2017	0.151	Sep 2018	0.145	Aug 2019	-		0.145	Continuing	Continuing	Continuing
Family of Infantry Weapons Systems	WR	NSWC : Dahlgren, VA	0.000	0.052	Apr 2017	0.000		0.000		-		0.000	0.000	0.052	-
Combat Optics	C/FFP	MCSC : Quantico, VA	1.852	0.000		0.080	May 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Combat Optics	WR	NSWC : Crane, IN	0.470	0.369	Jul 2017	0.476	Dec 2017	0.257	Jul 2019	-		0.257	Continuing	Continuing	Continuing
Proj 1901: Prior Years Cum Funding (Support)	Various	Various : Various	11.649	0.000		0.000		0.000		-		0.000	0.000	11.649	-
		Subtotal	14.422	0.539		0.707		0.402		-		0.402	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
Family of Infantry Weapons Systems	WR	LogCom : Albany, GA	0.004	0.000		0.000		0.000		-		0.000	0.000	0.004	-
Family of Infantry Weapons Systems	MIPR	Aberdeen Test Center : Aberdeen, MD	1.128	0.000		0.000		0.000		-		0.000	0.000	1.128	-
Family of Infantry Weapons Systems	Reqn	MCSC Supply : Quantico, VA	0.017	0.000		0.000		0.000		-		0.000	0.000	0.017	-
Combat Optics	WR	NSWC : Crane, IN	0.000	0.184	Nov 2016	0.000		0.000		-		0.000	0.000	0.184	-
Combat Optics	MIPR	Army : Fort Belvoir, VA	0.000	0.109	Sep 2017	0.000		0.000		-		0.000	0.000	0.109	-
Family of Infantry Weapons Systems	WR	NSWC Crane : Crane, IN	0.620	0.255	May 2017	0.246	Dec 2017	0.399	Jan 2019	-		0.399	Continuing	Continuing	Continuing
Family of Infantry Weapons Systems	WR	NSWC : Crane, IN	0.194	0.258	Jun 2017	0.150	Dec 2017	0.000		-		0.000	0.000	0.602	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1901 / *MC Grnd Wpnry Prod Improvement*	

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
Combat Optics	MIPR	DLA : Philadelphia, PA	0.000	0.249	Nov 2016	0.000		0.892	Mar 2019	-		0.892	0.000	1.141	-
Family of Infantry Weapons Systems	WR	PM Ammo : Quantico, VA	0.015	0.000		0.000		0.000		-		0.000	0.000	0.015	-
Family of Infantry Weapons Systems	WR	NSWC : Dahlgren, VA	0.000	0.010	Jul 2017	0.000		0.000		-		0.000	0.000	0.010	-
Family of Infantry Weapons Systems	C/FFP	NSWC-DD : Dahlgren, VA	0.000	0.086	Aug 2017	0.000		0.000		-		0.000	0.000	0.086	-
Family of Infantry Weapons Systems	WR	ARL-PSU : State College, PA	0.273	0.000		0.000		0.000		-		0.000	0.000	0.273	-
Combat Optics	WR	PM Ammo : Quantico, VA	0.160	0.000		0.000		0.000		-		0.000	0.000	0.160	-
Proj 1901: Prior Years Cum Funding (T&E Eval)	Various	Various : Various	11.280	0.000		0.000		0.000		-		0.000	0.000	11.280	-
		Subtotal	13.691	1.151		0.396		1.291		-		1.291	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
Family of Infantry Weapons Systems	C/FFP	MCSC : Quantico, VA	0.684	0.243	May 2017	0.280	Mar 2018	0.050	Mar 2019	-		0.050	Continuing	Continuing	Continuing
Combat Optics	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.250	Mar 2018	0.050	Mar 2019	-		0.050	0.000	0.300	-
Escalation of Force Equipment	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.085	Mar 2018	0.078	Mar 2019	-		0.078	0.000	0.163	-
Proj 1901: Prior Years Cum Funding (Mgmt Services)	Various	Various : Various	1.027	0.000		0.000		0.000		-		0.000	0.000	1.027	-
		Subtotal	1.711	0.243		0.615		0.178		-		0.178	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 1901 / *MC Grnd Wpnry Prod Improvement*	

	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	40.800	2.542		3.512		19.589		-		19.589	Continuing	Continuing	N/A

Remarks

Increase of $16.077M is primarily due to this being the first year of development of the Advanced Capability Extended Range Mortar (ACERM).

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

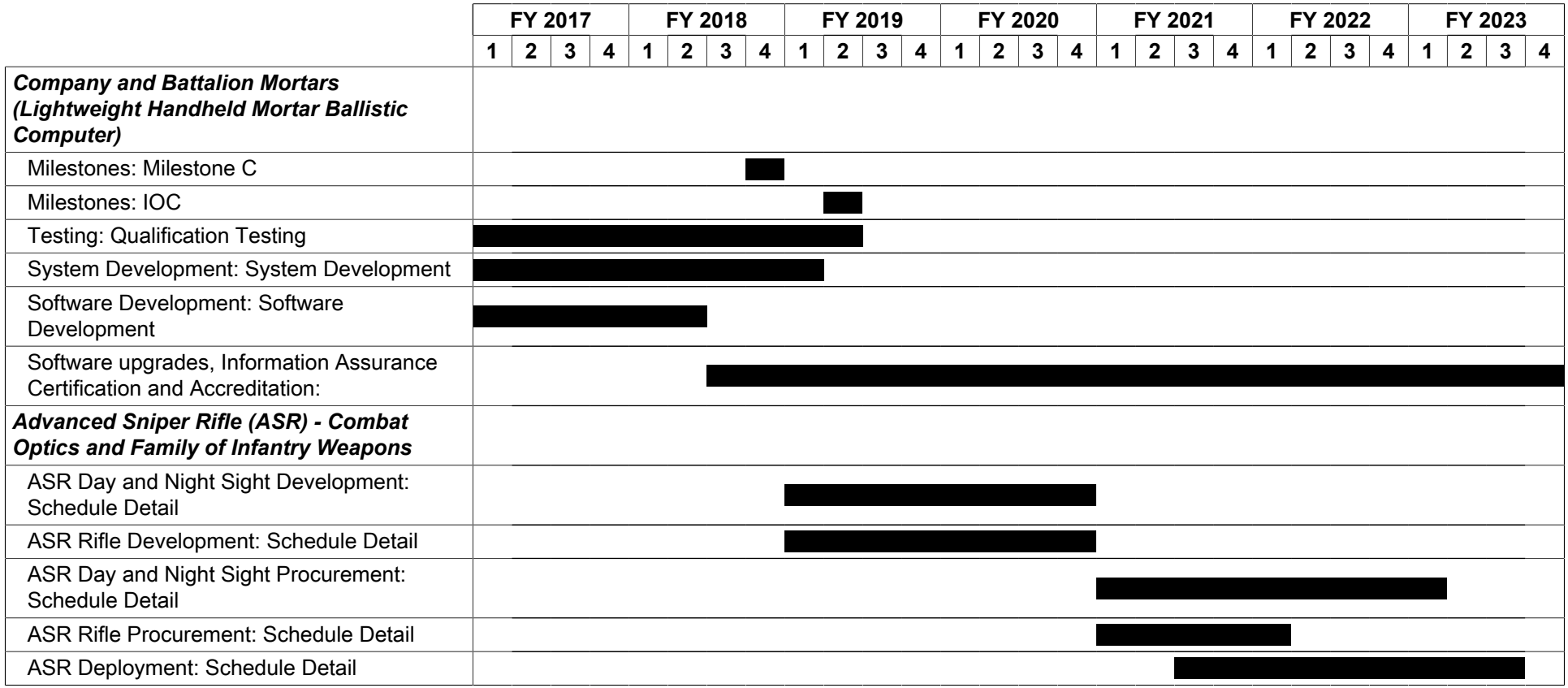


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 1901 / *MC Grnd Wpnry Prod Improvement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Company and Battalion Mortars (Lightweight Handheld Mortar Ballistic Computer)				
Milestones: Milestone C	4	2018	4	2018
Milestones: IOC	2	2019	2	2019
Testing: Qualification Testing	1	2017	2	2019
System Development: System Development	1	2017	1	2019
Software Development: Software Development	1	2017	2	2018
Software upgrades, Information Assurance Certification and Accreditation:	3	2018	4	2023
Advanced Sniper Rifle (ASR) - Combat Optics and Family of Infantry Weapons				
ASR Day and Night Sight Development: Schedule Detail	1	2019	4	2020
ASR Rifle Development: Schedule Detail	1	2019	4	2020
ASR Day and Night Sight Procurement: Schedule Detail	1	2021	1	2023
ASR Rifle Procurement: Schedule Detail	1	2021	1	2022
ASR Deployment: Schedule Detail	3	2021	3	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2086 / *Soldier/Marine Enhancement*	

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
2086: *Soldier/Marine Enhancement*	30.587	2.328	3.340	3.353	-	3.353	3.640	3.378	3.447	3.517	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Marine Expeditionary Rifle Squad (MERS) mission is to manage the infantry squad, "squad as a system", by conducting integration, systems engineering, human factors, and modernization efforts across all the products that are worn, carried, and consumed by the rifle squad. Physical integration, capability analysis, modeling and simulation, ergonomics, and usability assessments are facilitated by this program in working with the various program managers and project officers in the development of their unique items that contribute to the squads overall capabilities. MERS operates and manages the Gruntworks Squad Integration Facility, including facilities sustainment, restoration and modernization of the facility, to meet mission requirements in order to support integration and assessments of equipment. MERS is engaging industry and academia in search of innovative technologies that can enhance infantry capabilities via a Partnership Intermediary Agreement. Weight and volume management are fundamental considerations in the insertion or modernization of any squad equipment. MERS works with Joint and NATO soldier modernization programs to harvest new technologies to increase the capability of the rifle squad. The program also ensures the integration of the rifle squad into the various mobility platforms currently in service and being developed to ensure a Marine and his equipment can operate effectively. The Marine Corps anthropometry survey will be initiated in FY18 for completion in FY20. This program is essential to ensure the combined synergistic equipment effects enhance the war-fighting functions of the Marine rifle squad towards the strategic Marine Corps war fighting vision for the future.

Ammunition Life Cycle Management Program responsibility for Total Life Cycle Management for ground conventional munitions. Accordingly, PM Ammo is a member of the joint services Ammunition Logistics Research and Development IPT (ALR&D IPT). Each year the IPT solicits R&D projects from all of the services. The IPT looks for innovative ideas to enhance logistical support for munitions. Approximately 20 Ammo Logistics R&D projects are voted on each year by the IPT. They are prioritized by voting actions of the Senior Review Board and funding sources are identified. Since the funding for ammunition procurement is outpaced by annual expenditures, ammunition logistics R&D projects designed to extend the shelf life of our current inventory, provide enhanced packaging to "lighten the load" of our munitions, and other such projects will go a long way to ensure the Marine Corps can maintain combat readiness with a reliable conventional ammunition inventory into the 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: Marine Expeditionary Rifle Squad (MERS)	2.019	2.731	3.353	0.000	3.353
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

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 resource improvements and operating costs to support the mission of Gruntworks Squad Integration Facility. This includes resourcing minor construction for facilities sustainment, restoration and modernization efforts, below the MILCON threshold. -Continue to utilize the Gruntworks Squad Integration Facility as an asset to execute innovation and technology searches and projects, R&D integration projects, prototyping, rapid assessment of technologies, and usability trials. -Continue investment into Gruntworks Squad Integration Facility enablers and capabilities. -Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics. -Continue to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level. -Continue to support integration of body armor and load bearing systems with human factors expertise. -Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program and associated Policy Letters and Requirements Documents. -Continue to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms. -Continue to conduct R&D on squad systems in conjunction with Army squad system projects. -Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment. -Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment. -Continue to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability. -Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components. -Continue to implement capability requirements from MERS Initial Capabilities Document (ICD). -Continue to prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as mechanism to pursue innovation and technology. -Continue Marine Corps anthropometry survey in order to provide an updated database in 2020. ***FY 2019 Base Plans:*** -Continue to support all the Marine Corps Systems Command program offices that provide equipment to the Marine rifle squad or provide mobility platforms that support the squad.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

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 resource improvements and operating costs to support the mission of Gruntworks Squad Integration Facility. This includes resourcing minor construction for facilities sustainment, restoration and modernization efforts, below the MILCON threshold. -Continue to utilize the Gruntworks Squad Integration Facility as an asset to execute innovation and technology searches and projects, R&D integration projects, prototyping, rapid assessment of technologies, and usability trials. -Continue investment into Gruntworks Squad Integration Facility enablers and capabilities. -Continue to conduct human performance trials utilizing MC-LEAP and other data collection methodologies in order to develop mobility metrics. -Continue to conduct usability trials, requirements generation workshops, and limited user evaluations for digital interoperability, handheld devices and applications at the infantry platoon and squad level. -Continue to support integration of body armor and load bearing systems with human factors expertise. -Continue to conduct mobility experiments using the Marine Corps Load Effects Assessment Program and associated Policy Letters and Requirements Documents. -Continue to develop integrated seating solutions for combat equipped Marines for ACV 1.1, ACV 1.2, JLTV and other mobility programs and synchronize seat belt and retention systems among the platforms. -Continue to conduct R&D on squad systems in conjunction with Army squad system projects. -Continue to conduct surveys with post deploying infantry battalions on usability and integration of equipment utilized during deployment. -Continue to conduct human performance testing of Marines utilizing current and prototype configurations of infantry rifle squad equipment. -Continue to evaluate and transition technologies from ONR and other S&T activities that enhance capabilities of the squad or provide a desired capability. -Continue to seek weight and volume reduction replacements for current infantry equipment that support integration of components. -Continue to implement capability requirements from MERS Initial Capabilities Document (ICD). -Continue to prioritize projects with the Infantry Working Group and utilize the Partnership Intermediary Agreement as mediation to pursue innovation and technology. -Continue Marine Corps anthropometry survey in order to provide an updated database in 2020.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

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 from FY18 to FY19 of $.0622M supports additional integration and prototyping initiatives as digital interoperability to the squad will require significant effort. In addition, the Infantry Working Group will focus on prototyping 5th generation Marine/Squad capabilities based on requirements identified in FY18.					
Title: Ammunition Life Cycle Management ***Articles:*** ***FY 2018 Plans:*** - Continue to support the Ammunition Logistics R&D IPT by funding the Propellant Temperature project, Emergency Resupply project, thermoformed dunnage project, automated site planning project, and the Logistics Study for Additive Manufacturing (3D) printing project. ***FY 2019 Base Plans:*** Funds transferred to Project C3774. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease of $.609 is due to funding being transferred to Project C3774 Marine Corps Ammo	0.309 -	0.609 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	2.328	3.340	3.353	0.000	3.353

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Non Developmental Item/Commercial off the Shelf (NDI/COTS).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2086 / *Soldier/Marine Enhancement*	

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
MERS Product Development	Various	Marine Corps Systems Command : Quantico, VA	0.000	0.000		0.000		0.750	Sep 2019	-		0.750	0.000	0.750	-
Prior Years Cumulative Funding	Various	Marine Corps Systems Command : Quantico, VA	12.792	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	12.792	0.000		0.000		0.750		-		0.750	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
MERS Support	Various	Marine Corps Systems Command : Quanico, VA	0.926	0.000		0.000		0.000		-		0.000	0.000	0.926	-
Ammunition Life Cycle Management	MIPR	Defense Ammo Ctr : McAlester, OK	0.492	0.036	Jan 2017	0.000		0.000		-		0.000	0.000	0.528	-
Ammunition Life Cycle Management	WR	NSWC : Indian Head, MD	0.446	0.273	Jan 2017	0.000		0.000		-		0.000	0.000	0.719	-
Ammunition Life Cycle Management	MIPR	ARDEC : Picatinny Arsenal, NJ	0.000	0.000		0.609	Mar 2018	0.000		-		0.000	0.000	0.609	-
MERS Technical Support	C/IDIQ	Various : Various	0.000	0.320	Mar 2018	0.394	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
MERS Technical Support - PIA	C/CPFF	MCSC : Quantico, VA	0.000	1.128	Jan 2018	1.200	Jan 2018	1.900	Dec 2018	-		1.900	0.000	4.228	Continuing
Ammunition Life Cycle Management	MIPR	US Army SMCA : Picatinny, NJ	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
MERS Technical Support	C/CPFF	MCSC : Quantico, VA	0.000	0.000		0.600	Feb 2018	0.000		-		0.000	0.000	0.600	Continuing
Ammunition Life Cycle Management	WR	NSWC : Crane, IN	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
MERS Prior Years Cumulative Funding	Various	Various : Various	4.257	0.000		0.000		0.000		-		0.000	0.000	4.257	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

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	6.121	1.757		2.803		1.900		-		1.900	Continuing	Continuing	N/A

Remarks

Various contracts, MIPRS, Work Requests and Supply Requisitions are awarded through the year for the various initiatives in the MERS programs. Contract method reflects where the majority of the funding is allocated. Contract award date reflects the first of multiple awards.

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
MERS Developmental Test & Eval	C/FFP	AFRL : WPAFB	0.454	0.000	Nov 2016	0.000		0.000		-		0.000	0.000	0.454	-
MERS Developmental Test & Eval	C/FFP	MCSC : TBD	0.255	0.140	Feb 2018	0.285	Feb 2018	0.000		-		0.000	0.000	0.680	-
MERS Developmental Test & Eval	MIPR	AFB : Hanscom	0.200	0.091	May 2018	0.112	Apr 2018	0.120	Dec 2018	-		0.120	0.000	0.523	-
MERS Developmental Test & Eval (Articles)	C/FFP	MCSC : Quantico, VA	0.000	0.150	May 2018	0.140	Feb 2018	0.121	Jul 2019	-		0.121	0.000	0.411	-
MERS Developmental Test & Eval	C/FFP	MCSC : Quantico, VA	0.000	0.190	Mar 2018	0.000		0.462	Feb 2019	-		0.462	0.000	0.652	-
MEP Developmental Test & Eval	C/FFP	MCSC : TBD	5.346	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MERS Prior Years Cumulative Funding	C/FFP	MITLLTech : Lexington, MA	5.419	0.000		0.000		0.000		-		0.000	0.000	5.419	-
		Subtotal	11.674	0.571		0.537		0.703		-		0.703	Continuing	Continuing	N/A

Remarks

Various contracts, MIPRS, Work Requests and Supply Requisitions are awarded through the year for the various initiatives in the MEP and MERS programs, therefore a specific contract award date cannot be identified. Contract award date reflects the first of multiple awards.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2086 / *Soldier/Marine Enhancement*	

	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	30.587	2.328		3.340		3.353		-		3.353	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

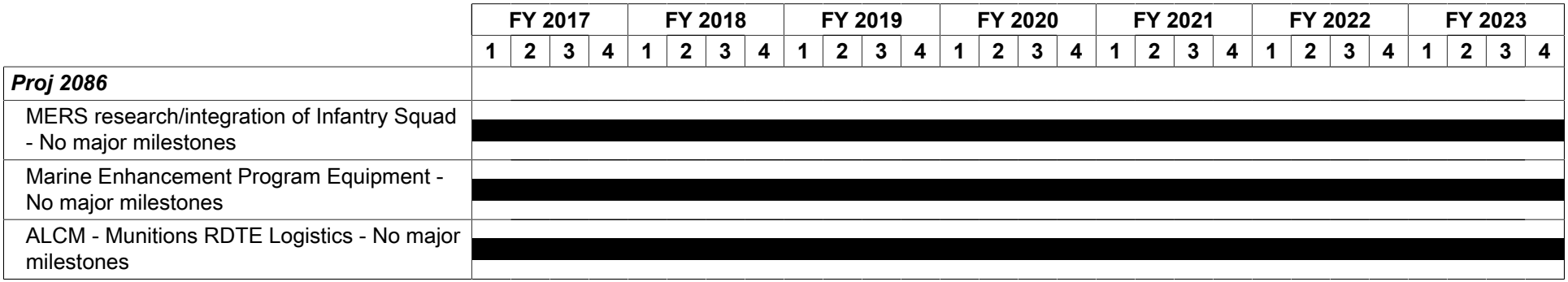


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2086 / *Soldier/Marine Enhancement*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2086				
MERS research/integration of Infantry Squad - No major milestones	1	2017	4	2023
Marine Enhancement Program Equipment - No major milestones	1	2017	4	2023
ALCM - Munitions RDTE Logistics - No major milestones	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2112 / *Lightweight 155mm Howitzer*	

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
2112: *Lightweight 155mm Howitzer*	4.426	0.543	0.000	1.800	-	1.800	2.000	2.000	2.000	2.000	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

LW155 (also known as the M777A2 howitzer) provides direct, reinforcing, and general support fires to maneuver forces as well as direct support artillery. It is a joint program between the Marine Corps and Army, which is additionally supporting various foreign military purchases of the weapon system. The LW155 was first fielded by the Marine Corps in April 2005 and since then the 10th, 11th, 12th, and 14th Marines and the schoolhouses have been fielded. The Army has fielded the system to its Stryker Brigades and Fires Brigades and is currently fielding to its Infantry Brigades. The LW155 is being significantly utilized in 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: Lightweight 155mm Howitzer Product Improvements	0.543	0.000	1.800	0.000	1.800
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: -Initiate acquisition of prototyped hardware components.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY18 to FY19 increase of $1.800M provides for hardware components for M777 Extended Range objective prototyping (i.e., to extend the range of artillery), in support of the system demonstration in FY21.					
Accomplishments/Planned Programs Subtotals	0.543	0.000	1.800	0.000	1.800

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
• 2185: *155MM Ltwt Towed Howitzer*	17.318	20.259	47.158	-	47.158	26.065	0.072	0.074	0.075	0.000	1,440.282

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2112 / *Lightweight 155mm Howitzer*

D. Acquisition Strategy

Production and fielding of the LW155 has concluded and has now entered into the Sustainment Life Cycle Phase. However, the program will continue, in coordination with its partners, to perform research and development to remedy obsolescence issues, diminishing manufacturing sources, technical issues and emergent threats as well as investigate technologies to extend the range of USMC artillery to enhance operational capabilities and engage the threat at greater distances.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2112 / *Lightweight 155mm Howitzer*	

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
LW155 Product Improvements	MIPR	ARDEC : Picatinny Arsenal, NJ	4.426	0.543	Aug 2017	0.000		1.800	Oct 2018	-		1.800	Continuing	Continuing	Continuing
		Subtotal	4.426	0.543		0.000		1.800		-		1.800	Continuing	Continuing	N/A

Remarks

FY17 funding provided for the M777 Extended Range Muzzle Brake prototyping.
FY19 funding provided for M777 Extended Range objective hardware prototyping for system demonstration in FY21.

	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	4.426	0.543		0.000		1.800		-		1.800	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2112 / *Lightweight 155mm Howitzer*

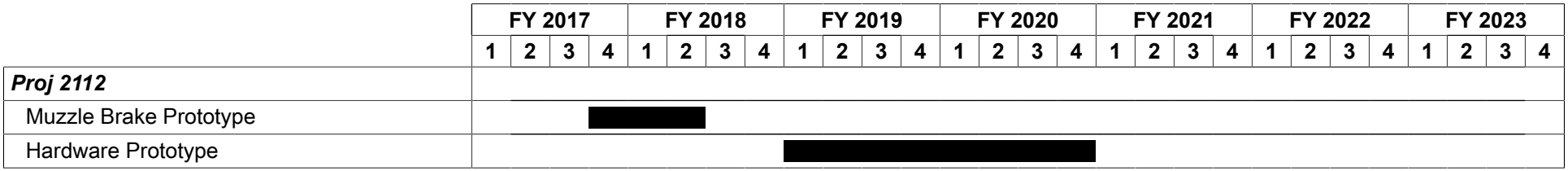


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2112 / *Lightweight 155mm Howitzer*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2112				
Muzzle Brake Prototype	4	2017	2	2018
Hardware Prototype	1	2019	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2237 / *Amphibious Vehicle Test*	

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
2237: *Amphibious Vehicle Test*	9.188	1.135	2.861	2.297	-	2.297	2.820	2.886	2.947	3.007	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Amphibious Vehicle Test Branch (AVTB) is a component of Marine Corps Systems Command (MCSC) and is responsible for the operation and management of the amphibious vehicle test facility, which is the Department of Defense's only certified amphibious vehicle test capability. The AVTB generates test plans, executes, analyzes and reports results of developmental and integrated test and evaluation events. They predominately support the development and performance validation of amphibious and ground combat vehicle system capabilities. The AVTB conducts and supports testing for the MCSC; Navy PEOs and Program Management Offices; the Office of Naval Research; and HQMC PP&O and CD&I, as directed. The AVTB mission is to plan, execute, analyze and report developmental and integrated test and evaluation of USMC and Joint Service tracked, wheeled and ground combat vehicles and other demonstration events in order to characterize the performance of amphibious and ground combat vehicle systems and enable informed acquisition decisions for the future warfighting 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: Contracts and Test and Evaluation Support Assets	1.135	2.861	2.297	0.000	2.297
Articles:	-	-	-	-	-
FY 2018 Plans: -Finalize AAV Survivability Upgrade DT&E.(EMD Phase) -Finalize ACV 1.1 Baseline, DT&E, and RGT.(EMD Phase) -Provide support for ACV 1.1 operation tests.(EMD Phase) -Commence AAV Survivability Upgrade Test Readiness Review, Water Mobility testing, and Reliability Qualification Testing.(PD Phase) -Commence ACV 1.1 Test Readiness Review. (PD Phase) -Commence ACV 1.1 DT&E (PD Phase) -Continue LAV-OB variant water testing. -Continue to test other MCSC, Navy PEOs, and Joint Service programs.					
FY 2019 Base Plans: -Finalize AAV Survivability Upgrade Water Mobility testing.(PD Phase) -Provide support for AAV Survivability Upgrade operation tests (IOT&E.).(PD Phase) -Finalize ACV 1.1 Test Readiness Review -Commence ACV 1.1 Water Mobility testing, Communications Testing, Supportability/Human Factor testing, and Reliability Qualification Testing.(PD Phase)					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2237 / *Amphibious Vehicle Test*

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 test other MCSC, Navy PEOs, and Joint Service programs. ***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	1.135	2.861	2.297	0.000	2.297

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Work will be led in-house by the Amphibious Vehicle Test Branch (AVTB). As DoD's only certified amphibious test and evaluation capability, AVTB will provide technical and user information regarding the performance of amphibious and ground combat vehicles during developmental testing,capabilities demonstrations and assessments, integrated and follow-on test evaluations events for Marine Corps and Joint Service Program Managers of system activities to support future warfighting capabilities. Required DT&E test assets will be resourced organically with military and civilian personnel, and as required contracted by the MCSC, such as boat operations and maintenance, professional data collection and reduction, test instrumentation and test-peculiar programming and technical writing.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2237 / *Amphibious Vehicle Test*	

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 Years Cumulative FUnding	Various	Various : Various	2.430	0.000		0.000		0.000		-		0.000	0.000	2.430	-
		Subtotal	2.430	0.000		0.000		0.000		-		0.000	0.000	2.430	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
Facility/Test Infrastucture	C/FFP	NAVFAC, SW : Camp Pendleton, CA	0.403	0.080	May 2017	0.087	Oct 2017	0.250	Oct 2018	-		0.250	Continuing	Continuing	Continuing
Test Assets/Boat Operators	C/FFP	MCTSSA Camp Pend : Camp Pendleton, CA	0.637	0.000	Apr 2017	0.682	Apr 2018	0.664	Dec 2018	-		0.664	0.000	1.983	-
Test Assets/AAV Operators	C/FFP	MCTSSA Camp Pend : Camp Pendleton CA	0.624	0.000	Apr 2017	0.666	Apr 2018	0.648	Dec 2018	-		0.648	0.000	1.938	-
Vehicle Support	WR	RCO Camp Pendleton : Camp Pendleton, CA	0.065	0.000	Oct 2016	0.107	Oct 2017	0.070	Oct 2018	-		0.070	Continuing	Continuing	Continuing
Hazmat POL PPE	Various	MCTSSA Camp Pendleton : Camp Pendleton, CA	0.290	0.040	Oct 2016	0.055	Oct 2017	0.060	Oct 2018	-		0.060	0.000	0.445	-
Crane Test Support	C/IDIQ	MCTSSA Camp Pendleton : Camp Pendleton, CA	0.085	0.000	Jun 2017	0.085	Jun 2018	0.065	Jun 2019	-		0.065	0.000	0.235	-
Test article fuel (J8)	Various	AVTB : Camp Pendleton, CA	0.500	0.181	Oct 2016	0.150	Oct 2017	0.064	Oct 2018	-		0.064	0.000	0.895	-
Test support Fuel (Deisel)	Various	AVTB : Camp Pendleton, CA	0.450	0.150	Oct 2016	0.070	Oct 2017	0.000	Oct 2018	-		0.000	0.000	0.670	-
Dive Team Support	C/CPFF	MCTSSA : Camp Pendleton, CA	0.000	0.150	Dec 2016	0.096	Mar 2018	0.000	Dec 2018	-		0.000	0.000	0.246	-
		Subtotal	3.054	0.601		1.998		1.821		-		1.821	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2237 / *Amphibious Vehicle Test*

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 Article Ops & Main	Various	AVTB : Camp Pendelton, CA	1.348	0.085	Oct 2016	0.150	Oct 2017	0.080	Oct 2018	-		0.080	Continuing	Continuing	Continuing
Test Equipment	WR	AVTB : MCTSSA Camp Pendleton	0.315	0.000	Oct 2016	0.071	Oct 2017	0.025	Oct 2018	-		0.025	0.000	0.411	-
		Subtotal	1.663	0.085		0.221		0.105		-		0.105	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
Data Management	C/FFP	MCTSSA Camp Pendleton : Camp Pendleton	1.618	0.000	Oct 2017	0.193	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
Lab and Tech Writer Supt.	C/FFP	MCTSSA Camp Pendleton : Camp Pendleton	0.423	0.449	Jun 2017	0.449	Dec 2017	0.371	Nov 2018	-		0.371	0.000	1.692	-
		Subtotal	2.041	0.449		0.642		0.371		-		0.371	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	9.188	1.135		2.861		2.297		-		2.297	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2237 / *Amphibious Vehicle Test*

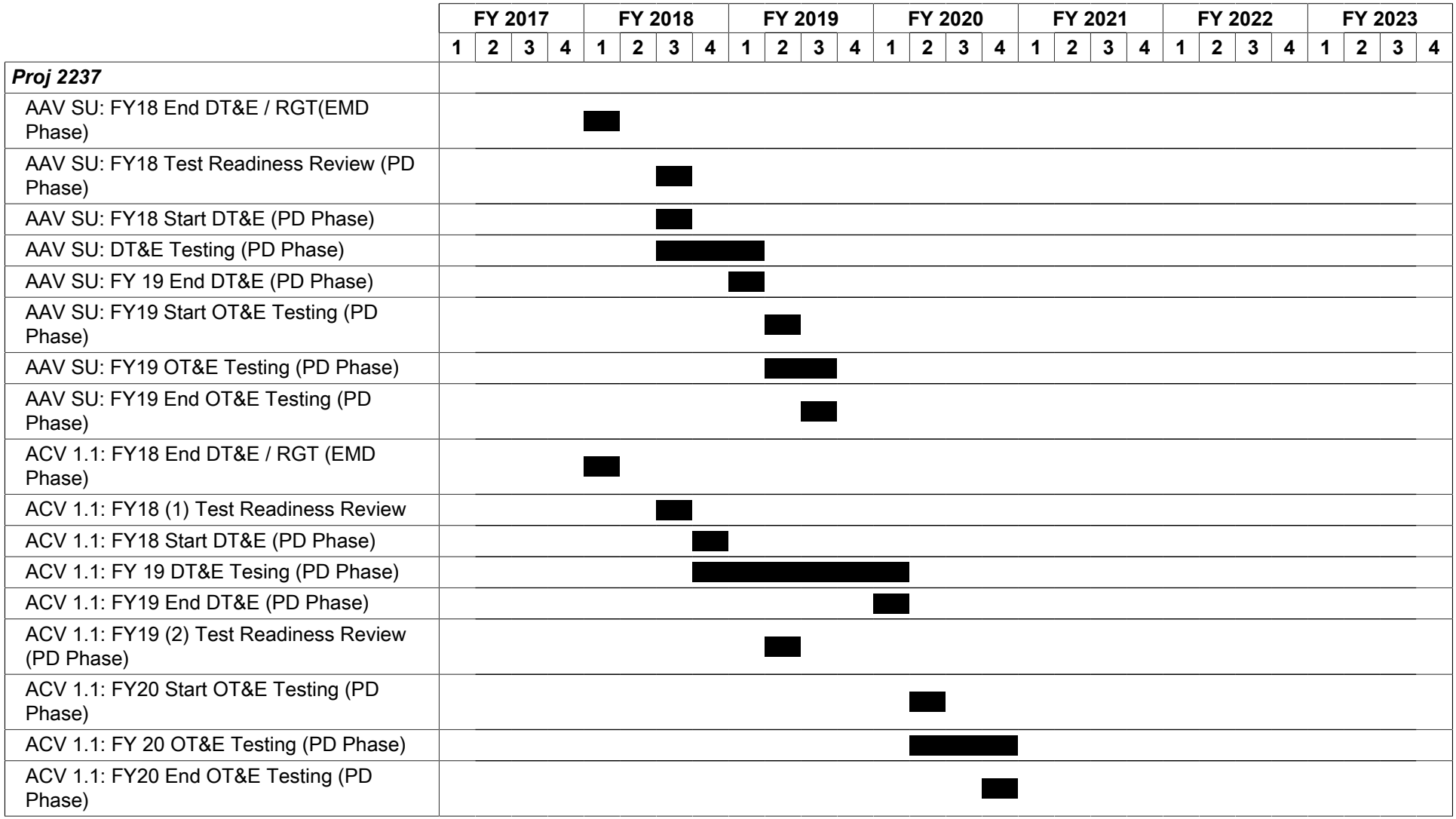


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2237 / *Amphibious Vehicle Test*

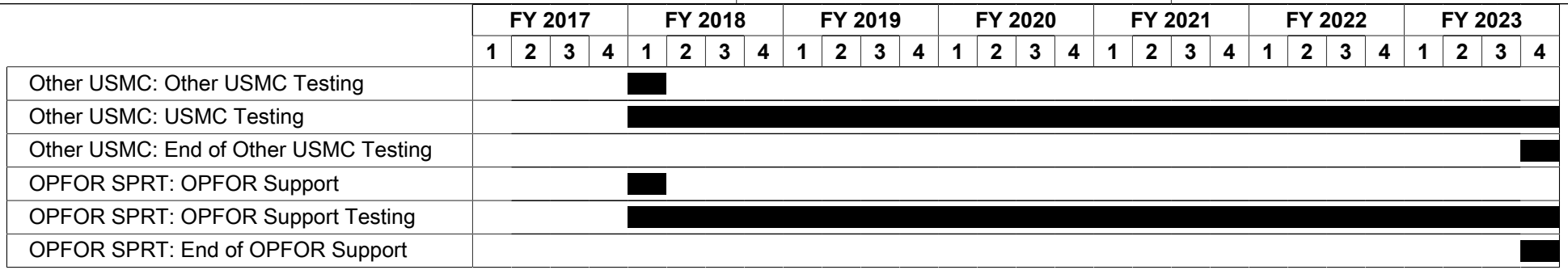


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2237 / *Amphibious Vehicle Test*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2237				
AAV SU: FY18 End DT&E / RGT(EMD Phase)	1	2018	1	2018
AAV SU: FY18 Test Readiness Review (PD Phase)	3	2018	3	2018
AAV SU: FY18 Start DT&E (PD Phase)	3	2018	3	2018
AAV SU: DT&E Testing (PD Phase)	3	2018	1	2019
AAV SU: FY 19 End DT&E (PD Phase)	1	2019	1	2019
AAV SU: FY19 Start OT&E Testing (PD Phase)	2	2019	2	2019
AAV SU: FY19 OT&E Testing (PD Phase)	2	2019	3	2019
AAV SU: FY19 End OT&E Testing (PD Phase)	3	2019	3	2019
ACV 1.1: FY18 End DT&E / RGT (EMD Phase)	1	2018	1	2018
ACV 1.1: FY18 (1) Test Readiness Review	3	2018	3	2018
ACV 1.1: FY18 Start DT&E (PD Phase)	4	2018	4	2018
ACV 1.1: FY 19 DT&E Tesing (PD Phase)	4	2018	1	2020
ACV 1.1: FY19 End DT&E (PD Phase)	1	2020	1	2020
ACV 1.1: FY19 (2) Test Readiness Review (PD Phase)	2	2019	2	2019
ACV 1.1: FY20 Start OT&E Testing (PD Phase)	2	2020	2	2020
ACV 1.1: FY 20 OT&E Testing (PD Phase)	2	2020	4	2020
ACV 1.1: FY20 End OT&E Testing (PD Phase)	4	2020	4	2020
Other USMC: Other USMC Testing	1	2018	1	2018
Other USMC: USMC Testing	1	2018	4	2023
Other USMC: End of Other USMC Testing	4	2023	4	2023
OPFOR SPRT: OPFOR Support	1	2018	1	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2237 / *Amphibious Vehicle Test*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
OPFOR SPRT: OPFOR Support Testing	1	2018	4	2023
OPFOR SPRT: End of OPFOR Support	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2315 / *Training Devices/Simulators*	

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
2315: *Training Devices/ Simulators*	129.886	15.942	23.927	18.328	-	18.328	18.061	22.215	19.279	19.674	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

(U) Training simulators supported by this program element include Combined Arms Command & Control Training Upgrade System (CACCTUS), Deployable Virtual Training Environment (DVTE), Force on Force Training Systems (FoFTS), Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements, Ranges and Training Area Management (RTAM) [Formerly Range Modernization/Transformation], Supporting Arms Virtual Trainer (SAVT), Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)], Tactical Decision Kits and Training Support. These training systems provide tactical weapons and decision-making skill training from entry level through MAGTF staff level. Systems will be interoperable and will allow for mission planning, mission rehearsal and concept evaluation in a valid synthetic environment with objective and timely feedback. Through live, virtual and constructive simulation, the Marine Corps will have the means to train jointly, educate, develop doctrine and tactics, formulate and assess operational plans, assess warfighting situations, and define 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: Combined Arms Command and Control Trainer Upgrade System (CACCTUS)	1.335	5.719	3.021	0.000	3.021
Articles:	-	-	-	-	-
Description: CACCTUS is a combined arms staff training system that when fully fielded will enable comprehensive Marine Corps staff, unit, and team training both at home station Combined Arms Staff Training (CAST) facilities and through Distributed training involving CAST facilities across the Marine Corps. CACCTUS is an upgrade to the USMC's CAST that provides fire support training for the Marine Air Ground Task Force (MAGTF) elements up to and including Marine Expeditionary Brigade (MEB) level. Using the system components and simulation capabilities, two dimensional (2D)and three dimensional (3D) visuals, interfaced Command, Control, Communications, Computers and Intelligence (C4I),synthetic terrain, and an After Action Review (AAR), the concept of operations for the CACCTUS system is to immerse the trainees in a realistic, scenario-driven environment to enable commands and their battle staffs to train or rehearse combined arms tactics, techniques and procedures for decision-making processes.					
FY 2018 Plans: - Continue integration of new 3D viewer software. - Continue additional training system interoperability to include new C4i devices. - Continue development of After Action Review (AAR) functionality.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue transition to new system communication environment. - Continue development of new architecture to support maturing hardware platforms. - Complete development of Distributed Ops. ***FY 2019 Base Plans:*** - Continue integration of 3D viewer software. - Continue additional training system interoperability to include additional C4i devices. - Continue development of After Action Review (AAR) functionality. - Initiate development to retain currency of training and readiness tasks and tactics, techniques and procedures with combined arms efforts. - Complete transition to a new communications environment. - Complete development of new architecture to support maturing hardware platforms. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $2.698M decrease from FY18 to FY19 is due to the completion of the transition to a new communications environment and completion of development to new architecture to support maturing hardware platforms.					
Title: Force on Force Training Systems (FoFTS) ***Articles:*** ***Description:*** FoFTS provides realistic, non-live-fire capabilities to perform force-on-force training and supports realistic, live-fire force-on-target training. The program develops, fields, and supports for a suite of tactical engagement systems that allow Marines to receive feedback in non-live fire FOF training by using low velocity projectiles or advanced, instrumented, laser-based tactical engagement systems. ***FY 2018 Plans:*** - Initiate the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) integration for LAV-25, LAV-AT and M1A1 simulators. - Initiate Augmented Immersive Team Trainer (AITT) Joint Tactical Air Controller (JTAC) task enhancements. ***FY 2019 Base Plans:*** - Continue the Combat Vehicle-Tactical Engagement Simulation System (CV-TESS) integration for LAV-25, LAV-AT and M1A1 simulators.	0.000 -	1.914 -	6.450 -	0.000 -	6.450 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue Augmented Immersive Team Trainer (AITT) Joint Tactical Air Controller (JTAC) task enhancements. - The increase of $4.8M in FY19 will provide additional capabilities to test out the expanded Long Term Evolution (LTE) wireless data communication network for Range 220 (29 Palms, CA) large scale exercises with communications back haul. - Development of the close combat instrumentation for the I-TESS III training system with a limited user evolution of new technologies to meet the urban training requirements for within 10 m range engagements. This will support the integration of the Mobile Fire Support Trainer (MFST) into the I-TESS III environment developing technology to allow for freedom of movement throughout the training area. These three areas of development will support the future objectives for I-TESS III by expanding the training radius, allowing for close combat effective training and augmented reality throughout the training area. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $4.536M from FY18 to FY19 will be used to finish development of Instrumented - Tactical Engagement Simulations Systems (I-TESS) III that enhances battlefield experiences at home station and developed venues.					
Title: Deployable Virtual Training Environment (DVTE)	0.000	2.369	2.408	0.000	2.408
Articles:	-	-	-	-	-
Description: DVTE is a laptop Personal Computer (PC) based simulation system capable of emulating organic and supporting Infantry Battalion weapons systems and training scenarios to facilitate training and readiness based training. Its portable configuration allows Marines to train in areas where there are few options for training in garrison, aboard ship, at remote reserve locations, and deployed. DVTE training includes language and culture training, platoon and squad level tactics, employment of supporting arms, and various Recognition of Combatants (ROC) packages. DVTE is part of a Commander's "training toolkit" contributing to the building block approach to standards based training focusing on achieving an improved level of combat readiness. ***FY 2018 Plans:*** - Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan. - Continue the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Support (CAS) capability and Combined Arms Planning Enhancements (CAPE) to replace/decrease actual live training events. - Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release. - Continue to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release. - Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release. - Initiate and complete Enhancements to Combined Arms Planning functionality that will improve the DVTE system ability to replace live events. ***FY 2019 Base Plans:*** - Continue incremental DVTE network infrastructure development by focusing on capabilities identified as DVTE application enhancements in the development plan. - Continue the additional efforts specified under the DVTE Software Capability Development Document (CDD) Increment II for Virtual Battlespace (VBS) release that includes improved Call For Fire (CFF) and Close Air Support (CAS) capability and Combined Arms Planning Enhancements (CAPE) to replace/decrease actual live training events. - Continue development of Tactical Air Control Party Green Gear modeling and Digital Fire Control System (DFCS) modeling for the Virtual Battlespace (VBS) release. - Continue to improve Flight Dynamics of Close Air Support (CAS) weapon platforms to more accurately represent live Joint Terminal Attack Controller (JTAC) training for the Virtual Battlespace (VBS) release. - Continue enhancement and integration of Comm Gear and After Action Review (AAR) for the Virtual Battlespace (VBS) release. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $0.039 increase from FY18 to FY19 is due to software development schedule.					
Title: Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) Enhancements	2.473	7.757	2.995	0.000	2.995
Articles:	-	-	-	-	-
Description: The MAGTF Tactical Warfare Simulation (MTWS) is the Marine Corps' only constructive, aggregate-level simulation system used to support the training of Marine commanders and their battle staffs					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
in MAGTF war-fighting principles/concepts and associated command and control procedures. Using complex computer-simulated behavior models, MTWS provides an interactive, decision-based, real-time, war game representing the six war-fighting functional areas of fires, command and control, force protection, logistics, maneuver, and intelligence. It's modeling breadth and flexibility enables users to represent and exercise a wide variety of combat scenarios to prepare leaders to face the military challenges of today's world. MTWS is designed to support the training of commanders and their staffs in exercises involving live and simulated land, air, and naval forces at all operational command levels. The system supports all levels of command throughout the Marine Expeditionary Force (MEF) and Joint Task Force (JTF). MTWS can be used as a multi-sided war game, including red, blue, civilian, and non-aligned sides. The system can also be used to validate specific operational plans against a variety of enemy and environmental situations. Thus command personnel may examine alternative tactical solutions on a "what if" basis. ***FY 2018 Plans:*** - Continue interoperability development of MTWS integration into Joint Live Virtual and Constructive (JLVC) Federation. - Continue development to increase levels of software capability to meet the changing operational environment that Marines fight in daily. - Continue Live, Virtual and Constructive (LVC) simulation integration. - Initiate contractual efforts to re-engineer the MTWS software baseline. ***FY 2019 Base Plans:*** - Continue interoperability development of MTWS integration into Joint Live Virtual and Constructive (JLVC) Federation. - Continue development to increase levels of software capability to meet the changing operational environment that Marines fight in daily. - Continue Live, Virtual and Constructive (LVC) simulation integration. - Continue contractual efforts to re-engineer the MTWS software baseline. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $4.762M decrease from FY18 to FY19 is due to software refresh schedule.					
Title: Ranges and Training Area Management (RTAM)	0.753	1.101	1.068	0.000	1.068

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

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: Ranges and Training Area Management (RTAM) developments are associated with modernizing live training ranges at major USMC bases and stations. This development effort enhances After Action Review (AAR) with ground truth feedback, realistic representation of Opposing Forces (OPFOR), and will upgrade the range and exercise control capabilities. RTAM integrates Live, Virtual, and Constructive training technologies, thereby, enhancing fielded live-fire, force-on-target, and force-on-force training capabilities. ***FY 2018 Plans:*** - Continue to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems. - Continue enhancements of TRACR software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon) - Continue enhancements of the Tactical Video Capture System (TVCS) Mobile (RISCon) ***FY 2019 Base Plans:*** - Continue to perform minimum software upgrades to add capability to the Range Instrumentation Systems Exercise Controller (RISCon) through the integration of numerous live/target systems. - Continue enhancements of TRACR software for Friend-and-Foe target control and scenario development, to include integration with Range Instrumentation System Controller (RISCon) - Continue enhancements of the Tactical Video Capture System (TVCS) Mobile (RISCon) ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $0.033M decrease from FY 18 to FY 19 will result in minimum software upgrades and enhancements associated with the Range Instrumentation System Controller (RISCon)					
Title: Supporting Arms Virtual Trainer (SAVT)	0.000	2.203	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The SAVT will advance the training capability, operational readiness, and tactical proficiency of USMC Joint					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Terminal Attack Controllers (JTACS), Forward Observers (FOs), and Forward Air Controllers (FACs). The personnel will use training scenarios that require the placement of tactical ordnance on selected targets using Joint Close Air Support (JCAS) procedures and observed fire procedures for Naval Surface Fire Support (NSFS),artillery and mortar fire to perform destruction, neutralization, suppression, illumination/coordinated illumination, interdiction and harassment fire missions. ***FY 2018 Plans:*** - Initiate and complete development and integration of Battlefield effects and aircraft behaviors software. - Initiate and complete information Assurance and networkability in order to interoperate with other Simulations in Live Virtual Constructive (LVC). - Initiate and complete enhancements of command features and flight models. - Initiate and complete development and integration of Fixed and Rotary Wing flight profiles. - Initiate and complete post engineer support and developmental installation and operational testing. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease of $2.203 down to $0.00 from FY 18 to FY 19 is due to scheduled completion of the development, enhancements and integration in FY 18 for SAVT.					
Title: Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)]	3.506	2.829	2.386	0.000	2.386
Articles:	-	-	-	-	-
Description: The Immersive Training Range Support (ITRS) [formerly Squad Immersive Training Environment (SITE)] is an integrating construct or "toolkit" of Live, Virtual and Constructive (LVC) training capabilities used to significantly improve infantry squad operational readiness and squad leader tactical decision-making skills. The collection of LVC training capabilities within SITE will enhance opportunities for squad collective training to increase tactical proficiency, confidence, and readiness for real world operations. SITE will enhance skill transfer and assessment by enabling squads to finish, test, and remediate training in preparation for a capstone exercise such as pre-deployment training.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

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 produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability. - Complete the integration of the AITT within the OneTESS Mortar capability and produce the prototype items for testing. - Initiate virtual integration tasks for Combat Convoy Simulator (CCS), SAVT, DVTE gateways and database commonality. ***FY 2019 Base Plans:*** - Continue to produce additional documentation associated with product development to include (1) Systems Design Specification; (2) Interface Design Document; and (3) an overarching System Engineering Master Plan (SEMP) crossing current training systems to steer development of standards and a roadmap for system capability upgrades and sustained interoperability. - Continue virtual integration tasks for CCS, SAVT, DVTE gateways and database commonality. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $.443M decrease from FY18 to FY19 will result in the removal of of the virtual integration tasks for CCS.					
Title: Training Support	0.675	0.035	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Provide training solution development efforts for the modernization of training systems by providing high fidelity, immersive simulations and capabilities. Integrates existing live, virtual, and constructive training capabilities to provide fully coordinated Marine Air Ground Training Force (MAGTF) training exercises that realistically simulate the operating environment. ***FY 2018 Plans:*** - Continue interoperability development of MAGTF Tactical Warfare Simulation (MTWS) integration to Joint Live, Virtual and Constructive (JLVC) Federation, with primary focus on amphibious landings.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue Live, Virtual and Constructive (LVC) simulation integration. ***FY 2019 Base Plans:*** Decrease from FY18 to FY19 is due to technical correction to Program Objective Memorandum (POM) 19 to permanently realign funding to MTWS for software development. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of .035M from FY18 to FY19 is due to technical correction to Program Objective Memorandum (POM) 19 to permanently realign funding to MTWS for software development.					
Title: Tactical Decision Kits (TDK) ***Articles:*** ***Description:*** The Tactical Decision Kit (TDK) is a small unit decision-making capability toolkit. Components can be applied in unison or stand-alone. Kits consist of laptop computers with specific software to create virtual "decision rooms" which enhance force on force training. TDK also includes augmented reality which superimposes a computer-generated image in the headsets and network storage for map data. Map data is gathered by small, hobby shop quality, remote control helicopters with cameras (Phantom 4 Pro Plus). TDK allows Marines the ability to conduct live and virtual tactical decision games, develop graphic-based orders, mission plan in augmented reality, and subsequently brief, execute and debrief live missions. ***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 FY 2018 to FY 2019.	7.200 -	0.000 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	15.942	23.927	18.328	0.000	18.328

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

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/6532-01: *Training Devices, CACCTUS*	3.515	4.659	2.909	-	2.909	4.590	4.467	4.148	4.231	Continuing	Continuing
• PMC/6532-02: *Training Devices, RTAM*	14.766	19.481	22.476	-	22.476	17.838	37.835	29.156	31.541	Continuing	Continuing
• PMC/6532-03: *Training Devices, SAVT*	1.419	4.212	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.631
• PMC/6532-04: *Training Devices, DVTE*	2.229	2.538	0.947	-	0.947	1.776	4.276	4.158	4.241	Continuing	Continuing
• PMC/6532-05: *Training Devices, Force on Force Training Systems*	0.000	7.456	20.942	-	20.942	67.187	56.888	54.463	9.652	Continuing	Continuing
• PMC/6532-06: *Training Devices, Immersive Training Range Support/SITE*	0.000	25.012	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.012
• PMC/6532-07: *Training Devices, MTWS*	0.000	0.904	0.752	-	0.752	0.765	0.779	0.795	0.811	Continuing	Continuing

Remarks

D. Acquisition Strategy

(U) CACCTUS - MIPRs to Army and exercise task orders on competitive contract (C/IDIQ).
(U) DVTE - Exercise task orders off of new sole source IDIQ for Virtual Battleship Space (VBS) Software (SW) Development.
(U) MTWS - Exercise task orders off of IDIQ contract awarded December 2016, period of performance is January 2017 - December 2017.
(U) RTAM - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract.
(U) SAVT - New competitive (C/FFP) contract supporting the Joint Terminal Attack Controller (JTAC) Memorandum of Agreement (MOA) awarding Base contract in December 2017 and awarding task order to support this effort in Mar 2018.
(U) IMMERSIVE TRAINING RANGE SUPPORT (formerly SITE) - MIPR to the Army-PEO STRI planned for award on existing Consolidated Product-line Management Contract; and exercise option on existing MCSC RDTE contract M67854-13-C-7802 (C/FFP).
(U) Training Support - Extended existing contract 9 months in order to continue activities in support of federate status with the Joint Live Virtual Constructive (JLVC) federation v.8, and complete in-process enhancements for Ulchi Freedom Guardian-15 (UFG-15); Exercise task order on new competitive contract (C/IDIQ).
(U) FoFTS - MIPR to Army-PEO STRI for award on existing Consolidated Product-line Management contract; New competitive I-TESS-III award planned for March 2019
(U) Tactical Decision Kits - awarded prime contract to Tuva, LLC, Herndon, VA.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

E. Performance Metrics

Program Management Reviews are conducted on all PM TRASYS programs on a quarterly basis to assess program status.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2315 / *Training Devices/Simulators*	

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
CACCTUS - SW Dev TO 7	C/IDIQ	Riptide Software, Inc : Oviedo, FL	0.000	0.000		2.771	Nov 2018	0.000		-		0.000	0.000	2.771	-
CACCTUS - SW Dev TO 1	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	5.048	0.000		0.165	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
CACCTUS - SW Dev TO 2	C/IDDQ	Riptide Software, Inc. : Orlando, FL	1.118	0.000		1.647	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
CACCTUS - SW Dev TO 3	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.554	0.000		0.986	Jul 2018	0.000		-		0.000	Continuing	Continuing	Continuing
CACCTUS - SW Dev TO 4	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.000	0.596	Apr 2017	0.000		1.700	May 2019	-		1.700	0.000	2.296	-
CACCTUS - SW Dev TO 5	C/IDIQ	Riptide Software, Inc. : Oviedo, FL	0.000	0.739	Nov 2017	0.000		1.221	Jan 2019	-		1.221	0.000	1.960	-
CACCTUS - SW Dev TO 6	C/IDIQ	Riptide Software, Inc. : Orlando, FL	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
DVTE - SW Dev - VBS	SS/IDIQ	Bohemia Interactive : Orlando, FL	13.813	0.000	Jun 2017	2.369	Jan 2018	2.408	Dec 2018	-		2.408	Continuing	Continuing	Continuing
Tactical Decision Kit	C/FFP	Tuva : Herndon, VA	0.000	7.200	Mar 2017	0.000		0.000		-		0.000	0.000	7.200	-
MTWS - SW Dev Task 2	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	2.294	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MTWS - SW Dev Task 3	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.150	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MTWS - SW Dev Task 4	C/IDDQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
MTWS - SW Dev Task 5	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.097	Dec 2016	0.000		0.000		-		0.000	0.000	0.097	-
MTWS - SW Dev Task 6	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.948	Mar 2017	0.000		0.000		-		0.000	0.000	0.948	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2315 / *Training Devices/Simulators*	

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
MTWS - SW Dev Task 7	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	1.341	0.876	Mar 2017	0.000		0.000		-		0.000	0.000	2.217	-
MTWS - SW Dev Task 8	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.000	0.552	Nov 2017	0.000		0.000		-		0.000	0.000	0.552	-
MTWS - Reengineering	C/IDIQ	RECOMPETE : TBD NEW VENDOR	0.000	0.000		4.257	Jun 2018	2.995	Jan 2019	-		2.995	0.000	7.252	-
MTWS - SWDev Task 9	C/IDIQ	Cole Engineering, Inc. : Orlando, FL	0.000	0.000		2.399	Dec 2017	0.000		-		0.000	0.000	2.399	-
MTWS - SWDev Task 10	C/IDIQ	Cole Engineering, Inc. : Orlando, FL	0.000	0.000		0.169	Dec 2017	0.000		-		0.000	0.000	0.169	-
MTWS - SWDev Task 11	C/IDIQ	Cole Engineering, Inc. : Orlando, FL	0.000	0.000		0.932	Dec 2017	0.000		-		0.000	0.000	0.932	-
RTAM RISCon Development	MIPR	PEOSTRI/TRADE : Orlando, FL	7.606	0.753	Mar 2017	1.101	Dec 2017	1.068	Dec 2018	-		1.068	Continuing	Continuing	Continuing
SAVT - SW Dev	C/FFP	TBD : TBD	0.000	0.000		2.203	Mar 2018	0.000		-		0.000	0.000	2.203	-
ITRS (SITE) - Live Core System Upgrades	C/FFP	Cubic Defense : San Diego, CA	3.563	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
ITRS (SITE) - Consolidated Product Line Dev	MIPR	PEOSTRI/TRADE : Orlando, FL	2.120	3.454	Mar 2017	2.829	Dec 2017	2.386	Dec 2018	-		2.386	Continuing	Continuing	Continuing
Training Support - MTWS - SW Dev Task 2	C/IDIQ	Cole Engineering Services Inc. : Orlando, FL	0.294	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Training Support - LVE-TE AoA	FFRDC	NAVSEA : Washington, DC	0.000	0.675	Sep 2017	0.035	Feb 2018	0.000		-		0.000	0.000	0.710	-
FoFTS SW Development	MIPR	PEOSTRI/TRADE : Orlando, FL	0.000	0.000		1.914	Dec 2017	2.500	Oct 2018	-		2.500	0.000	4.414	-
FoFTS SW Development CV-TESS	MIPR	PEOSTRI/TRADE : Orlando, FL	0.000	0.000		0.000		3.950	Oct 2018	-		3.950	0.000	3.950	-
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	71.995	0.000		0.000		0.000		-		0.000	0.000	71.995	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2315 / *Training Devices/Simulators*	

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
		Subtotal	109.896	15.890		23.777		18.228		-		18.228	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
CACCTUS - Engineering Support	MIPR	RDECOM : Orlando, FL	2.982	0.000		0.150	Oct 2017	0.100	Dec 2018	-		0.100	Continuing	Continuing	Continuing
RTAM - SW Dev Support	WR	NAWCTSD : Orlando, FL	1.166	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
ITRS (SITE) - Travel	Various	DTS : Various	0.043	0.052	Mar 2017	0.000		0.000		-		0.000	0.000	0.095	-
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	15.797	0.000		0.000		0.000		-		0.000	0.000	15.797	-
		Subtotal	19.988	0.052		0.150		0.100		-		0.100	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

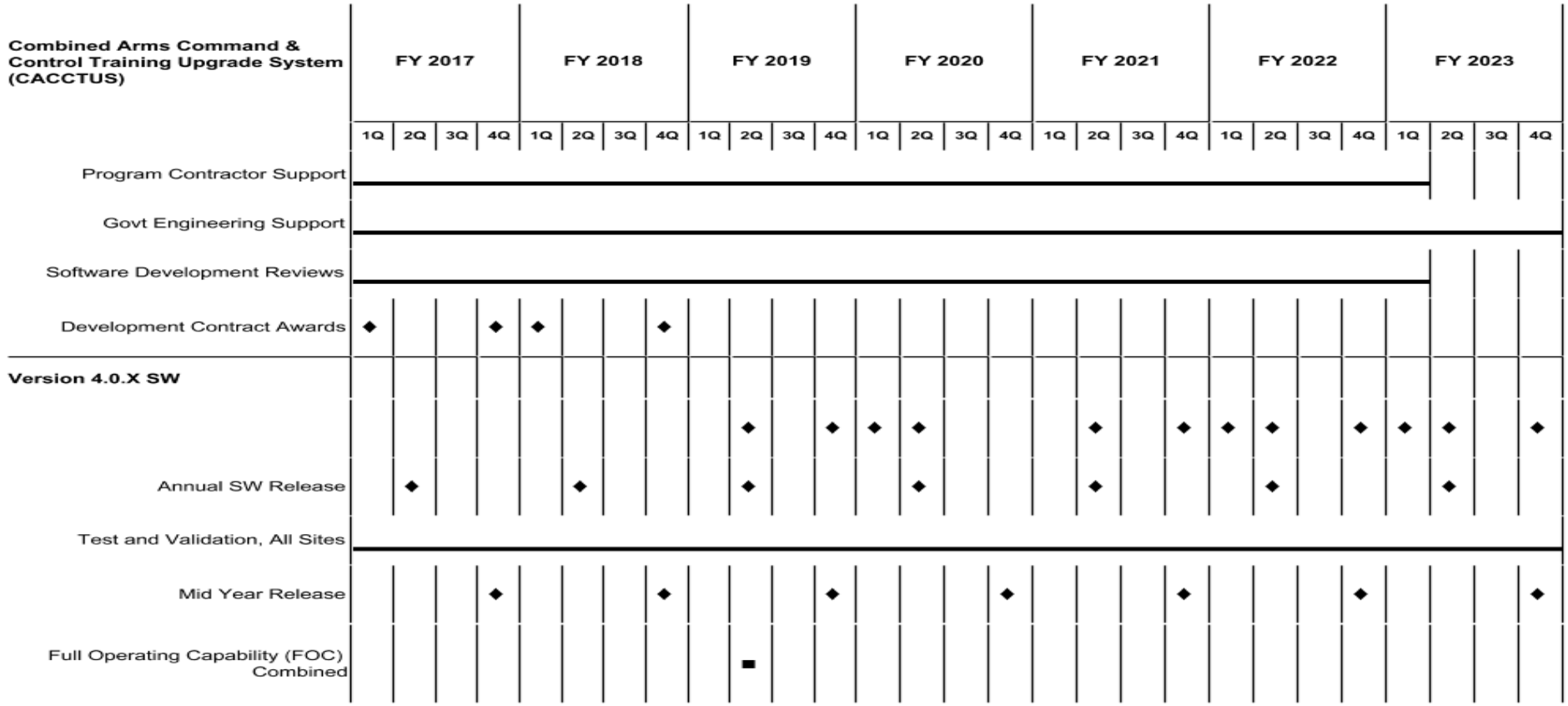
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Cumulative Funding	Various	Not Specified : Not Specified	0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	-
		Subtotal	0.002	0.000		0.000		0.000		-		0.000	0.000	0.002	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	129.886	15.942		23.927		18.328		-		18.328	Continuing	Continuing	N/A

Remarks

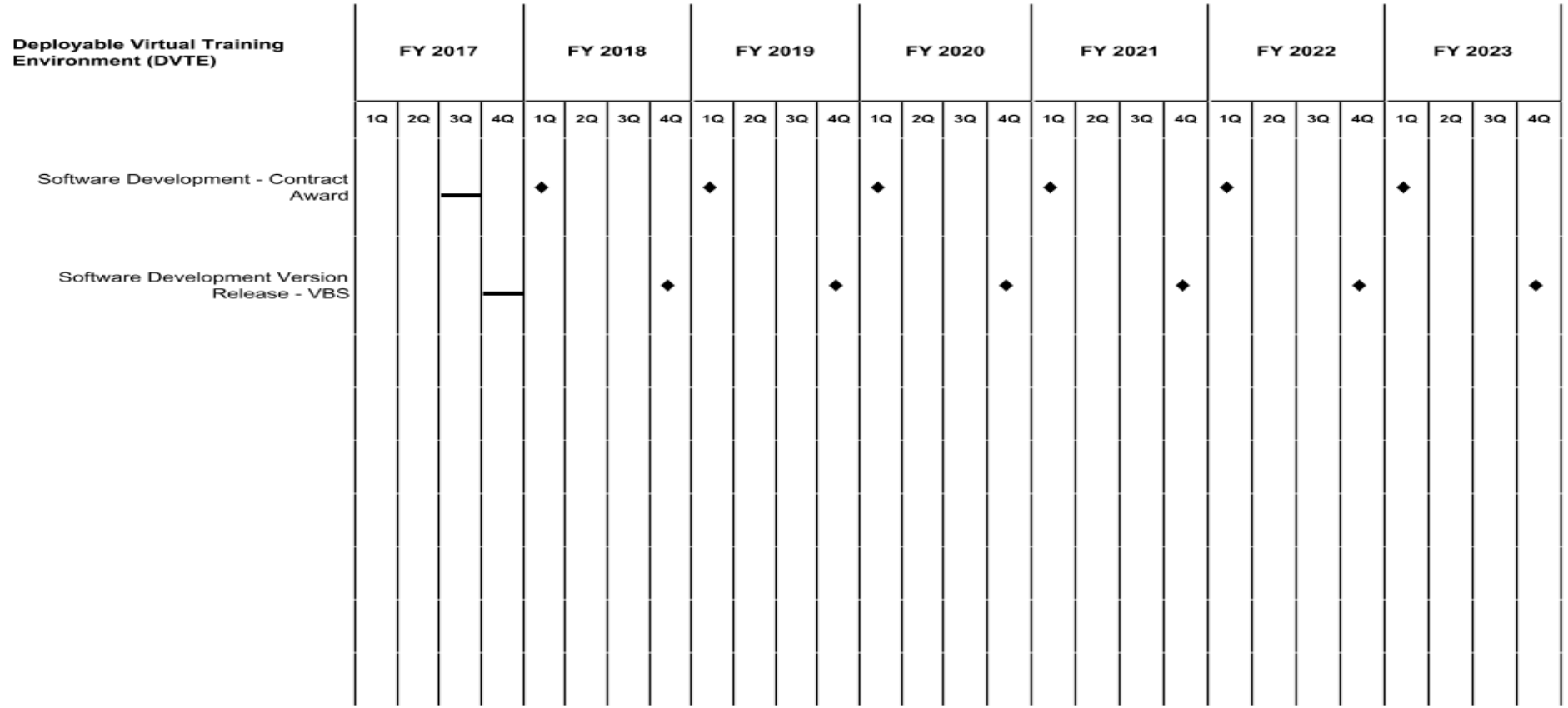
Decrease from FY18 to FY19 reflects programs moving through their acquisition lifecycle.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



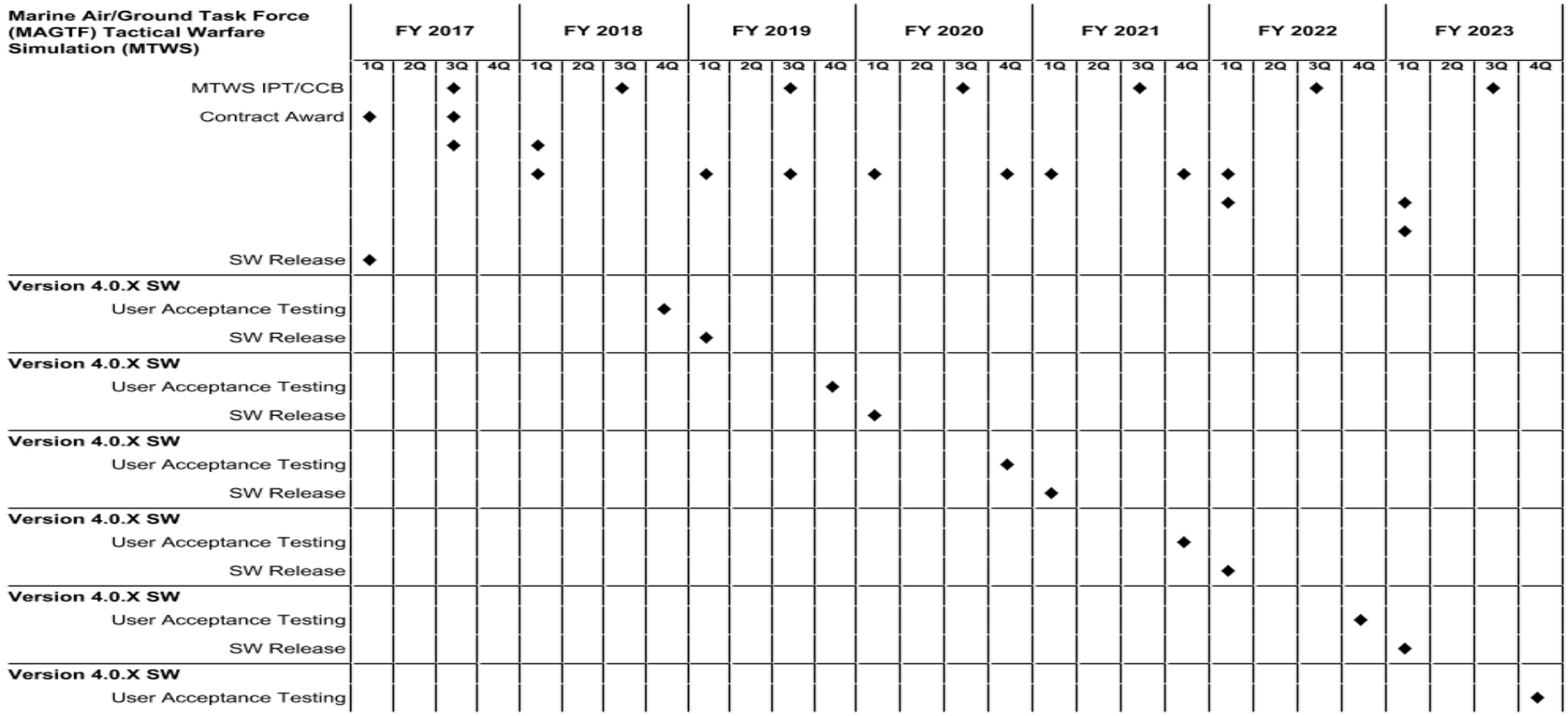
2019DON - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



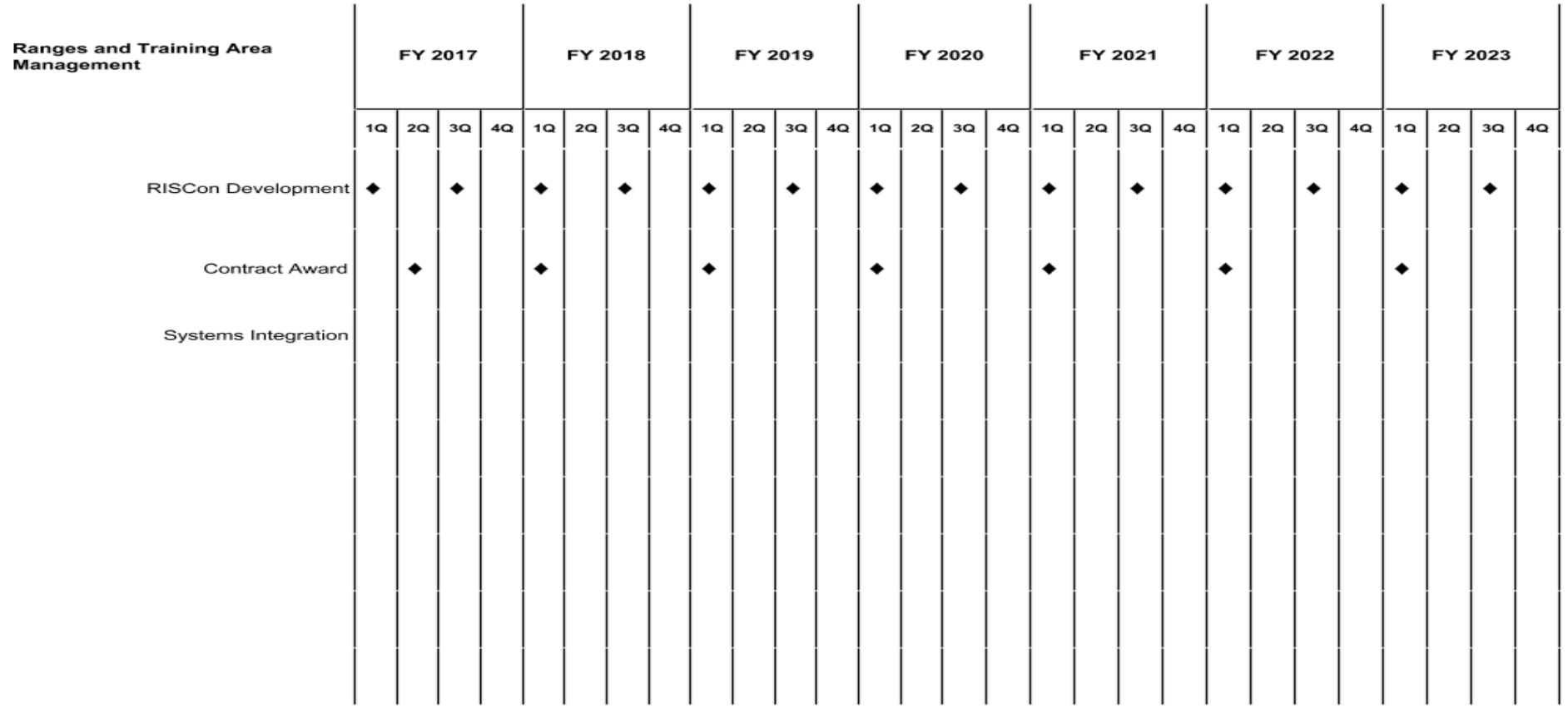
2019DON - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



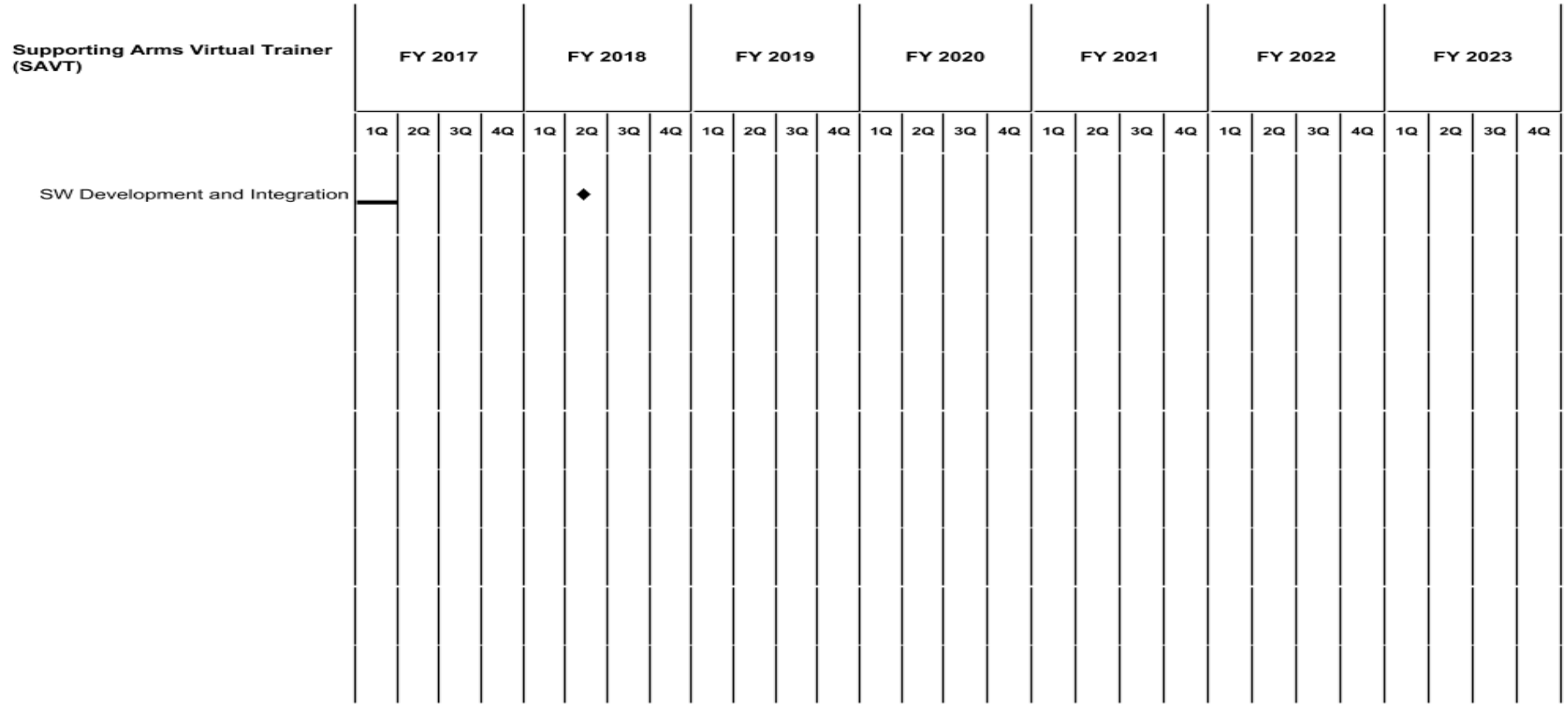
2019DON - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



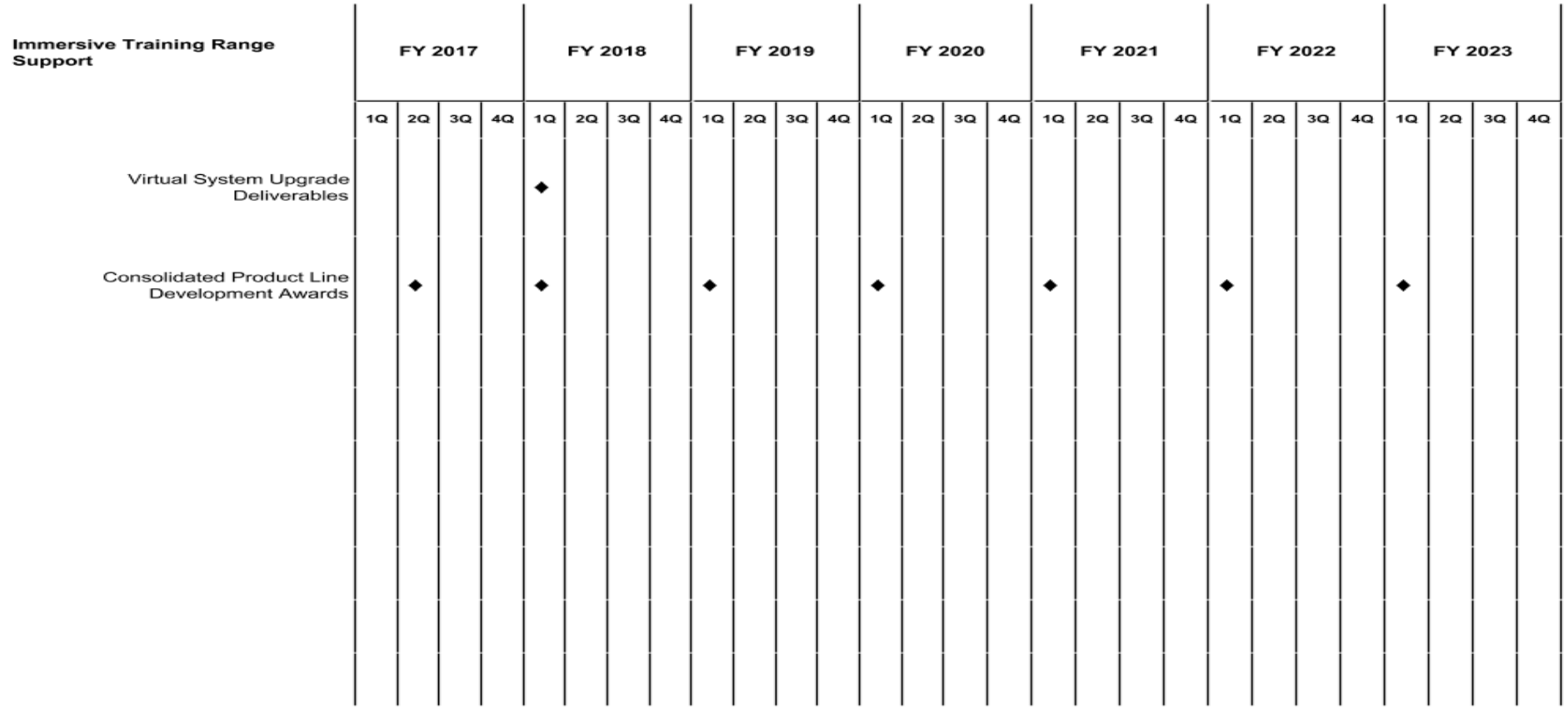
2019DON - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



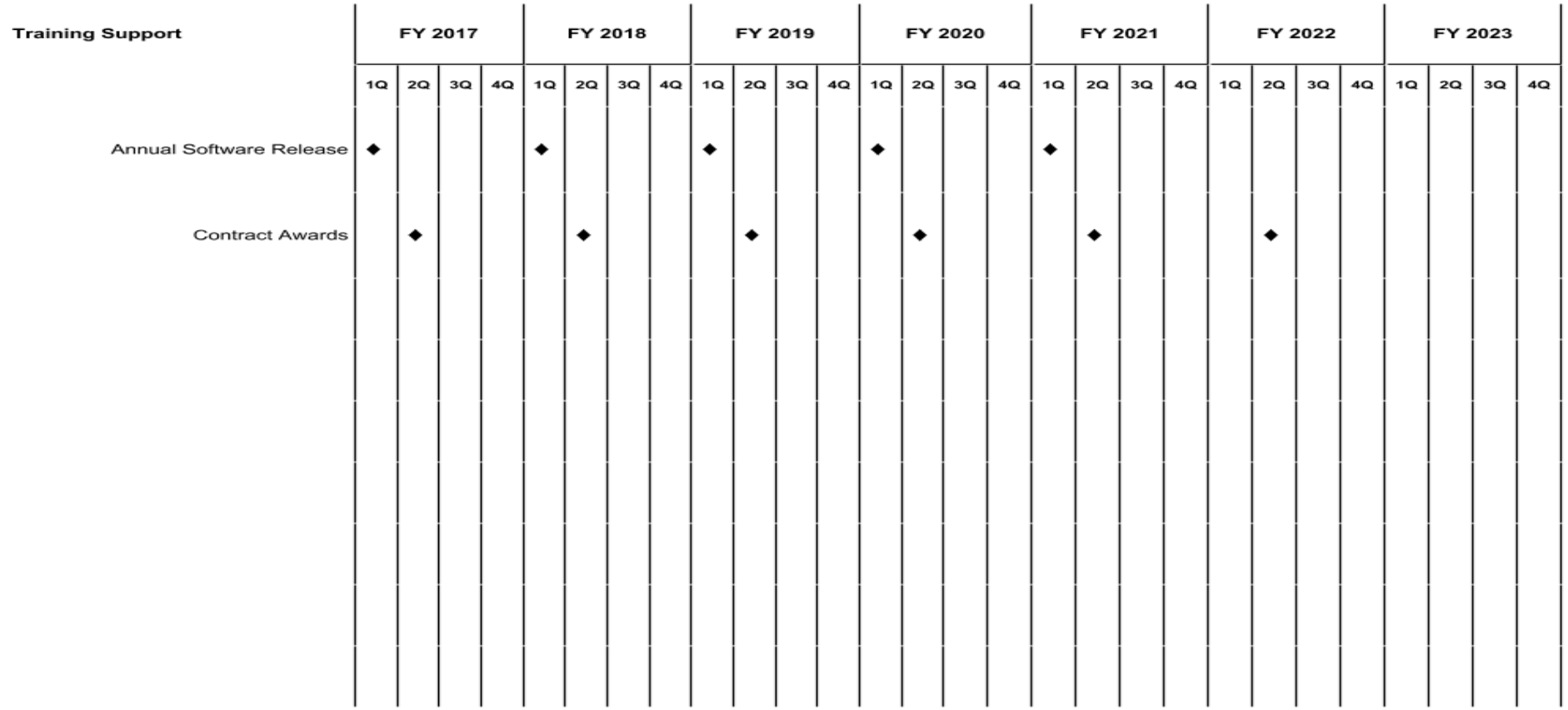
2019DON - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



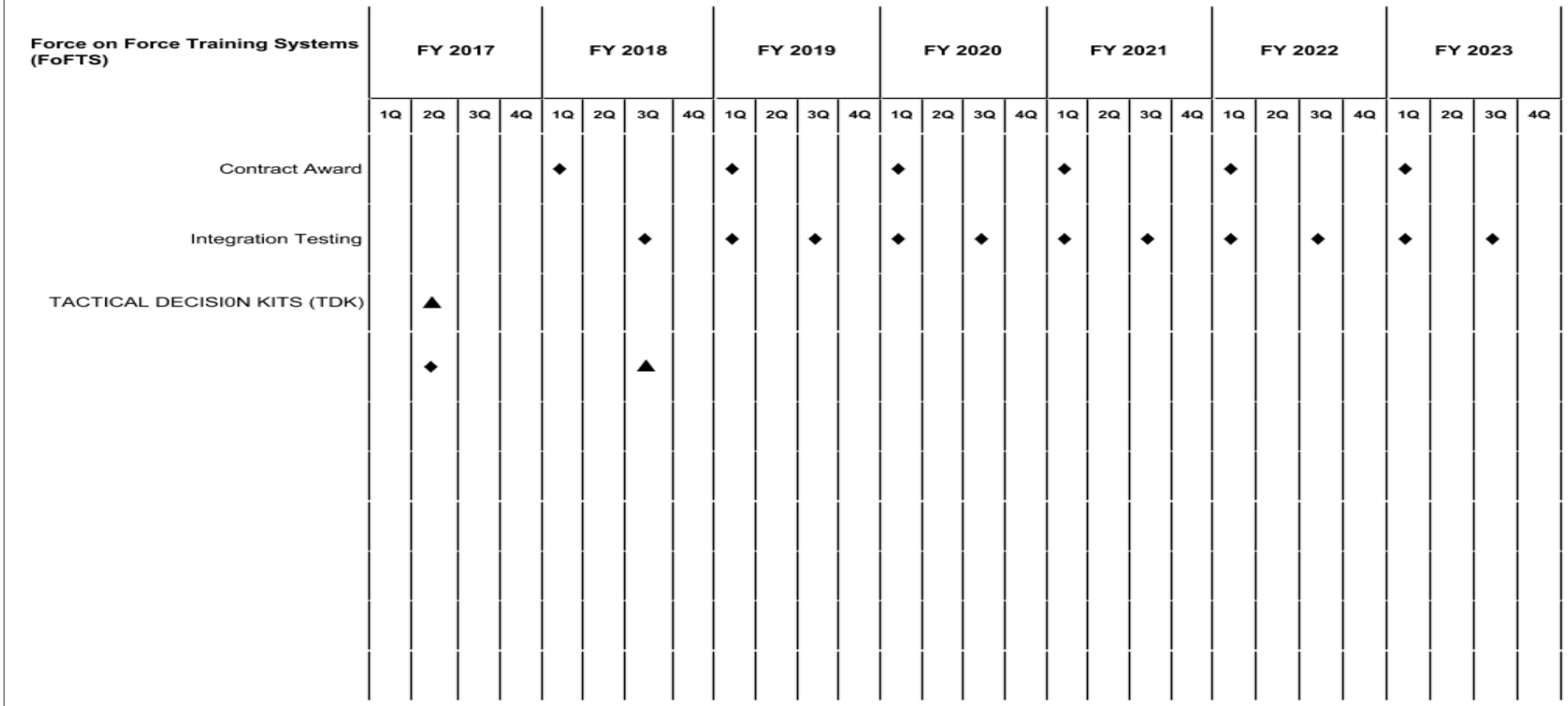
2019DON - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



2019DON - 0206623M - 2315

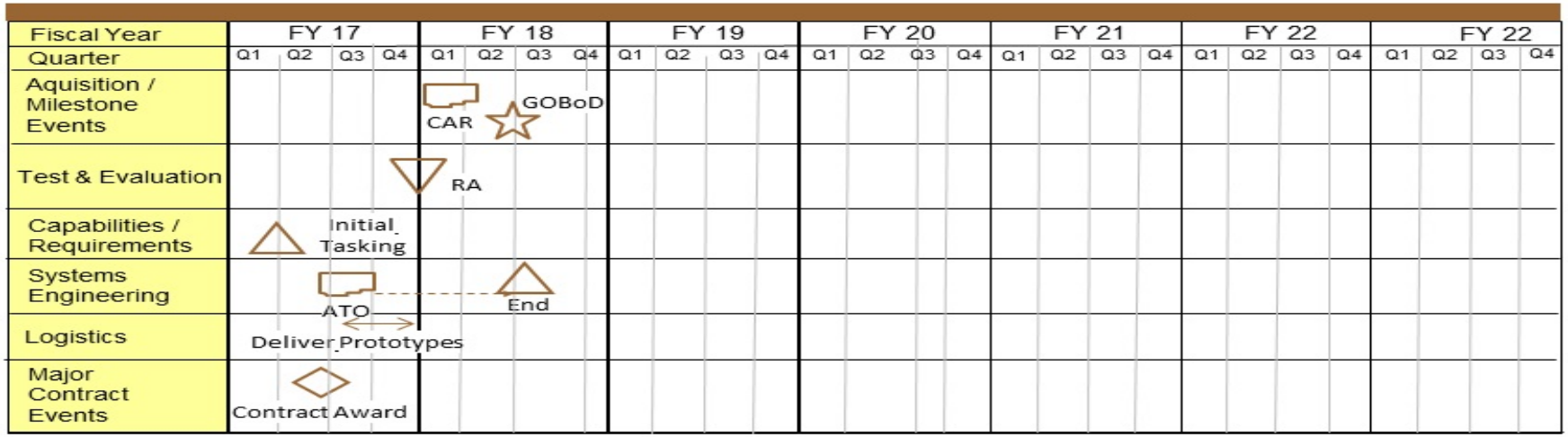
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*



2019DON - 0206623M - 2315

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

TACTICAL DECISI0N KITS (TDK) PROGRAM SCHEDULE



1

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Combined Arms Command & Control Training Upgrade System (CACCTUS)				
Program Contractor Support: Program Contractor Support	1	2017	1	2023
Govt Engineering Support: Govt Engineering Support	1	2017	4	2023
Software Development Reviews: Software Development Reviews	1	2017	1	2023
Development Contract Awards: FY17 Award 1	1	2017	1	2017
Development Contract Awards: FY17 Award 2 & 3	4	2017	4	2017
Development Contract Awards: FY18 Award 1, 2 & 3	1	2018	1	2018
Development Contract Awards: FY18 Award 4	4	2018	4	2018
Version 4.0.X SW: FY19 Award 1	2	2019	2	2019
Version 4.0.X SW: FY19 Award 2	4	2019	4	2019
Version 4.0.X SW: FY20 Award 1	1	2020	1	2020
Version 4.0.X SW: FY20 Award 2	2	2020	2	2020
Version 4.0.X SW: FY21 Award 1	2	2021	2	2021
Version 4.0.X SW: FY21 Award 2	4	2021	4	2021
Version 4.0.X SW: FY22 Award 1	1	2022	1	2022
Version 4.0.X SW: FY22 Award 2	2	2022	2	2022
Version 4.0.X SW: FY22 Award 3	4	2022	4	2022
Version 4.0.X SW: FY23 Award 1	1	2023	1	2023
Version 4.0.X SW: FY23 Award 2	2	2023	2	2023
Version 4.0.X SW: FY23 Award 3	4	2023	4	2023
Version 4.0.X SW: Annual SW Release: Annual SW Release 2017	2	2017	2	2017
Version 4.0.X SW: Annual SW Release: Annual SW Release 2018	2	2018	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Version 4.0.X SW: Annual SW Release: Annual SW Release 2019	2	2019	2	2019
Version 4.0.X SW: Annual SW Release: Annual SW Release 2020	2	2020	2	2020
Version 4.0.X SW: Annual SW Release: Annual SW Release 2021	2	2021	2	2021
Version 4.0.X SW: Annual SW Release: Annual SW Release 2022	2	2022	2	2022
Version 4.0.X SW: Annual SW Release: Annual SW Release 2023	2	2023	2	2023
Version 4.0.X SW: Test and Validation, All Sites: Test and Validation 1, All Sites 2017	1	2017	4	2023
Version 4.0.X SW: Mid Year Release: Mid Year Release 2017	4	2017	4	2017
Version 4.0.X SW: Mid Year Release: Mid Year Release 2018	4	2018	4	2018
Version 4.0.X SW: Mid Year Release: Mid Year Release 2019	4	2019	4	2019
Version 4.0.X SW: Mid Year Release: Mid Year Release 2020	4	2020	4	2020
Version 4.0.X SW: Mid Year Release: Mid Year Release 2021	4	2021	4	2021
Version 4.0.X SW: Mid Year Release: Mid Year Release 2022	4	2022	4	2022
Version 4.0.X SW: Mid Year Release: Mid Year Release 2023	4	2023	4	2023
Version 4.0.X SW: Full Operating Capability (FOC) Combined: Full Operating Capability (FOC)/Full Development (FD)	2	2019	2	2019
Deployable Virtual Training Environment (DVTE)				
Software Development - Contract Award: Software Development - Contract Award 2017	3	2017	3	2017
Software Development - Contract Award: Software Development - Contract Award 2018	2	2018	2	2018
Software Development - Contract Award: Software Development - Contract Award 2019	1	2019	1	2019
Software Development - Contract Award: Software Development - Contract Award 2020	1	2020	1	2020
Software Development - Contract Award: Software Development - Contract Award 2021	1	2021	1	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Software Development - Contract Award: Software Development - Contract Award 2022	1	2022	1	2022
Software Development - Contract Award: Software Development - Contract Award 2023	1	2023	1	2023
Software Development Version Release - VBS: Software Development Version Release - VBS (2017)	4	2017	4	2017
Software Development Version Release - VBS: Software Development Version Release - VBS (2018)	4	2018	4	2018
Software Development Version Release - VBS: Software Development Version Release - VBS (2019)	4	2019	4	2019
Software Development Version Release - VBS: Software Development Version Release - VBS (2020)	4	2020	4	2020
Software Development Version Release - VBS: Software Development Version Release - VBS (2021)	4	2021	4	2021
Software Development Version Release - VBS: Software Development Version Release - VBS (2022)	4	2022	4	2022
Software Development Version Release - VBS: Software Development Version Release - VBS (2023)	4	2023	4	2023
Marine Air/Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS)				
MTWS IPT/CCB: MTWS IPT/CCB 2017	3	2017	3	2017
MTWS IPT/CCB: MTWS IPT/CCB 2018	3	2018	3	2018
MTWS IPT/CCB: MTWS IPT/CCB 2019	3	2019	3	2019
MTWS IPT/CCB: MTWS IPT/CCB 2020	3	2020	3	2020
MTWS IPT/CCB: MTWS IPT/CCB 2021	3	2021	3	2021
MTWS IPT/CCB: MTWS IPT/CCB 2022	3	2022	3	2022
MTWS IPT/CCB: MTWS IPT/CCB 2023	3	2023	3	2023
Contract Award: Contract Award New Development	1	2017	1	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Contract Award: TO 7 Award	3	2017	3	2017
Contract Award: TO 8 Award	3	2017	3	2017
Contract Award: Contract Award Reengineering	1	2018	1	2018
Contract Award: TO 1 Award	1	2018	1	2018
Contract Award: Contract Opt 1 Reengineering	1	2019	1	2019
Contract Award: TO 2 Award	3	2019	3	2019
Contract Award: Contract Opt 2 Reengineering	1	2020	1	2020
Contract Award: TO 3 Award	4	2020	4	2020
Contract Award: Contract Opt 3 Reengineering	1	2021	1	2021
Contract Award: TO 4 Award	4	2021	4	2021
Contract Award: Contract Opt 4 Reengineering	1	2022	1	2022
Contract Award: TO 5 Award	1	2022	1	2022
Contract Award: Contract Opt 5 Reengineering	1	2023	1	2023
Contract Award: TO 6 Award	1	2023	1	2023
SW Release: SW Release 2017	1	2017	1	2017
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2018	4	2018	4	2018
Version 4.0.X SW: SW Release: SW Release 2019	1	2019	1	2019
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2019	4	2019	4	2019
Version 4.0.X SW: SW Release: SW Release 2020	1	2020	1	2020
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2020	4	2020	4	2020
Version 4.0.X SW: SW Release: SW Release 2021	1	2021	1	2021
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2021	4	2021	4	2021
Version 4.0.X SW: SW Release: SW Release 2022	1	2022	1	2022
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2022	4	2022	4	2022
Version 4.0.X SW: SW Release: SW Release 2023	1	2023	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Version 4.0.X SW: User Acceptance Testing: User Acceptance Testing 2023	4	2023	4	2023
Ranges and Training Area Management				
RISCon Development: RISCon SW Integration Testing 1st Qtr FY17	1	2017	1	2017
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY17	3	2017	3	2017
RISCon Development: RISCon SW Integration Testing 1st Qtr FY18	1	2018	1	2018
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY18	3	2018	3	2018
RISCon Development: RISCon SW Integration Testing 1st Qtr FY19	1	2019	1	2019
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY19	3	2019	3	2019
RISCon Development: RISCon SW Integration Testing 1st Qtr FY20	1	2020	1	2020
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY20	3	2020	3	2020
RISCon Development: RISCon SW Integration Testing 1st Qtr FY21	1	2021	1	2021
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY21	3	2021	3	2021
RISCon Development: RISCon SW Integration Testing 1st Qtr FY22	1	2022	1	2022
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY22	3	2022	3	2022
RISCon Development: RISCon SW Integration Testing 1st Qtr FY23	1	2023	1	2023
RISCon Development: RISCon SW Integration Testing 3rd Qtr FY23	3	2023	3	2023
Contract Award: Contract Award (2017)	2	2017	2	2017
Contract Award: Contract Award (2018)	1	2018	1	2018
Contract Award: Contract Award (2019)	1	2019	1	2019
Contract Award: Contract Award (2020)	1	2020	1	2020
Contract Award: Contract Award (2021)	1	2021	1	2021
Contract Award: Contract Award (2022)	1	2022	1	2022
Contract Award: Contract Award (2023)	1	2023	1	2023
Systems Integration: Systems Integration	1	2023	4	2023
Supporting Arms Virtual Trainer (SAVT)				

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SW Development and Integration: FY18 Task Order Award	2	2018	2	2018
SW Development and Integration: Govt Engineering Support	1	2017	1	2017
Immersive Training Range Support				
Virtual System Upgrade Deliverables: Virtual System Upgrade Deliverables	1	2018	1	2018
Consolidated Product Line Development Awards: Consolidated Product Line Development (2017)	2	2017	2	2017
Consolidated Product Line Development Awards: Consolidated Product Line Development (2018)	1	2018	1	2018
Consolidated Product Line Development Awards: Consolidated Product Line Development (2019)	1	2019	1	2019
Consolidated Product Line Development Awards: Consolidated Product Line Development (2020)	1	2020	1	2020
Consolidated Product Line Development Awards: Consolidated Product Line Development (2021)	1	2021	1	2021
Consolidated Product Line Development Awards: Consolidated Product Line Development (2022)	1	2022	1	2022
Consolidated Product Line Development Awards: Consolidated Product Line Development (2023)	1	2023	1	2023
Training Support				
Annual Software Release: MTWS SW Dev TO 7	1	2017	1	2017
Annual Software Release: MTWS SW Dev TO 1	1	2018	1	2018
Contract Awards: FY17 Award	2	2017	2	2017
Contract Awards: FY18 Award	2	2018	2	2018
Contract Awards: FY19 Award	2	2019	2	2019
Contract Awards: FY20 Award	2	2020	2	2020
Contract Awards: FY21 Award	2	2021	2	2021
Contract Awards: FY22 Award	2	2022	2	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2315 / *Training Devices/Simulators*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Force on Force Training Systems (FoFTS)				
Contract Award: FY18 Award	1	2018	1	2018
Contract Award: FY19 Award	1	2019	1	2019
Contract Award: FY20 Award	1	2020	1	2020
Contract Award: FY21 Award	1	2021	1	2021
Contract Award: FY22 Award	1	2022	1	2022
Contract Award: FY23 Award	1	2023	1	2023
Contract Award: I-TESS III Award	3	2019	3	2019
Integration Testing: Integration Testing 3rd Qtr FY18	3	2018	3	2018
Integration Testing: Integration Testing 1st Qtr FY19	1	2019	1	2019
Integration Testing: Integration Testing 3rd Qtr FY19	3	2019	3	2019
Integration Testing: Integration Testing 1st Qtr FY20	1	2020	1	2020
Integration Testing: Integration Testing 3rd Qtr FY20	3	2020	3	2020
Integration Testing: Integration Testing 1st Qtr FY21	1	2021	1	2021
Integration Testing: Integration Testing 3rd Qtr FY21	3	2021	3	2021
Integration Testing: Integration Testing 1st Qtr FY22	1	2022	1	2022
Integration Testing: Integration Testing 3rd Qtr FY22	3	2022	3	2022
Integration Testing: Integration Testing 1st Qtr FY23	1	2023	1	2023
Integration Testing: Integration Testing 3rd Qtr FY23	3	2023	3	2023
TACTICAL DECISI0N KITS (TDK): Intial Tasking	2	2017	2	2017
TACTICAL DECISI0N KITS (TDK): Contract Award, Tuva LLC, Herndon, VA	2	2017	2	2017
TACTICAL DECISI0N KITS (TDK): Authority to Operate (ATO) ends	3	2018	3	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2503 / *Initial Issue*	

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
2503: *Initial Issue*	46.258	3.275	4.656	5.412	-	5.412	5.480	5.764	5.852	5.948	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Load Bearing and Pack Systems now includes the Waterproof bag efforts previously included under Individual Warfighting Equipment.

A. Mission Description and Budget Item Justification

This funding provides research, development, test and evaluation on low cost items with an emphasis on Non-Developmental Items/Commercial-Off-the-Shelf (NDI/COTS) available items. Much of the RDT&E is conducted in coordination/concert with other services and joint organizations, and in consideration of RDT&E efforts being pursued by the other Services. Items approved for procurement will transition into Operation and Maintenance Marine Corps accounts for Infantry Combat Equipment, Family of Shelters, and Combat Field Feeding Systems; Family of Field Medical Equipment. Beginning in FY19 for the Family of Field Medical Equipment, items approved for procurement will also transition to the Procurement, Marine Corps account. The benefits will be reduced logistics, less weight, improved combat effectiveness, better echelon I and II care for Marines, improved individual and unit protection, expeditionary feeding platforms, tactical mobility, calibration and maintenance, etc. The employment of state of the art equipment will ensure Marines are equipped and supported with the best items that technology can offer.

The Infantry Combat Equipment portfolio of capabilities encompasses Marine Corps Uniforms, Cold Weather and Mountaineering, Load Bearing and Pack Systems, and Individual Warfighting Equipment research, development and testing of enhancements, upgrades and modifications to legacy systems and new developments. Funding for this capability area leverages other Services' and governmental partners' efforts to maximize returns on investment and promote coordination and cooperation for same or similar requirements and capabilities. The objective is to equip individual Marines with uniforms and combat equipment to maximize effectiveness in every environment across the full range of military operations.

The Family of Field Medical Equipment (FFME) focus is to provide state of the art medical equipment and emerging medical technology that will improve the clinical outcomes for casualties. The focus is also to replace obsolete items with those that fulfill the requirements and needs while increasing performance characteristics in the areas of energy efficiency, durability, reliability, weight, size and survivability in austere environments of a variety of climes.

The Family of Shelters and Shelters Equipment (FSSE) and The Family of Combat Field Feeding Systems (CFFS) portfolio focus is to provide high-quality and scalable expeditionary capabilities to the warfighter. The Family of Shelters provides the materiel solutions required to protect the Operating Forces from observation, adverse climatic environments, and combat hazards. The Family of Combat Field Feeding provides food preparation and service equipment to sustain Marines on-the-move and in a static position. The next generation of equipment seeks to use alternate energy sources and new materials.

The Calibration and Maintenance Program (CAMP) provides a calibration and maintenance capability supporting the calibrated tools and test equipment used by over 40,000 Marine maintainers and technicians. Calibration of tools as simple as torque wrenches to as complex as satellite test equipment is required to ensure their safe operation.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Marine Corps Uniforms (MCU)	0.533	0.590	0.964	0.000	0.964
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG). Efforts include RDT&E on a Flame Resistant utility uniform which will be lifesaving and used for training. - Continue testing and evaluation of emerging Marine Corps Uniform Board (MCUB) and Commandant of the Marine Corps (CMC) uniform initiatives. - Continue research and development of tropical uniforms, including footwear, and develop affordable alternatives. - Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development. - Continue to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices. - Continue research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items. - Continue research on reducing the load the Marines are required to transport by minimizing equipment.					
FY 2019 Base Plans: - Continue research, development, testing and evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG). Efforts include RDT&E on lower cost, more durable, and comfortable Flame Resistant utility uniforms which will be lifesaving and used for training. Testing will require larger scale lab and field testing. - Continue research and development of tropical uniforms, including footwear, and develop affordable alternatives. Testing will require larger scale lab and field testing. - Continue testing and evaluation of emerging Marine Corps Uniform Board (MCUB) and Commandant of the Marine Corps (CMC) uniform initiatives. - Continue clothing and fabric improvement efforts leveraging advanced technologies in uniform durability, design, and footwear development. - Continue to support Marine clothing efforts, to include field and dress uniforms and certification of their associated accoutrements which includes badges, ribbons and devices. - Continue research, development and testing to enhance appearance and service life of Seabag issue, which consists of initial basic training clothing, footwear, and associated individual uniform items.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue research on reducing the load the Marines are required to transport by minimizing equipment. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in funding of ($0.374M)for Research, Development, Testing and Evaluation (RDT&E) to increase effectiveness of Flame Resistant Organizational Gear (FROG).					
Title: Cold Weather and Mountaineering (CWM)	0.793	1.782	1.575	0.000	1.575
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine. - Continue validation of ski systems and all components to include boots and clothing. - Continue the comparative analysis of sister services clothing items to minimize sustainment cost. - Continue modernization of existing suite of equipment to incorporate technology advances which will drive the development of the Marine Assault Climbers Kit (MACK) to effectively and safely negotiate horizontal and vertical obstacles. - Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) evaluation to assess change proposals. - Continue evaluation of Extreme Cold Weather boots and Intense Cold Weather boots.					
FY 2019 Base Plans: - Continue to conduct research and development of industry technology to further enhance existing equipment effectiveness while lightening the load of the individual Marine. - Continue validation of ski systems and all components to include boots and clothing in order to procure NATO ski system to full AAO. - Continue the comparative analysis of sister services clothing items to minimize sustainment cost. - Continue modernization of existing suite of equipment to incorporate technology advances which will drive the development of the Marine Assault Climbers Kit (MACK) to effectively and safely negotiate horizontal and vertical obstacles. - Continue Marine Corps Cold Weather Infantry Kit (MCCWIK) evaluation to assess change proposals. - Continue evaluation of Extreme Cold Weather boots and Intense Cold Weather boot.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

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 in funding of ($0.207M) from FY2018 to FY2019 aligns with completion of Test & Evaluation Plan for NATO Ski's.					
Title: Load Bearing and Pack Systems (LBPS)	0.232	0.310	0.298	0.000	0.298
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to explore potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry; lighten load and increase mobility of effectiveness. - Continue evaluations to implement minor product improvements to existing USMC systems. ***FY 2019 Base Plans:*** - Continue to explore potential avenues for product improvements and upgrades for LBPS by leveraging technological advancements of industry; lighten load and increase mobility of effectiveness. - Continue evaluations to implement minor product improvements to existing USMC systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Budget decrease from FY18 to FY19 of ($0.012M) is in line with requirements and resource realignment of all commodity areas and budget adjustments made by the Marine Corps.					
Title: Individual Warfighting Equipment (IWE)	0.208	0.195	0.112	0.000	0.112
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA). - Continue modernization of existing projects by leveraging the technological advances of industry. ***FY 2019 Base Plans:*** - Continue cataloging for future sustainment of Mechanical Breachers Kit (MBK) through Defense Logistics Agency (DLA).					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue modernization of existing projects by leveraging the technological advances of industry. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in funding of ($0.083M) from FY2018 to FY2019 aligns with reduced level of effort to modernize over 100 individual pieces of equipment within the Individual Warfighting Equipment portfolio.					
Title: *Family of Field Medical Equipment (FFME)	0.886	1.245	1.001	0.000	1.001
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to test COTS/NDI medical equipment items for the ERCS, FRSS and STP to determine future viability in an operation environment. - Continue testing of medical equipment items to evaluate their energy efficiency, functionality and ability to improve the quality of healthcare provided to the warfighter and reduce the logistics footprint of USMC medical equipment. - Continue testing and product development for possible application technology for insertion. - Initiate additional collaborative testing with Army for patient movement research. - Continue collaborative testing efforts with Army for ACCS. - Continue collaborative testing efforts with Army for TBI non-invasive diagnosis and treatment to determine viability in a operational environment in support of reduction of TBI effects. ***FY 2019 Base Plans:*** - Continue to test COTS/NDI medical equipment items for the ERCS, FRSS and STP to determine future viability in an operation environment. - Continue testing of medical equipment items to evaluate their energy efficiency, functionality and ability to improve the quality of healthcare provided to the warfighter and reduce the logistics footprint of USMC medical equipment. - Continue testing and product development for possible application technology for insertion. - Continue collaborative testing with Army for patient movement research. - Continue collaborative testing efforts with Army for ACCS.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue collaborative testing efforts with Army for Traumatic Brain Injury (TBI) non-invasive diagnosis and treatment to determine viability in a operational environment in support of reduction of TBI effects. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in funding of $0.244M from FY18 to FY19 aligns with the test and evaluation plan for COTS/NDI medical equipment for AMAL Modernization Insertion.					
Title: *Family of Shelters and Shelter Equipment (FSSE) ***Articles:*** ***FY 2018 Plans:*** - Continue development of energy efficient ECPs for FSSE. - Continue development of the SSH (formerly identified as the Next Generation Heater) for soft wall shelters. ***FY 2019 Base Plans:*** - Initiate testing of Phase II Small Business Innovative Research (SBIR) for an improved insulation barrier system (Tent Liner). - Continue development of energy efficient ECPs for FSSE. - Complete the development of the Test SSH (formally Next Generation Heater) Phase II prototype for soft wall shelters. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in funding of $0.113M from FY18 to FY19 aligns with the Single Source Heater development shift from Phase I to Phase II.	0.523 -	0.475 -	0.362 -	0.000 -	0.362 -
Title: Calibration and Maintenance Program (CAMP) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:***	0.000 -	0.000 -	0.250 -	0.000 -	0.250 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Initiate exploration of emerging technologies to enhance the technical capabilities and to reduce size and weight of the expeditionary calibration facilities used by deployed Marine Corps units. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $250K increase from FY18 to FY19 supports CAMP exploration of emerging technologies to enhance technical capabilities of expeditionary calibration facilities.					
Title: *Family of Combat Field Feeding (CFFS) ***Articles:*** ***FY 2018 Plans:*** - Continue testing of technological improvements for use in CFFS that will reduce the overall logistics burden. - Continue testing of Phase II SBIR for alternate energy sources for Combat Field Feeding heating rations. ***FY 2019 Base Plans:*** - Continue testing of technological improvements for use in CFFS that will reduce the overall logistics burden. - Continue testing for Phase II SBIR Prototype for Alternate Energy Sources for Heating Rations. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in funding of $0.009M from FY18 to FY19 aligns with testing schedule for alternate energy sources and technological improvements.	0.100 -	0.059 -	0.050 -	0.000 -	0.050 -
Title: Family of Expeditionary Water Systems (FEWS) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** -Initiate market research for Grey Water Recycling research to support improvements to the Combat Batch Laundry (CBL) and Shower systems. ***FY 2019 OCO Plans:***	0.000 -	0.000 -	0.400 -	0.000 -	0.400 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

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 increases ($0.400M) from FY18 to FY19 incorporates first year RDTE funding requirement for Family of Expeditionary Water Systems and Family of Expeditionary Fuel Systems. Supports market research for squad water purification system in support of Expeditionary Force 21.					
Title: Family of Expeditionary Fuel Systems (FEFS) ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** -Initiate market research to determine fuel utilized by a MAGTF during operations to right size fuel system modular packages for proper distribution, storage and test capabilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increases ($0.400M) from FY18 to FY19 incorporates first year RDTE funding requirement for Family of Expeditionary Fuel Systems. Supports market research for and modernization of equipment allowing for the next phase of fuels dispensing, testing and metering equipment, respectively.	0.000 -	0.000 -	0.400 -	0.000 -	0.400 -
Accomplishments/Planned Programs Subtotals	3.275	4.656	5.412	0.000	5.412

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/652200: *Family of FIeld Medical Equipment*	0.000	0.000	33.513	-	33.513	3.109	4.405	10.382	10.723	Continuing	Continuing
• PMC/418100: *Calibration & Maintenance Program (CAMP).*	0.000	0.576	11.916	-	11.916	11.821	2.831	2.930	0.147	Continuing	Continuing
• PMC/6670: *Family of Expeditionary Water Systems (FEWS)*	1.220	2.011	4.263	-	4.263	5.050	5.201	3.490	3.490	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

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/627700: *Family of Expeditionary Fuel Systems (FEFS)*	0.000	1.788	0.054	-	0.054	0.052	0.051	0.051	0.050	Continuing	Continuing

Remarks

D. Acquisition Strategy

Cold Weather and Mountaineering, Load Bearing and Pack Systems, Individual Warfighting Equipment, Marine Corps Uniforms: Items utilize various acquisition strategies. These programs leverage heavily on current developments and technology in commercial industry. As a result, the government's R&D phase is relatively short. Contracting is performed by either Marine Corps Systems Command Contracting Directorate, the Naval Research Laboratory or the U.S. Army Natick Soldier Research, Development and Engineering Center via Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts. ID/IQ contracts are used to decrease the government risk, allow maximum contract flexibility and capitalize on the savings realized by utilizing Economic Order (EO) Quantities.

Family of Shelters: The Shelter acquisition strategy is to modify NDI to further meet the requirements of the Marine Corps, to support development of multi-service items through inter-service agreements and to adopt COTS items.

Family of Field Medical Equipment: These programs leverage heavily on current development and technology in the commercial medical industry. The field medical acquisition strategy is to modify NDI and adopt COTS items.

Combat Field Feeding Systems: This program utilized various acquisition strategies and leverages heavily on current developments and technology in commercial industry and other Service field feeding systems. As a result, the government's RDTE phase is relatively short. Contracting is performed by either Marine Corps Systems Command Contracting Directorate or the U.S. Army Natick Soldier Research, Development and Engineering Center (DoD Executive Agent for Field Feeding) via ID/IQ contracts. ID/IQ contracts are used to decrease the government risk, allow maximum contract flexibility and capitalize on the savings realized by utilizing EO Quantities.

Calibration and Maintenance Program (CAMP): The CAMP acquisition strategy is to evaluate NDI items and ask industry for enhancements and modifications to meet technical and expeditionary requirements. This will be in concert with Navy's calibration RDT&E efforts.

Family of Expeditionary Water Systems (FEWS) is a family of systems line that contains water bath, shower, and laundry systems and well as water purification, storage, distribution, and test systems. This capability is necessary to provide safe and potable water to Marines in expeditionary environments. The family contains individual Table of Allowance Material Control Numbers which supports MAGTF operations by providing all aspects of land-based water support to include analysis, receipt, storage, transfer and dispensing. Research and development supports upgrades to centrally management items, preplanned product improvements, and obsolescence mitigation via newer components and subsystems supported by industry. Research and development also supports ongoing market research and water studies to

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

ensure systems support current and future CONOPS and USMC O-Plans at the enterprise level. Current thrust areas are Grey Water Recycling and small unit water purification as well as upgrading/replacing legacy systems.

Family of Expeditionary Fuel Systems (FEFS) is a family of systems line that contains highly versatile fuel systems designed to receive, test, store, transfer and dispense fuel in support of Marine Air Ground Tactical Force (MAGTF) operations. The family contains individual Table of Allowance Material Control Numbers which supports MAGTF operations by providing all aspects of land-based fuel support to include analysis, receipt, storage, transfer and dispensing including all the components required to configure those systems. Research and development supports upgrades to centrally management items, preplanned product improvements, and obsolescence mitigation via newer components and subsystems supported by industry. Research and development also supports ongoing market research and fuel studies to ensure systems support current and future Fuel CONOPS and USMC O-Plans at the enterprise level. Current thrust areas are fuel system modularity and ship-to beachhead and beachhead to inland fuel distribution as well as upgrading/replacing legacy systems.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2503 / *Initial Issue*	

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
Calibration and Maintenance Program	MIPR	NSWC : Corona, CA	0.000	0.000		0.000		0.250	Jan 2019	-		0.250	Continuing	Continuing	Continuing
Family of Field Medical	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.200	May 2018	0.000		-		0.000	0.000	0.200	-
Family of Field Medical	MIPR	NSRDEC : Natick, MA	0.000	0.000		0.150	Apr 2018	0.000		-		0.000	0.000	0.150	-
Family of Shelters and Shelter Equipment	MIPR	NSRDEC : Natick, MA	0.000	0.000		0.026	Mar 2018	0.000		-		0.000	0.000	0.026	-
Family of Shelters and Shelter Equipment	MIPR	Natick : Natick, MA	0.000	0.000		0.026	Jan 2018	0.000		-		0.000	0.000	0.026	-
Cold Weather & Mountaineering	MIPR	USA NSRDEC : Natick, MA	0.000	0.299	Jan 2017	0.949	Apr 2018	0.814	Feb 2019	-		0.814	Continuing	Continuing	Continuing
Family of Shelters and Shelter Equipment	MIPR	USA NSRDEC : Natick, MA	0.783	0.301	Jan 2017	0.154	Apr 2018	0.202	Jan 2019	-		0.202	0.000	1.440	-
Load Bearing and Pack Systems	MIPR	AFRL : Wright Patterson AFB	0.403	0.232	Jan 2017	0.310	Feb 2018	0.298	Feb 2019	-		0.298	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	Natick : Natick, MA	0.398	0.834	Jan 2017	0.137	Nov 2017	0.000		-		0.000	0.000	1.369	-
Individual Warfighting Equipment	MIPR	USA NSRDEC : Natick, MA	0.449	0.121	May 2017	0.117	May 2018	0.112	Feb 2019	-		0.112	Continuing	Continuing	Continuing
Marine Corps Uniforms	MIPR	USA NSRDEC : Natick, MA	5.231	0.400	Jun 2017	0.354	Jan 2018	0.482	Feb 2019	-		0.482	Continuing	Continuing	Continuing
Prior Year Cumulative Funding	Various	Various : Various	21.760	0.000		0.000		0.000		-		0.000	0.000	21.760	-
		Subtotal	29.024	2.187		2.423		2.158		-		2.158	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 Year Cumulative Funding	Various	Various : Various	1.096	0.000		0.000		0.000		-		0.000	0.000	1.096	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2503 / *Initial Issue*	

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	1.096	0.000		0.000		0.000		-		0.000	0.000	1.096	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
Family of Shelters and Shelter Equipment	MIPR	TACOM : Natick, MA	0.000	0.176	Jul 2017	0.000		0.000		-		0.000	0.000	0.176	-
Family of Expeditionary Water Systems	MIPR	NAVFAC : Port Hueneme, CA	0.000	0.000		0.000		0.400	Mar 2019	-		0.400	0.000	0.400	-
Family of Expeditionary Fuel Systems	C/CPFF	Contracts : MCSC	0.000	0.000		0.000		0.400	Mar 2019	-		0.400	0.000	0.400	-
Marine Corps Uniform	MIPR	NCTRF : Natick, MA	0.223	0.067	Jan 2017	0.118	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	U.S. Army Aeromedical Research Lab : Ft. Rucker, AL	0.000	0.000		0.215	May 2018	0.501	Jun 2019	-		0.501	0.000	0.716	-
Family of Shelters and Shelter Equipment	MIPR	NSRDEC : Natick, MA	0.000	0.000		0.130	Apr 2018	0.000		-		0.000	0.000	0.130	-
Family of Combat Field Feeding	MIPR	USA NSRDEC : Natick, MA	0.634	0.100	Jan 2017	0.059	Jan 2018	0.050	Jan 2019	-		0.050	Continuing	Continuing	Continuing
Marine Corps Uniforms	MIPR	USA NSRDEC : Natick, MA	0.701	0.066	Jan 2017	0.118	Jan 2018	0.482	Feb 2019	-		0.482	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	USAARL : Ft. Rucker, AL	1.456	0.052	May 2017	0.430	Apr 2018	0.350	Jan 2019	-		0.350	Continuing	Continuing	Continuing
Family of Shelters & Shelter Equipment	MIPR	USA NSRDEC : Natick, MA	0.581	0.046	Aug 2017	0.120	Nov 2017	0.160	Jan 2019	-		0.160	0.000	0.907	-
Cold Weather and Mountaineering	MIPR	USA NSRDEC : Natick, MA	1.503	0.494	Jan 2017	0.833	Dec 2017	0.761	Feb 2019	-		0.761	Continuing	Continuing	Continuing
Family of Field Medical	MIPR	AFMESA : Ft. Detrick, MD	0.000	0.000		0.000		0.150	Jul 2019	-		0.150	0.000	0.150	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

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 Cumulative Funding	Various	Various : Various	10.286	0.000		0.000		0.000		-		0.000	0.000	10.286	-
		Subtotal	15.384	1.001		2.023		3.254		-		3.254	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
Prior Year Cumulative Funding	Various	Various : Various	0.361	0.000		0.000		0.000		-		0.000	0.000	0.361	-
Family of Field Medical	Various	MARCORSYSCOM : Quantico, VA	0.000	0.000		0.020	Aug 2018	0.000		-		0.000	0.000	0.020	-
Family of Shelters and Shelter Equipment	Various	MCSC : Quantico, VA	0.000	0.000		0.019	Oct 2017	0.000		-		0.000	0.000	0.019	-
Family of Field Medical	Various	MCSC : Quantico, VA	0.020	0.000		0.093	Mar 2018	0.000		-		0.000	0.000	0.113	-
Individual Warfighting Equipment	C/FP	MCSC : Quantico, VA	0.373	0.087	May 2017	0.078	May 2018	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.754	0.087		0.210		0.000		-		0.000	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	46.258	3.275		4.656		5.412		-		5.412	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

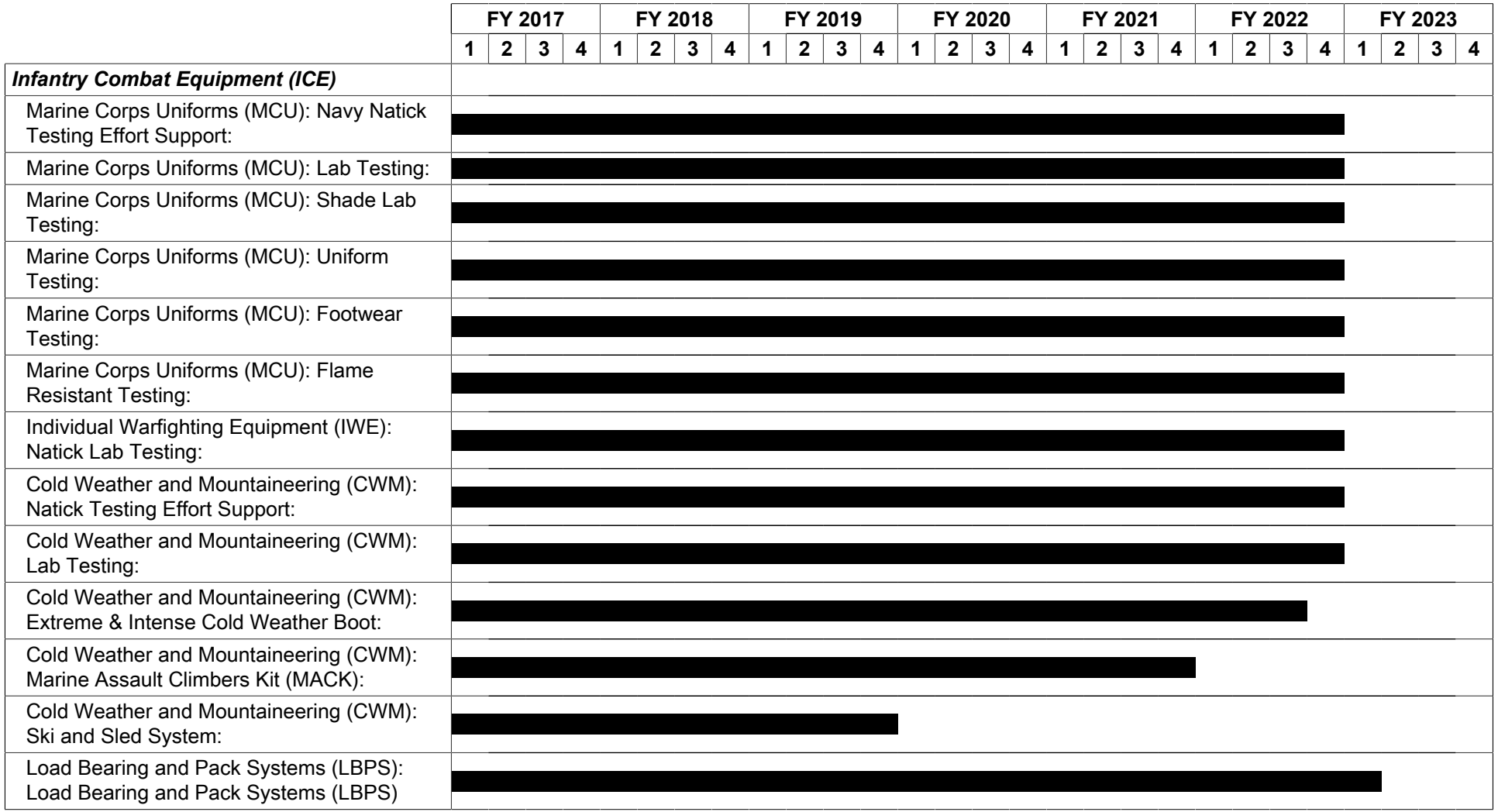


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

	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
Calibration And Maintenance Program (CAMP)																												
Test emerging electronic systems.																												

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2503 / *Initial Issue*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Infantry Combat Equipment (ICE)				
Marine Corps Uniforms (MCU): Navy Natick Testing Effort Support:	1	2017	4	2022
Marine Corps Uniforms (MCU): Lab Testing:	1	2017	4	2022
Marine Corps Uniforms (MCU): Shade Lab Testing:	1	2017	4	2022
Marine Corps Uniforms (MCU): Uniform Testing:	1	2017	4	2022
Marine Corps Uniforms (MCU): Footwear Testing:	1	2017	4	2022
Marine Corps Uniforms (MCU): Flame Resistant Testing:	1	2017	4	2022
Individual Warfighting Equipment (IWE): Natick Lab Testing:	1	2017	4	2022
Cold Weather and Mountaineering (CWM): Natick Testing Effort Support:	1	2017	4	2022
Cold Weather and Mountaineering (CWM): Lab Testing:	1	2017	4	2022
Cold Weather and Mountaineering (CWM): Extreme & Intense Cold Weather Boot:	1	2017	3	2022
Cold Weather and Mountaineering (CWM): Marine Assault Climbers Kit (MACK):	1	2017	4	2021
Cold Weather and Mountaineering (CWM): Ski and Sled System:	1	2017	4	2019
Load Bearing and Pack Systems (LBPS): Load Bearing and Pack Systems (LBPS)	1	2017	1	2023
Calibration And Maintenance Program (CAMP)				
Test emerging electronic systems.	2	2019	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2513 / *Body Armor*	

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
2513: *Body Armor*	48.364	2.712	4.380	4.970	-	4.970	4.773	4.697	4.794	4.892	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Ballistic Protection Systems (BPS) provides the most technologically advanced protection at the lightest weight possible. It provides the critical ballistic protective systems that save lives, reduce the severity of combat injuries, and increase combat effectiveness by keeping more Marines in the fight. Major BPS programs include: Plate Carrier (PC); Enhanced Small Arms Protective Inserts (ESAPI); Light Weight Helmet (LWH); Enhanced Combat Helmet (ECH); Improved Ballistic Eyewear (IBE); and hearing protection. Key Components of all of the BPS programs are adapting ballistic protective systems to the constantly changing threat environment and leveraging emerging technologies to lighten the load and increase the mobility of each Marine.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Ballistic Protection Systems	2.712	4.380	4.970	0.000	4.970
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue research with industry partners towards understanding and developing the future technology associated with next generation PPE (i.e. helmets, body armor, eyewear, and hearing protection). - Continue to research active and passive hearing protection products that provide a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal. - Continue testing for the next generation of eyewear, specifically the capability to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments. - Complete testing on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability.					
FY 2019 Base Plans: - Continue research with industry partners towards understanding and developing the future technology associated with next generation PPE (i.e. helmets, body armor, eyewear, and hearing protection). - Continue to research active and passive hearing protection products that provide a sense of presence and protection against transient impact noise and blocks and/or reflects harmful blast shock wave in the ear canal. - Continue testing for the next generation of eyewear, specifically the capability to adjust rapidly in varying light conditions in order to gap the need for rapid situational awareness in different light environments.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2513 / *Body Armor*

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 on the efficacy of plates as they age over time in order to obtain a clear understanding of the need to consistently sustain and maintain current plates, as well as, their future ballistic capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** RDT&E funding increases $.590 from FY18 to FY19 to develop, research, and test emerging technology and advancements in products and materials related to protective equipment.					
Accomplishments/Planned Programs Subtotals	2.712	4.380	4.970	0.000	4.970

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Marine Corps Ballistic Protection Systems (BPS) research, development, testing & evaluation activities include seeking new developments in ballistic technology that feature reductions in weight, improvements in ballistic performance, enhanced operational effectiveness through improved product designs and the application of new material technologies to reduce total ownership costs by improving the expected service life of fielded systems. In order to accomplish these goals, Program Manager-Infantry Combat Equipment uses a broad array of government and contractor performers to achieve the desired end state. This includes partnerships with government entities and research and development contracts and partnership intermediaries where applicable. The Marine Corps also leverages advancements in industry capabilities to rapidly field non-developmental and commercially available off the shelf armor solutions. Performance is confirmed by characterizing ballistic performance and data collected during user evaluations.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2513 / *Body Armor*

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
Ballistic Protection Systems	MIPR	AFRL/MILTECH : Wright Patterson,OH	3.788	0.771	May 2017	0.530	May 2018	0.450	May 2019	-		0.450	Continuing	Continuing	Continuing
Ballistic Protection Systems	Various	MCSC : Quantico, VA	0.214	0.144	Sep 2017	0.526	May 2018	0.350	May 2019	-		0.350	0.000	1.234	-
Ballistic Protection Systems	WR	NSWC : Dahlgren, VA	0.000	0.204	May 2017	0.273	Nov 2017	0.280	Nov 2018	-		0.280	0.000	0.757	-
Ballistic Protection Systems	MIPR	USA NSRDEC : Natick MA	9.365	0.112	Mar 2017	0.144	Dec 2017	0.160	Dec 2018	-		0.160	0.000	9.781	-
Ballistic Protection Systems	C/FFP	NRL : Washington DC	16.439	0.000		0.535	Mar 2018	0.500	Mar 2019	-		0.500	0.000	17.474	-
Ballistic Protection Systems	MIPR	Tobyhanna : Tobyhanna, PA	0.000	0.000		0.045	Dec 2017	0.060	Dec 2018	-		0.060	0.000	0.105	-
PY Cumulative Funding	Various	Various : Various	1.886	0.000		0.000		0.000		-		0.000	0.000	1.886	-
		Subtotal	31.692	1.231		2.053		1.800		-		1.800	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
Ballistic Protection Systems	Various	MCSC : Quantico, VA	0.000	0.000		0.219	Aug 2018	0.000		-		0.000	0.000	0.219	-
Ballistic Protection Systems	MIPR	CECOM : MITRE	0.000	0.054	Mar 2017	0.000	Mar 2018	0.076	Mar 2019	-		0.076	0.000	0.130	-
Ballistic Protection Systems	MIPR	USA NSRDEC: : Natick, MA	0.000	0.351	Feb 2017	0.687	Feb 2018	0.650	Feb 2019	-		0.650	0.000	1.688	-
Ballistic Protection Systems	MIPR	NCTRF: : Natick, MA	0.000	0.371	Feb 2017	0.170	Feb 2018	0.270	Feb 2019	-		0.270	0.000	0.811	-
		Subtotal	0.000	0.776		1.076		0.996		-		0.996	0.000	2.848	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2513 / *Body Armor*	

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
Ballistic Protection Systems	MIPR	USA NSRDEC : Natick, MA	7.687	0.000		0.214	Apr 2018	0.300	Apr 2019	-		0.300	0.000	8.201	-
Ballistic Protection Systems	MIPR	USA ATC : Aberdeen Prv Grnd, MD	0.947	0.351	Jul 2017	0.727	May 2018	0.800	May 2019	-		0.800	Continuing	Continuing	Continuing
Ballistic Protection Systems	WR	NRL : Washington, DC	3.126	0.289	Feb 2017	0.000	Dec 2017	0.300	Dec 2018	-		0.300	Continuing	Continuing	Continuing
Ballistic Protection Systems	MIPR	ARL : Various	0.488	0.000		0.183	Dec 2017	0.200	Dec 2018	-		0.200	0.000	0.871	-
Ballistic Protection Systems	WR	NAVAL Health research Center : Arlington, VA	0.000	0.000		0.000	Dec 2017	0.094	Dec 2018	-		0.094	0.000	0.094	-
Ballistic Protection Systems	WR	MCOTEA : Quantico, VA	0.000	0.000		0.000	Oct 2017	0.300	Oct 2018	-		0.300	0.000	0.300	-
Ballistic Protection Systems	WR	NSWC : Indian Head, MD	0.148	0.040	May 2017	0.000		0.000		-		0.000	0.000	0.188	-
Ballistic Protection Systems	MIPR	NAVSEA : Washington, DC	0.078	0.025	Jun 2017	0.000		0.000		-		0.000	0.000	0.103	-
Ballistic Protection Systems	Various	MCSC : Quantico, VA	0.000	0.000		0.127	May 2018	0.180	Jun 2019	-		0.180	0.000	0.307	-
Prior Year Cumulative Funding	Various	Various : Various	4.198	0.000		0.000		0.000		-		0.000	0.000	4.198	-
		Subtotal	16.672	0.705		1.251		2.174		-		2.174	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	48.364	2.712		4.380		4.970		-		4.970	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2513 / *Body Armor*

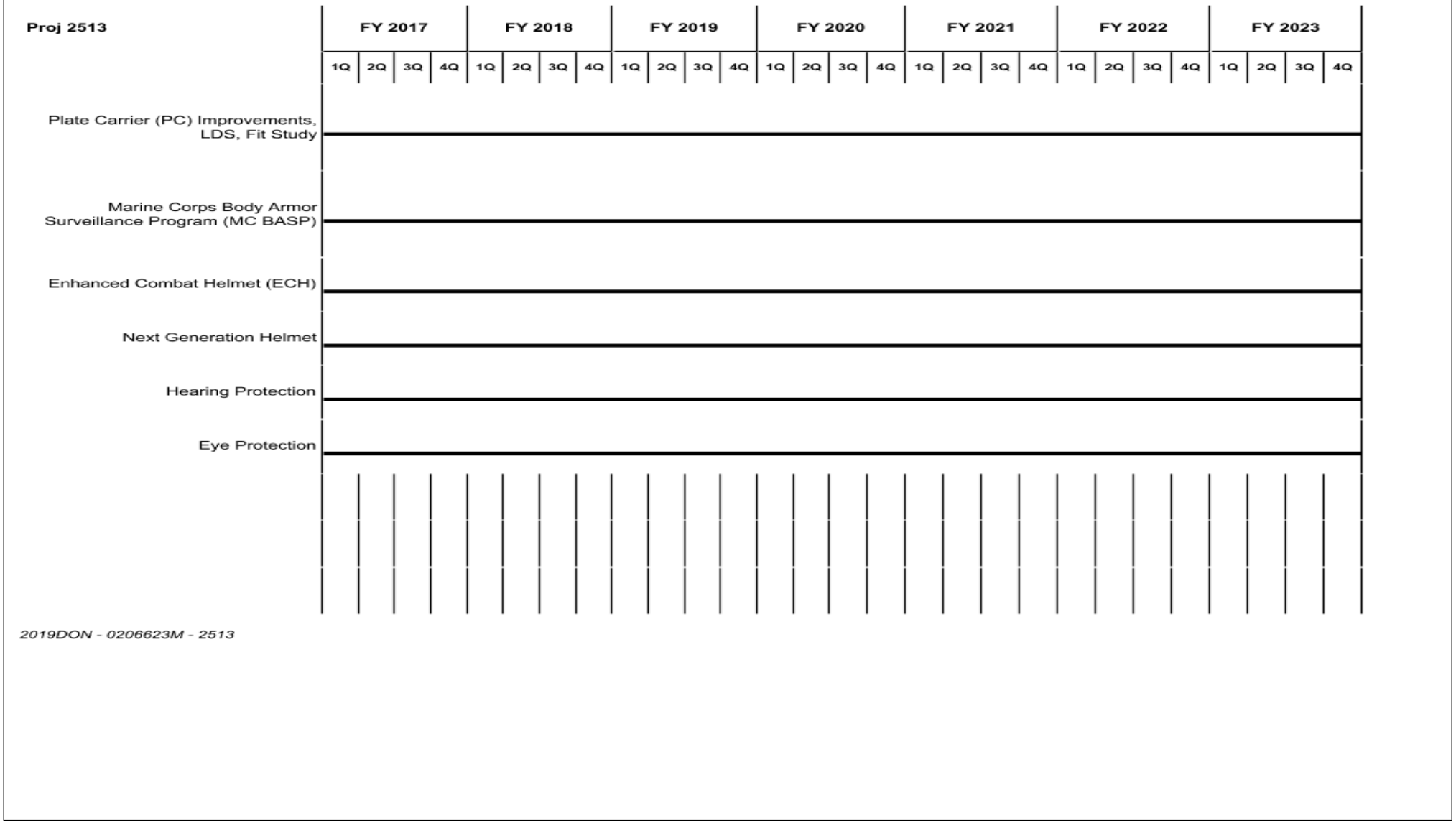


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2513 / *Body Armor*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2513				
Plate Carrier (PC) Improvements, LDS, Fit Study: Plate Carrier (PC) Improvements, Fit Study	1	2017	4	2023
Marine Corps Body Armor Surveillance Program (MC BASP): Marine Corps Body Armor Surveillance Program (MC BASP)	1	2017	4	2023
Enhanced Combat Helmet (ECH): Enhanced Combat Helmet (ECH)	1	2017	4	2023
Next Generation Helmet: Next Generation Helmet	1	2017	4	2023
Hearing Protection: Hearing Protection	1	2017	4	2023
Eye Protection: Eye Protection	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2928 / *Exp Indirect Fire Gen Supt Wpn 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
2928: *Exp Indirect Fire Gen Supt Wpn Sys*	12.780	1.011	2.990	22.748	-	22.748	22.095	2.143	2.187	2.231	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

High Mobility Artillery Rocket Systems (HIMARS) is a C-130 transportable, wheeled, indirect fire, rocket/missile system capable of firing all rockets and missiles in the current and future Multiple Launch Rocket System (MLRS) Family of Munitions (MFOM). The system includes one launcher, two Re-Supply Systems, and the MFOM. HIMARS provides the Marine Air-Ground Task Force (MAGTF)with 24 hour ground-based, responsive General Support/General Support Reinforcing (GS/GSR) indirect fires which accurately engage targets at long range (60+km), with high volumes of lethal fire under all weather conditions throughout all phases of combat operations ashore, to include irregular warfare and distributed operations. HIMARS is a significant improvement over previously fielded ground fire support systems. Anti-ship capability is being added to HIMARS Battalions to support USN/USMC Littoral operations. The USMC plans to adopt U.S. Army and U.S. Navy Anti-ship missiles and integrate them onto a remotely operated launcher, which will fit within the existing HIMARS Battalion force structure.

The GMLRS integrates a multi-mode fuse and high explosive warhead making it an all-weather, precision strike rocket. GMLRS U have been fired in support of Overseas Contingency Operations (OCO), and has demonstrated high effectiveness and low collateral damage while supporting Marines in combat. GMLRS AW was developed to replace GMLRS-DPICM and meet the requirements outlined in a 25 June 2008 cluster munitions policy. The Reduced Range Practice Rocket (RRPR) includes training devices for tactical training, classroom training and handling exercises.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: HIMARS Expeditionary & Naval Integration Capabilities	1.011	2.990	22.748	0.000	22.748
Articles:	-	-	-	-	-
FY 2018 Plans: -Complete expeditionary radio integration. -Initiate research and development of HIMARS Anti-Ship capability (Moving Target).					
FY 2019 Base Plans: -Continue research, development and integration of HIMARS Anti-Ship capability (Moving Target). -Initiate, build and conduct initial performance testing of an anti-ship missile on a USMC launcher -Initiate integration and testing of anti-ship missile capability onto the USMC HIMARS battalions.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2928 / *Exp Indirect Fire Gen Supt Wpn Sys*

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 increase of 19.758M from FY18 to FY19 is due to initiation of the integration and test of an anti-ship missile capability into the USMC HIMARS battalions.					
Accomplishments/Planned Programs Subtotals	1.011	2.990	22.748	0.000	22.748

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/BLI 221200: *High Mobility Artillery Rocket System (HIMARS)*	49.704	65.303	134.246	-	134.246	146.038	150.306	68.255	119.365	Continuing	Continuing

Remarks

D. Acquisition Strategy

R&D efforts for USMC HIMARS follow Expeditionary Force 21 guidance for the capability to employ HIMARS from distributed locations, naval platforms or surface connectors to support distributed maneuver. Support the continued development of long-range precision fire capabilities for HIMARS from austere and expeditionary bases and to improve the range and capacity to provide fires supporting multiple entry points from the sea. Integration will consist of design support from a combination of Army/Navy labs as well as multiple contractors for development and integration. The Marine Corps strategy incorporates acquisition and capability upgrades to both the launcher systems and rocket munitions. To the greatest extent possible, these improvements parallel the U.S. Army's and U.S. Navy's acquisitions.

E. Performance Metrics

Milestone Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2928 / *Exp Indirect Fire Gen Supt Wpn 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
HIMARS Anti-ship Capabilities	Various	Various : Various	0.000	0.000		0.677	Jan 2018	19.295	Jan 2019	-		19.295	0.000	19.972	-
Expeditionary radio capabilities	MIPR	RDEC : Redstone Arsenal, AL	0.443	1.011	Dec 2016	1.636	Jan 2018	0.000		-		0.000	0.000	3.090	-
Expeditionary Communication Capabilities	Various	Various : Various	0.873	0.000		0.677	Jan 2018	0.000		-		0.000	0.000	1.550	-
		Subtotal	1.316	1.011		2.990		19.295		-		19.295	0.000	24.612	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
HIMARS Anti-ship Capabilities	Various	various : various	0.000	0.000		0.000		3.453	Nov 2018	-		3.453	0.000	3.453	-
Prior year cumulative funding	Various	various : various	5.820	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	5.820	0.000		0.000		3.453		-		3.453	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
Prior year cumulative funding	Various	Various : Various	5.644	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	5.644	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	12.780	1.011		2.990		22.748		-		22.748	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 2928 / *Exp Indirect Fire Gen Supt Wpn Sys*	

	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 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2928 / *Exp Indirect Fire Gen Supt Wpn Sys*

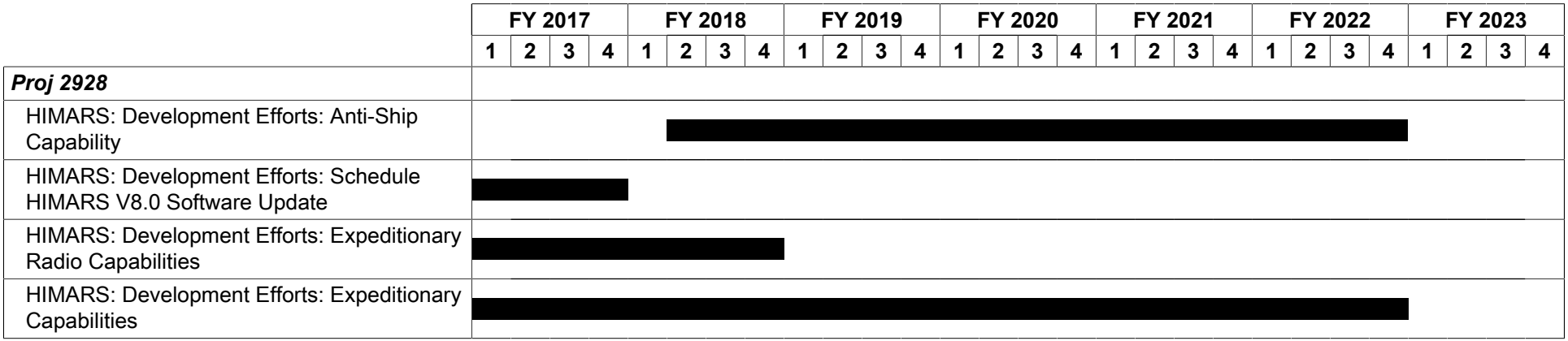


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 2928 / *Exp Indirect Fire Gen Supt Wpn Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2928				
HIMARS: Development Efforts: Anti-Ship Capability	2	2018	4	2022
HIMARS: Development Efforts: Schedule HIMARS V8.0 Software Update	1	2017	4	2017
HIMARS: Development Efforts: Expeditionary Radio Capabilities	1	2017	4	2018
HIMARS: Development Efforts: Expeditionary Capabilities	1	2017	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 3098 / *Fire 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
3098: *Fire Support System*	151.783	8.318	6.145	5.999	-	5.999	7.792	6.868	3.112	3.196	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Fire Support System (FSS) provides the Marine Corps critical operational and logistics capabilities in artillery weapons, fire direction and targeting systems. This includes the following projects:

The Modeled Meteorological Information Manager (MMIM) is the primary artillery meteorological capability at the artillery battalion and regiment providing the ability to create, receive, manage, and transmit near real time gridded meteorological information supporting artillery and target acquisition systems.

Expeditionary Fire Support System (EFSS) is an all-weather, ground based indirect fire system designed to support the vertical assault element of the Ship-To-Objective Maneuver (STOM) force. The EFSS is defined as a Launcher, Mobility Platform (prime mover), Ammunition, Ammunition Supply Vehicle, and Technical Fire Direction and Control equipment necessary for orienting weapons to an azimuth of fire. EFSS supports irregular warfare and distributed operations. FY18 to FY19 reduction is due to removal of EFSS from USMC inventory and termination of PERM development.

The Fire Support Mod Line (FSML) is a set of Marine Corps efforts to address critical operational and logistics deficiencies in existing, fielded fire support/weapons systems and equipment. FSML provides technical refresh and development of target acquisition, artillery survey, meteorological systems, weapon systems, and fire direction control. Funding is used to ensure Clinger Cohen Act (CCA) and Information Assurance (IA) requirements are met. Provides execution of product improvements/modifications, and upgrades to system hardware and software for the Ground Counter Fire Sensor (GCFS), Marine Artillery Survey Set (MASS), Modeled Meteorological Information Manager (MMIM), Global Positioning System Survey (GPS-S) and the Improved Position Azimuth Determining System (IPADS), Lightweight Target Designator (LTD), the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD), and the Common Laser Range Finder (CLRF). Funding is also used for upgrades, engineering change proposals (ECPs), and modifications for guided munitions and fire control systems which fall within Fire Support Systems for the Marine Corps.

Family of Artillery Munitions (FAM) funding is used to develop and mature artillery munitions for the Marine Corps triad of fire and includes conducting safety analysis and ship compatibility studies.

The Common Laser Range Finder Integrated Capability (CLRF IC) is an association of targeting systems that provide handheld, lightweight, man portable devices supporting the employment of air and surface fires. They provide foot mobile users the ability to locate, identify, mark and designate targets in both day and night conditions for engagement by fire support and weapons platforms. CLRF IC systems support the collection and dissemination of targeting information to maneuver, fire support, and intelligence personnel via external digital devices such as the Advanced Field Artillery Tactical Data System (AFATDS) and the Target Handoff System (THS) using associated Combat Net Radios. The CLRF IC includes two major components; The CLRF IC Laser Range Finder(LRF) supports the requirement to

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

locate and transmit targeting information while the Future Targeting System combines the capabilities of the LRF with the ability to designate for specific requirements associated with laser guided munitions.

The Family of Internally Transportable Vehicles (FITV), including Utility Task Vehicles (UTVs), are light weight and internally transportable in the V-22, CH-53D & CH53E helos. The FITV provide deployed Marine Air-Ground Task Force (MAGTF) and Marine Expeditionary Unit (Special Operations Capable) (MEU (SOC)) with vehicles that are internally transportable in selected rotary and fixed wing aircraft. The FITV are expeditionary vehicles supporting over-the-horizon amphibious operations, irregular warfare and enhanced company operations. It is then fielded to Reconnaissance, Marine Corps Forces Special Operations Command (MARSOC), and artillery batteries as part of the Expeditionary Fire Support System (EFSS). The FITV also provide Special Operations Forces (SOF) with platforms to support their primary and secondary missions. Speed, maneuverability, and the use of cover and concealment are the crew's primary means of survival. In FY20 the Marine Corps will establish the Internally Transportable Vehicle Replacement (ITV-R) initiative. The ITV-R will replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV).

Conventional Ground Ammunition is a project that identifies and develops Insensitive Munitions (IM) Technologies to address IM shortfalls in new Marine Corps development or improvements to legacy Conventional Ground Ammunition to meet OSD mandated IM compliance requirements. These IM Technology investments directly support the development of the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP) to address the identified IM technology needs of the 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
Title: Modeled Meteorological Information Manager (MMIM)	0.568	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The Modeled Meteorological Information Manager (MMIM) is the primary artillery meteorological capability at the artillery battalion and regiment providing the ability to create, receive, manage, and transmit near real time gridded meteorological information supporting artillery and target acquisition systems significantly enhancing the accuracy of meteorological information.					
FY 2018 Plans: - Starting in FY18 MMIM is no longer being tracked as a separate element and is included in Fire Support Mods element listed below.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
No change from FY 2018 to FY 2019.					
Title: Expeditionary Fire Support Systems (EFSS)	4.723	2.293	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: EFSS is an all-weather, ground based indirect fire system designed to support the vertical assault element of the Ship-To-Objective Maneuver (STOM) force. EFSS is defined as a Launcher, Mobility Platform (prime mover), Ammunition, Ammunition Supply Vehicle, and Technical Fire Direction and control equipment necessary for orienting weapons to an azimuth of fire. EFSS supports irregular warfare and distributed operations. ***FY 2018 Plans:*** FY18 to FY19 reduction is due to removal of EFSS from USMC inventory and termination of PERM development. - Closeout of Raytheon Contract for PERM program. - Closeout process with EFSS government facilities (NSWC DD, LOGCOM) for shipping mortars,logistics support, and engineering for PERM/EFSS. ***FY 2019 Base Plans:*** The FY 2019 funding request was reduced by $1.267 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:*** The decrease of $2.293M from FY18 to FY19 is due to removal of EFSS from USMC inventory and termination of PERM development.					
Title: Fire Support Mods (FSM)	1.091	2.750	2.511	0.000	2.511
Articles:	-	-	-	-	-
Description: Funding is used for upgrades, engineering change proposals (ECP), and modifications to system hardware and software for the Ground Counter Fire Sensor (GCFS), Marine Artillery Survey Set (MASS), Meteorological Information Manager (MMIM), Global Positioning System Survey (GPS-S), the Improved Position Azimuth Determining System (IPADS), and the Joint Terminal Attack Controller-Laser Target Designator (JTAC-LTD) as well as technical refresh for target acquisition, and artillery survey and meteorological systems. Funding					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
is also used for upgrades, Engineering Change Proposals (ECPs) and modifications for guided munitions and fire control systems which falls within Fire Support Systems for the Marine Corps. ***FY 2018 Plans:*** - Continue development of acoustic detection system to replace GCFS system. - Continue product improvements to increase performance capability of legacy targeting and other fire support systems. - Continue development of advanced components for the IPADS replacement system. - Initiate Modeled Meteorological Manager (MMIM)communication testing with a Global Broadcast Service (GBS) Portal Receiver Suite (PRS). ***FY 2019 Base Plans:*** - Continue development of GCFS replacement components for operational usage and obsolescence management. - Continue product improvements to increase performance capability of legacy targeting and other fire support systems. - Continue development of advanced components for the IPADS replacement system. - Complete Modeled Meteorological Manager (MMIM)communication testing with a Global Broadcast Service (GBS) Portal Receiver Suite (PRS). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.239M from FY18 to FY19 is due to reduced Modeled Meteorological Manager (MMIM) Software Development efforts.					
Title: Family of Artillery Munitions (FAM) ***Articles:*** ***Description:*** FAM - Efforts include acquisition planning for future munitions, replacement of existing stockpiles, and providing technologically enhanced artillery munitions in order to mitigate/fill capability gaps in range, accuracy, and lethality and reduce undue logistical burden. Additionally, the program office addresses Weapon System Explosives Safety Review Board (WSESRB) requirements for naval transportation issues for all artillery projectiles, propellants, and fuzes.	0.297 -	0.316 -	0.321 -	0.000 -	0.321 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support 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: -Continue to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for Dual Purpose Improved Conventional Munitions (DPICM) replacement munition and Precision Guidance Kit (PGK) anti-jam development. ***FY 2019 Base Plans:*** -Continue to monitor and support joint development with U.S. Army artillery ammunition programs in order to leverage and influence Army developmental efforts. Provide USMC specific safety analysis for Dual Purpose Improved Conventional Munitions (DPICM) replacement munition and Precision Guidance Kit (PGK) 150mm no function software upgrade, and anti-jam development. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase of $.005M from FY18 to FY19 is a result of inflationary indices.					
Title: Common Laser Range Finder (CLRF)	0.000	0.000	3.167	0.000	3.167
Articles:	-	-	-	-	-
Description: The Common Laser Range Finder Integrated Capability (CLRF IC) is an association of targeting systems that provide handheld, lightweight, man portable devices to support the employment of air and surface fires. They provide foot mobile users the ability to locate, identify, mark and designate targets in both day and night conditions for engagement by fire support and weapons platforms. CLRF IC systems support the collection and dissemination of targeting information to maneuver, fire support, and intelligence personnel via external digital devices such as the Advanced Field Artillery Tactical Data System (AFATDS) and the Target Handoff System (THS) using associated Combat Net Radios. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Initiate development of the Future Targeting System (FTS) to replace current fielded laser designators and spot imager into a single foot mobile capability. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support 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 ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $3.167M in FY19 from FY18 is due to initiation of development of the Future Targeting System (FTS).					
Title: Family of Internally Transportable Vehicle (FITV) ***Articles:*** ***Description:*** Family of Internally Transportable Vehicle (FITV) program fields expeditionary vehicles to ground units to support various operations. Provides the Marine Air-Ground Task Force (MAGTF) ground combat units with vehicles transportable in the MV-22 and CV-22 tilt-rotor aircraft as well as the CH53. ***FY 2018 Plans:*** -Continue streamlined acquisitions of Commercial-Off-the-Shelf/Non-Developmental Items (COTS/NDI) that can be identified, integrated and tested in a short amount of time. FITV funding will continue modifications required to increase the FITV system readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, Service Life Extension Programs (SLEPs), or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF). ***FY 2019 Base Plans:*** FY19 and out decrease is due to realignment from project 3098, Fire Support Systems, to project 3775 Family of Internally Transportable Vehicles. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease of -$0.253 from FY18 to FY19 is due to realignment from project 3098, Fire Support Systems, to project 3775 Family of Internally Transportable Vehicles.	1.160 -	0.253 -	0.000 -	0.000 -	0.000 -
Title: Conventional Ground Ammunition ***Articles:*** ***Description:*** All DoD services are required to field munitions that are insensitive munitions (IM) compliant. IM compliancy is measured by the performance of munitions to six tests; Fast Cook-Off, Slow Cook-Off, Bullet Impact,	0.479 -	0.533 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Fragment Impact, Sympathetic Detonation, and Shape Charge Jet. Services are required to submit IM Strategic Plans annually delineating how they intend on executing their Service IM effort to maximize IM improvements to both new development and legacy conventional ground ammunition. These IM Strategic Plans, Supporting Plan of Actions, and Milestones, with funding trial, are submitted to the JROC, demonstrating each Service's commitment to the continuing effort to improve IM characteristics of Conventional Ground Ammunition, for approval. In order to achieve the system's IM performance, the Conventional Ground Ammunition developer/ owner must have new technology identified and available to address IM shortfalls at the onset of the ammunition development or available for insertion during improvement opportunities for legacy ammunition. Under this program, the USMC invests in IM technology which will improve its existing munitions IM reactions or ability to reliably initiate IM technologies and complies with the OSD mandate for maximum feasible IM compliance. ***FY 2018 Plans:*** Continue - (1) Develop Insensitive Munitions (IM) Compliant 120mm Tail Charge (U.S. Army Armament Research Development and Engineering Center, Picatinny NJ) -Complete ballistic testing of new TCA design and integrate IM technology into weapon. (2) Develop Mk22 Mod 4 (J143) Rocket Motor Slow Cook-off Mitigation (Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD) -FY18 effort includes rocket motor vulnerability effects study and engineering hardware design and validation. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 and out decrease is due to the realignment of funding from project 3098, Conventional Ground Ammunition to project 3774 Marine Corps Ammo.					
Accomplishments/Planned Programs Subtotals	8.318	6.145	5.999	0.000	5.999

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

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/2064: *Expeditionary Fire Support Systems*	2.688	0.626	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	93.376
• PMC/473301: *Modeled Meterological Information Manager (MMIM)*	0.396	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	8.310
• PMC/473302: *Fire Support Mods*	5.647	4.114	4.158	5.583	9.741	4.303	4.416	4.552	4.643	Continuing	Continuing
• PMC/6545: *Family of ITV*	9.282	1.583	0.606	-	0.606	0.648	4.022	5.957	8.831	0.000	131.967
• PMC/473300: *Common Laser Range Finder (CLRF)*	7.017	18.196	15.904	-	15.904	12.960	0.987	43.376	43.563	0.000	142.003

Remarks

D. Acquisition Strategy

These programs range from off-the-shelf modifications to developmental items. Development will typically be conducted at government labs.

Expeditionary Fire Support System (EFSS) and the Precision Extended Range Munition (PERM):
EFSS: Closeout procedures due to MROC decision.
PERM: Closeout procedures due to MROC decision.

Fire Support Mods:
Develop an improved Acoustic Sensor capability by exploiting recent technology improvements in computation and networking to improve data fusion. An early prototype is anticipated in FY19. The improved acoustic sensor will be capable of transmitting digital information via JVMF to AFATDS in support of artillery and counter fire operations. Initiate coordination between the Army's Armament, Research and Development Engineering Center (ARDEC), and MCSC's and NSWC DD science and technology efforts to commence development of the Future Survey System. Continue liaison with the Army's PM TAS in order to leverage future efforts and increase the probability of a joint procurement. Initiate development of a MMIM communications reach back capability to allow for ingestion of meteorological data into artillery firing data for units deployed to austere locations with limited or no bandwidth communications. Procure hardware and software refreshes for the GPSS, MASS and MMIM to ensure compliance with cybersecurity policies, address obsolescence and interoperability with other C2 systems.

Family of Artillery Munitions (FAM):
Program includes four (4) artillery munitions which are being developed by the Army. The Army is the lead service for these programs but continues to interact with the FAM IPT to ensure USMC requirements and capability needs are met. This allows the USMC to become users of the munition and certify the round for naval transportation. The munitions include but are not limited to; Dual Purpose Improved Conventional Munitions (DPICM), XM1156 Precision Guidance Kit (PGK), M1122

and M1123 Infrared (IR) and M1124 Visual Light (VL) 155mm RAP Round. Each munitions' status is tracked to ensure Marine Corps requirements are satisfied throughout the systems lifecycle.

Common Laser Range Finder (CLRF):
The Common Laser Range Finder Integrated Capability (CLRF IC) will develop the Future Targeting System (FTS) to replace current fielded laser designators and spot imager into a single foot mobile capability and implement targeted Engineering Change Proposals into the currently fielded target location device to provide Joint Fires Observers and Joint Terminal Attack Controllers a single lightweight mission defined device that meets future operational requirements and extends the equipment service life to 2035. FTS will be procured via a full and open competition.

Family of Internally Transportable Vehicles (FITV):
The FITV program strategy is to explore, research and recommend efforts to address and identify solutions to reliability and safety design issues through government off-the-shelf (GOTS), commercial off-the-shelf (COTS) or modified off-the-shelf (MOTS) components. This includes the efforts to begin to replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV).

Conventional Ground Ammunition:
The Conventional Ground Ammunition strategy is to invest in Insensitive Munitions (IM) technologies to address IM shortfalls of priority programs identified in the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP). Once the IM technologies have been successfully demonstrated and matured, the intent is to insert the new technologies into new conventional ground ammunition development as well as provide opportunities to improve legacy munitions IM characteristics. The IM R&D effort directly addresses the mandated OSD requirement to obtain incremental IM improvement in pursuit of becoming fully IM compliant to the maximum extent practicable.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 3098 / *Fire Support 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
Prior Year Cumulative Funding	Various	Various : Various	116.985	0.000		0.000		0.000		-		0.000	0.000	116.985	-
CLRF	C/CPIF	TBD : TBD	0.000	0.000		0.000		3.167	Feb 2019	-		3.167	Continuing	Continuing	Continuing
Fire Support Mods	WR	NAVSEA : Washington, DC	0.509	0.000		0.200	Feb 2018	0.000		-		0.000	0.000	0.709	-
PERM TFT Development	MIPR	U.S. Army Armament : Picatinny, NJ	0.000	0.337	Jan 2017	0.000		0.000		-		0.000	0.000	0.337	-
Conventional Ground Ammunition	MIPR	ARDEC : Picatinny, NJ	1.272	0.220	Apr 2017	0.238	Jan 2018	0.000		-		0.000	0.000	1.730	-
PERM Closeout	C/FPIF	Raytheon : Tucson, AZ	0.000	0.000		1.898	Apr 2018	0.000		-		0.000	0.000	1.898	-
Conventional Ground Ammunition	MIPR	U.S. Army Armament : Picatinny, NJ	0.488	0.200	May 2017	0.245	Jan 2018	0.000		-		0.000	0.000	0.933	-
Fire Support Mods	MIPR	ARDEC : Picatinny, NJ	0.400	0.451	Feb 2017	1.450	Apr 2018	1.328	Jan 2019	-		1.328	0.000	3.629	-
Fire Support Mods	WR	NSWC : Dahlgren, VA	0.426	0.303	Jan 2017	0.680	Jan 2018	0.390	Jan 2019	-		0.390	0.000	1.799	-
MMIM	WR	MCTSSA : San Diego, CA	0.000	0.110	Dec 2016	0.000		0.000		-		0.000	0.000	0.110	-
Fire Support Mods	WR	MCTSSA : San Diego, CA	0.000	0.000		0.100	Feb 2018	0.473	Mar 2019	-		0.473	0.000	0.573	-
Fire Support Mods	MIPR	Army Research Lab : Adelphi, MD	11.009	0.337	Jan 2017	0.200	Jan 2018	0.200	Jan 2019	-		0.200	0.000	11.746	-
MMIM	MIPR	Army Research Lab : Adelphi, MD	0.894	0.458	Jan 2017	0.000		0.000		-		0.000	0.000	1.352	-
		Subtotal	131.983	2.416		5.011		5.558		-		5.558	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 3098 / *Fire Support 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
EFSS Logistic Closeout	WR	NSWC : Dahlgren, VA	0.000	0.000		0.395	May 2018	0.000		-		0.000	0.000	0.395	-
EFSS & PERM Safety Support	WR	NSWC : Dahlgren, VA	0.270	0.000		0.000		0.000		-		0.000	0.000	0.270	-
FITV Engineering Support	C/CPFF	NATC : Silver Springs, Nevada	0.000	0.000		0.253	Dec 2017	0.000		-		0.000	0.000	0.253	-
Prior Years Cumulative Funding	Various	Various : Various	2.615	0.000		0.000		0.000		-		0.000	0.000	2.615	-
FAM Engineering Support	WR	NSWC : Dahlgren, VA	2.455	0.297	Mar 2017	0.316	Jan 2018	0.321	Jan 2019	-		0.321	0.000	3.389	-
		Subtotal	5.340	0.297		0.964		0.321		-		0.321	0.000	6.922	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
EFSS (PERM) 2nd incr.	WR	NSWCDD : Dahlgren, Va	0.000	1.607	Nov 2017	0.000		0.000		-		0.000	0.000	1.607	-
Fire Support Mods	WR	MCTSSA : San Diego, CA	0.000	0.000		0.120	Feb 2018	0.120	Dec 2018	-		0.120	0.000	0.240	-
FITV Snow Mobility Test	C/BOA	NATC : Carson City, NV	0.000	1.160	Aug 2017	0.000		0.000		-		0.000	0.000	1.160	-
Conventional Ground Ammunition	WR	NRL : Blossom Point, MD	0.000	0.000		0.050	Jul 2018	0.000		-		0.000	0.000	0.050	-
Conventional Ground Ammunition	WR	NSWC : Dahlgren, VA	0.000	0.059	Sep 2017	0.000		0.000		-		0.000	0.000	0.059	-
Prior Year Cumulative Funding: Fire Support Mods	Various	Various : Various	8.549	0.000		0.000		0.000		-		0.000	0.000	8.549	-
EFSS (PERM)	WR	NSWCDD : Dahlgren, VA	5.385	2.779	Dec 2016	0.000		0.000		-		0.000	0.000	8.164	-
		Subtotal	13.934	5.605		0.170		0.120		-		0.120	0.000	19.829	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support 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
Prior Year Cumulative Funding	Various	Various : Various	0.526	0.000		0.000		0.000		-		0.000	0.000	0.526	-
		Subtotal	0.526	0.000		0.000		0.000		-		0.000	0.000	0.526	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	151.783	8.318		6.145		5.999		-		5.999	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

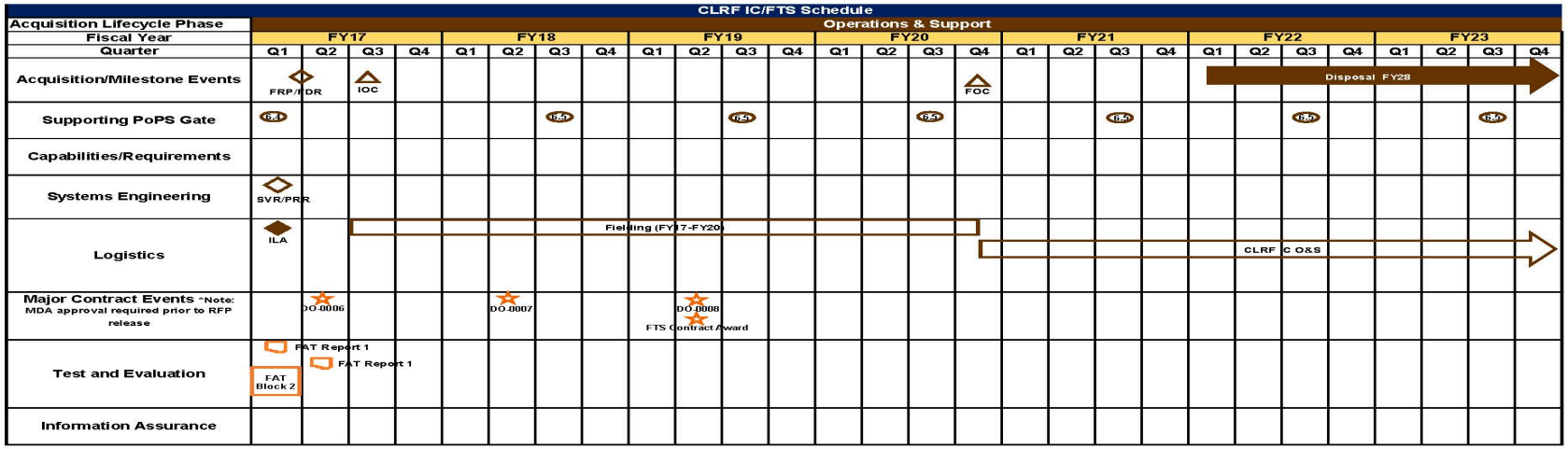


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

Fire Support Mods Program Schedule

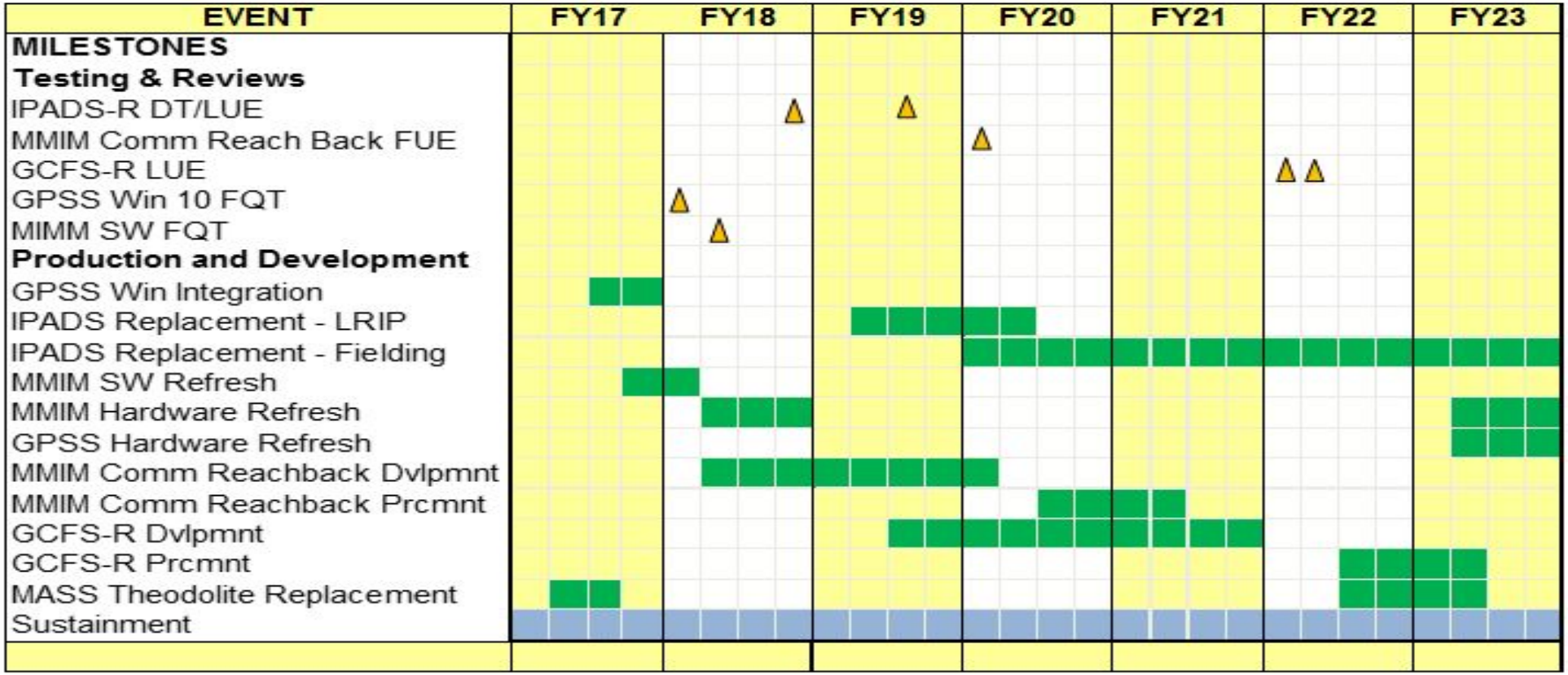


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3098 / *Fire Support System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3098				
EFSS - PERM: MROC Devestiture Decsion	4	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 3774 / *Marine Corps Ammo*	

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
3774: *Marine Corps Ammo*	0.000	0.000	0.000	1.321	-	1.321	1.306	1.312	1.319	1.334	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, Fire Support Systems funding has been realigned from project 3098, Fire Support Systems to project 3774, Marine Corps Ammo. Realignment of efforts to new projects in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

Ammunition Life Cycle Management Program responsibility for Total Life Cycle Management for ground conventional munitions. Accordingly, PM Ammo is a member of the joint services Ammunition Logistics Research and Development IPT (ALR&D IPT). Each year the IPT solicits R&D projects from all of the services. The IPT looks for innovative ideas to enhance logistical support for munitions. Approximately 20 Ammo Logistics R&D projects are voted on each year by the IPT. They are prioritized by voting actions of the Senior Review Board and funding sources are identified. Since the funding for ammunition procurement is outpaced by annual expenditures, ammunition logistics R&D projects designed to extend the shelf life of our current inventory, provide enhanced packaging to "lighten the load" of our munitions, and other such projects will go a long way to ensure the Marine Corps can maintain combat readiness with a reliable conventional ammunition inventory into the future.

Conventional Ground Ammunition is a project that identifies and develops Insensitive Munitions (IM) Technologies to address IM shortfalls in new Marine Corps development or improvements to legacy Conventional Ground Ammunition to meet OSD mandated IM compliance requirements. These IM Technology investments directly support the development of the bi-annual Marine Corps Insensitive Munitions Strategic Plan (IMSP) to address the identified IM technology needs of the 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
Title: Ammunition Life Cycle Management	0.000	0.000	0.803	0.000	0.803
Articles:	-	-	-	-	-
FY 2018 Plans: Previously funded in Project C2086.					
FY 2019 Base Plans: - Continue to support the Propellant Temperature project, Emergency Resupply project, automated site planning project, the Logistics Study for Additive Manufacturing, and a new project aimed at reducing the weight of ammunition packaging.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3774 / *Marine Corps Ammo*

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 the $.803 is due to funds being realigned from C2086 to C3774 in FY19 and out.					
Title: Conventional Ground Ammunition	0.000	0.000	0.518	0.000	0.518
Articles:	-	-	-	-	-
FY 2018 Plans: Previously funded in Project 3098. ***FY 2019 Base Plans:*** The FY19 increase is due to the realignment of funding from project 3098, Fire Support Systems to project 3774, Marine Corps Ammo. Continue (1) Mk22 Mod 4 (J143) Rocket Motor Slow Cook-off Mitigation (Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Indian Head, MD) The FY19 effort will include integration of concept design, hardware fabrication and testing. ***FY 2019 OCO Plans:*** N/A. ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase of $.529 is due to the realignment of Conventional Ground Ammunition funding from project C3098 in FY19 and out.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	1.321	0.000	1.321

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Non Developmental Item/Commercial off the Shelf (NDI/COTS).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3774 / *Marine Corps Ammo*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3774 / *Marine Corps Ammo*

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
Ammunition Life Cycle Management	MIPR	ARDEC : Picatinny, NJ	0.000	0.000		0.000		0.803	Oct 2018	-		0.803	Continuing	Continuing	Continuing
Conventional Ground Ammunition	WR	NSWC IHEODTD : Indian Head, MD	0.000	0.000		0.000		0.468	Oct 2018	-		0.468	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		1.271		-		1.271	Continuing	Continuing	N/A

Remarks

Previously funded in Project 2086.

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
Conventional Ground Ammunition	WR	NRL : Blossom Point, MD	0.000	0.000		0.000		0.050	Oct 2018	-		0.050	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.050		-		0.050	Continuing	Continuing	N/A

Remarks

Previously funded in Project 2086.

	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		1.321		-		1.321	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3774 / *Marine Corps Ammo*

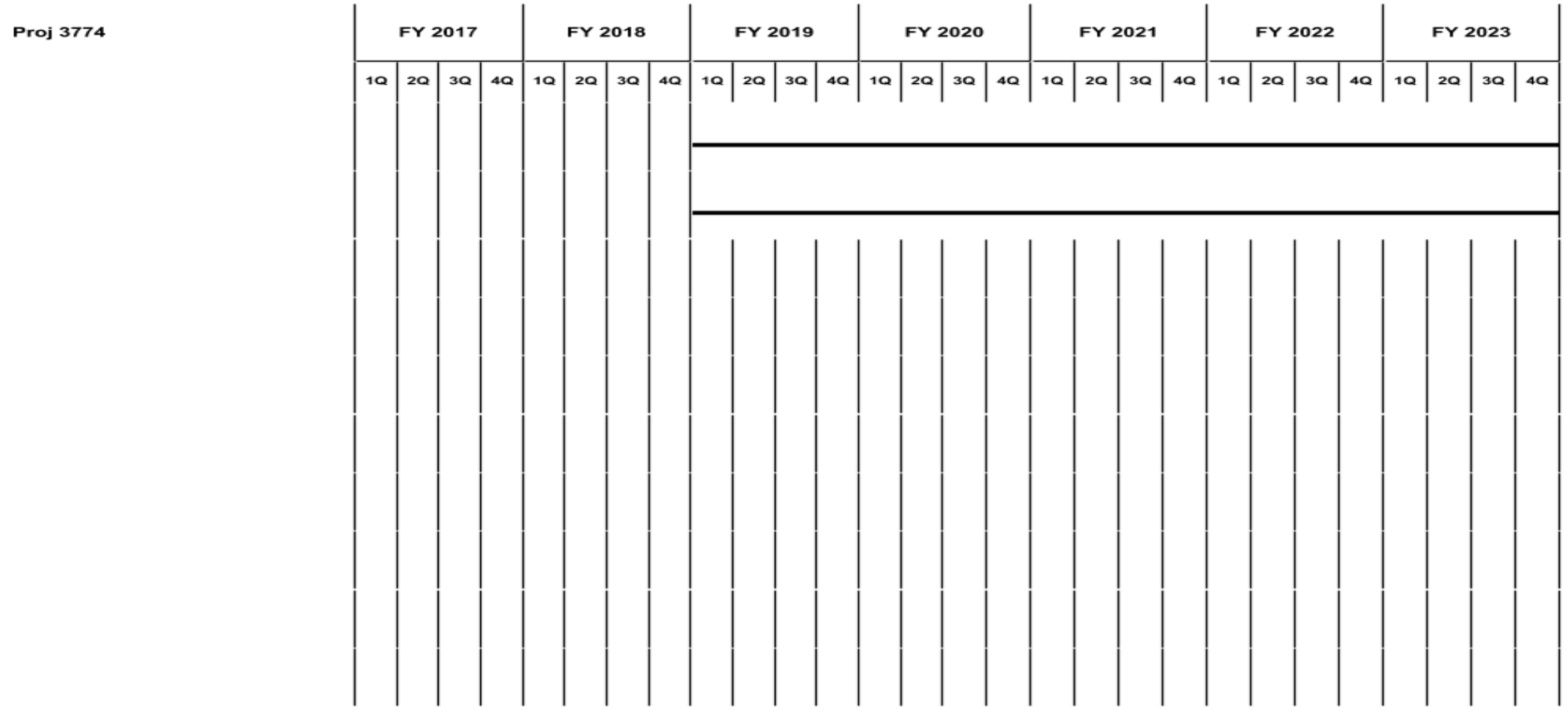


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3774 / *Marine Corps Ammo*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3774				
Ammunition Life Cycle Management - no major milestones	1	2019	4	2023
Conventional Ground Ammunition - no major milestones	1	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 3775 / *Family of Internally Transportable Vehicles (FITV)*	

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
3775: *Family of Internally Transportable Vehicles (FITV)*	0.000	0.000	0.000	0.245	-	0.245	2.180	2.183	0.235	0.240	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 19, Family of Internally Transportable Vehicles funding has been realigned from project 3098, Fire Support Systems to project 3775 Family of Internally Transportable Vehicles. Realignment of efforts to new projects in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

The Family of Internally Transportable Vehicles (FITV), including Utility Task Vehicles (UTVs) are light weight and internally transportable in the V-22, CH-53D & CH53E helos. The FITV provide deployed Marine Air-Ground Task Force (MAGTF) and Marine Expeditionary Unit (Special Operations Capable) (MEU (SOC)) with vehicles that are internally transportable in selected rotary and fixed wing aircraft. The FITV are expeditionary vehicles supporting over-the-horizon amphibious operations, irregular warfare and enhanced company operations. It is fielded to Infantry and Reconnaissance units. Speed, maneuverability, and the use of cover and concealment are the crew's primary means of survival. In FY20 the Marine Corps will establish the Internally Transportable Vehicle replacement initiative. This initiative will replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Family of Internally Transportable Vehicles	0.000	0.000	0.245	0.000	0.245
Articles:	-	-	-	-	-
FY 2018 Plans: Program reported under Project 3098					
FY 2019 Base Plans: Continue streamlined acquisitions of Commercial-Off-the-Shelf/Non-Developmental Items (COTS/NDI) that can be identified, integrated and tested in a short amount of time. FITV funding will continue modifications required to increase the FITV system readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, Service Life Extension Programs (SLEPs), or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF).					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3775 / *Family of Internally Transportable Vehicles (FITV)*

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 FY18 to FY19 is due to realignment from project 3098, Fire Support Systems. See project 3098 for FITV FY18 accomplishment detail.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	0.245	0.000	0.245

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/6545: *Family of ITV*	9.282	1.583	0.606	-	0.606	0.648	4.022	5.957	8.831	0.000	131.967

Remarks

D. Acquisition Strategy

The FITV program strategy is to explore, research and recommend efforts to address and identify solutions to reliability and safety design issues through government off-the-shelf (GOTS), commercial off-the-shelf (COTS) or modified off-the-shelf (MOTS) components. This includes the initiative to replace the current Family of Internally Transportable Vehicles (FITV) and Utility Task Vehicle (UTV).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 3775 / *Family of Internally Transportable Vehicles (FITV)*	

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
FITV Engineering Support	C/CPFF	NATC : Carson City, NV	0.000	0.000		0.000		0.245	Dec 2018	-		0.245	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.245		-		0.245	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		0.245		-		0.245	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3775 / *Family of Internally Transportable Vehicles (FITV)*

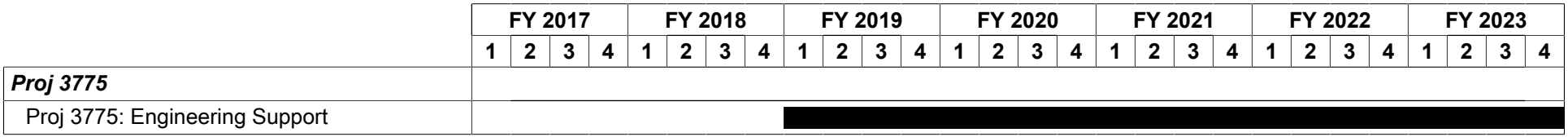


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 3775 / *Family of Internally Transportable Vehicles (FITV)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3775				
Proj 3775: Engineering Support	1	2019	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	Project (Number/Name) 4002 / *Family of Raid Reconnaissance*	

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
4002: *Family of Raid Reconnaissance*	0.646	0.431	0.548	9.590	-	9.590	1.721	1.856	18.360	22.687	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project supports multiple airborne/parachuting and specialized reconnaissance related programs focusing on immediate capability enhancements for numerous insertion and personnel equipment shortfalls currently within Marine Reconnaissance and Marine Raider units. These enhancements will improve airborne and amphibious capability, equipment and items for direct action missions, and specialized raid equipment.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Airborne Reconnaissance Equipment (ARE)	0.318	0.433	0.431	0.000	0.431
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue system / technology upgrades and evaluation of emergent and reliable solutions for challenges in support of MAGTF Joint Force and USSOCOM commanders. R&D upgrades include the Enhanced Multi Mission Parachute System (EMMPS) and system safety verification. - Continue research, development and testing on personnel parachute performance and aerial delivery fielded programs, such as parachute performance testing.					
FY 2019 Base Plans: - Continue system / technology upgrades and evaluation of emergent and reliable solutions for challenges in support of MAGTF Joint Force and USSOCOM commanders. R&D upgrades include the High-Altitude-Opening Navigation System (HAHONAV) and the Parachutist High Altitude Oxygen System. - Continue research, development testing of parachuting capabilities for accessing advantageous coordinates, including Ram-Air square parachute systems, round parachutes, automatic aviation and aerial devices, helicopter insertion/extraction equipment and joint aerial navigational systems.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 4002 / *Family of Raid Reconnaissance*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY 2019 funding request was reduced by $0.001M to account for the availability of prior year execution balances.					
Title: Amphibious Reconnaissance Capability	0.113	0.115	0.116	0.000	0.116
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue research and development of amphibious support equipment in support of MAGTF Joint Force and USSOCOM commanders to maneuver, surface or subsurface operations Specifically, the testing and evaluation of new Combatant Rubber Raiding Craft (CRRC) technology for amphibious reconnaissance capability along with the testing and evaluation efforts for life cycle replacement w/DeBatts Rubber Rigid Inflatable boat. - Initiate research and development efforts for navigation capabilities of the Diver Reconnaissance Vehicle (DRV); the replacement for the Diver Propulsion Device (DPD).					
FY 2019 Base Plans: - Continue research and development of amphibious support equipment in support of MAGTF Joint Force and USSOCOM commanders to maneuver, surface or subsurface operations. Specifically, continue research and development efforts for navigation capabilities of the Diver Reconnaissance Vehicle (DRV).					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Budget increase from FY2018 to FY2019 of $0.001M is in line with requirements and resource realignment of all commodity areas and budget adjustments made by the Marine Corps.					
Title: Aerial Delivery and Autonomous Distribution Entry	0.000	0.000	9.043	0.000	9.043
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: - Initiate research and development of block upgrades for the Air Delivery Family of Systems for steerable, extended glide systems that can deliver critical supplies when employing standoff or high altitude release for tactical advantage. Research and development will enhance the accuracy of operation in a GPS-denied					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 4002 / *Family of Raid Reconnaissance*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
environment, the interoperability with personnel, the One-Time Use Modular Autonomous Guidance Unit (MAGU), the modularity within aerial delivery systems and various other critical capabilities such as tracking, programming and battery diagnostics. - Initiate research and development of Unmanned Logistics System (ULS) - Air, specifically the integration and development of autonomy aspects for a distribution system of support for resupply and air drops. Developed capabilities will also add retrograde and unit to unit transit re-distribution not inherent with air drop alone. Release EMD contract and LRIP contract aligned to milestone B and C. Certifications include information assurance and net ready. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY2019 of $9.043M supports the development of Unmanned Logistics Systems-Air program and testing and evaluation for required hardware and software upgrades on current AAO of Joint Precision Aerial Distribution System (JPADS)					
Accomplishments/Planned Programs Subtotals	0.431	0.548	9.590	0.000	9.590

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/6518: *Amphibious Support Equipment*	7.471	5.830	5.290	-	5.290	7.136	7.217	10.094	13.969	Continuing	Continuing

Remarks

D. Acquisition Strategy

(U) Airborne Reconnaissance Equipment (ARE) acquisition strategy is to fund engineering changes and product upgrade testing and development for various reconnaissance special purpose equipment for aerial delivery and parachuting, such as the Parachutist's High Altitude Oxygen System (PHAOS); Automatic Activation Device (AAD); and the Tandem Offset Resupply Delivery System (TORDS)/Military Tandem Tethered Bundle (MTTB) System.

(U) Amphibious Reconnaissance Capability acquisition strategy is to fund engineering changes and product upgrade testing and development for various reconnaissance special purpose and lifesaving equipment for Marine Corps diving and small craft, such as the Marine Assault Breacher's Kit (MABK), Marine Individual Assault Kit (MIAK), Diver Propulsion Device (DPD), Combat Rubber Raiding Craft (CRRC) and the Diver Reconnaissance Vehicle (DRV).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 4002 / *Family of Raid Reconnaissance*

(U) Aerial Delivery and Autonomous Distribution acquisition strategy is to provide a scalable and flexible transportation (delivery, transfer and retrograde) of all classes of supply (I-IX) across the range of military operations (ROMO) for standoff/clandestine operational requirements, such as Joint Precision Air Delivery System (JPADS), conventional and precision Heavy Equipment Air Delivery System (HEADS), conventional and precision Container Delivery System (CDS), Low-Cost Container Delivery System (LCCDS), Low-Cost Cargo Parachutes (LCCP), Family of Cargo Parachutes (FoCP) and Unmanned Aircraft Systems (UAS).

E. Performance Metrics

Milestone reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 4002 / *Family of Raid Reconnaissance*

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
ARE, Various	Various	MCSC : Quantico, VA	0.014	0.000		0.000		0.015	Jun 2019	-		0.015	Continuing	Continuing	Continuing
ARE, Jumper Testing Capability	MIPR	Yuma Proving Ground : Yuma, AZ	0.182	0.000		0.000		0.150	Apr 2019	-		0.150	Continuing	Continuing	Continuing
ARC, MABK	MIPR	DLA Troop Support : Philadelphia, PA	0.090	0.037	Mar 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
ARC, RDOPTS	MIPR	DLA Troop Support : Philadelphia, PA	0.000	0.006	Mar 2017	0.000		0.000		-		0.000	0.000	0.006	-
ARC, A/M Tech Package	WR	NSWC : Carderock	0.000	0.000		0.015	Jan 2018	0.000		-		0.000	0.000	0.015	-
ARC, Battery Chargin Sys	C/FFP	MCSC : Quantico	0.000	0.000		0.030	Feb 2018	0.000		-		0.000	0.000	0.030	-
ADAA ULS-AIR	Various	NAVAIR : PAX RIVER, MD	0.000	0.000		0.000		3.608	May 2019	-		3.608	0.000	3.608	-
ADAA ULS-AIR	MIPR	US Army RDECOm : Natick, MA	0.000	0.000		0.000		2.783	May 2019	-		2.783	0.000	2.783	-
		Subtotal	0.286	0.043		0.045		6.556		-		6.556	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
ARE, Sys Eng Support	C/FFP	MCSC : Quantico, VA	0.250	0.250	Mar 2017	0.000		0.116	Mar 2019	-		0.116	Continuing	Continuing	Continuing
ADAA, Sys Eng Support	C/FFP	MCSC : Quantico, VA	0.000	0.000		0.000		0.200	Mar 2019	-		0.200	0.000	0.200	-
ADAA Sys Eng Support	Various	NAVAIR : PAX RIVER, MD	0.000	0.036	Mar 2017	0.000		0.400	Mar 2019	-		0.400	0.000	0.436	-
ADAA SYS Eng Support	MIPR	US Army RDECOM : Natick, MA	0.000	0.000		0.000		0.469	Apr 2019	-		0.469	0.000	0.469	-
		Subtotal	0.250	0.286		0.000		1.185		-		1.185	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 4002 / *Family of Raid Reconnaissance*

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
ARE, Various (travel)	Various	Various : Various	0.082	0.022	Sep 2017	0.061	Jun 2018	0.020	Sep 2019	-		0.020	Continuing	Continuing	Continuing
ARC, DeBatts Testing	WR	NSWC : Carderock	0.000	0.009	Mar 2017	0.000		0.000		-		0.000	0.000	0.009	-
ARE, PS2 FAT Dummy Drops	MIPR	YPG : Yuma	0.000	0.000		0.280	Jun 2018	0.000		-		0.000	0.000	0.280	-
ARE, EMMPS Jumper Testing	C/FFP	MCSC : Quantico	0.000	0.046	Jan 2017	0.092	Jun 2018	0.046	Jun 2019	-		0.046	0.000	0.184	-
ADAA Software Testing	MIPR	NRSDEC : Natick	0.000	0.000		0.000		0.783	Feb 2019	-		0.783	0.000	0.783	-
ARC, Various (travel)	Various	Various : Various	0.028	0.025	Aug 2017	0.035	Sep 2018	0.000		-		0.000	0.000	0.088	-
ARE, Dive Tablet	MIPR	DLA Troop Support : Philadelphia, PA	0.000	0.000		0.035	Jun 2018	0.000		-		0.000	0.000	0.035	-
ADAA, ULS-AIR	TBD	NAVAIR : PAX RIVER, MD	0.000	0.000		0.000		0.500	Aug 2019	-		0.500	0.000	0.500	-
ADAA, ULS-AIR	MIPR	US ARMY, RDECOM : Natick, MA	0.000	0.000		0.000		0.500	Aug 2019	-		0.500	0.000	0.500	-
		Subtotal	0.110	0.102		0.503		1.849		-		1.849	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	0.646	0.431		0.548		9.590		-		9.590	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 4002 / *Family of Raid Reconnaissance*

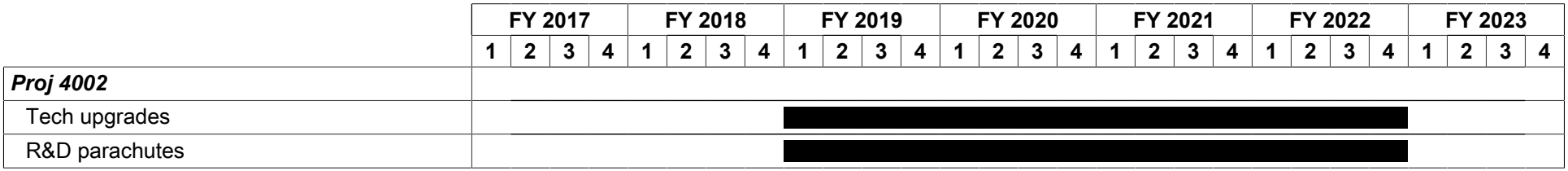


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206623M / *MC Ground Cmbt Spt Arms Sys*	**Project (Number/Name)** 4002 / *Family of Raid Reconnaissance*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4002				
Tech upgrades	1	2019	4	2022
R&D parachutes	1	2019	4	2022

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206624M *I Marine Corps Cmbt Services 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**
Total Program Element	251.356	11.639	25.258	30.156	-	30.156	40.903	13.761	14.049	14.350	Continuing	Continuing
0201: *Logistical Veh Sys Replacement (LVSR)*	37.443	0.898	0.236	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.577
2316: *Combat Service Support Eng Equip*	81.466	5.591	18.298	3.375	-	3.375	3.348	3.431	3.510	3.581	Continuing	Continuing
2509: *Motor Transport Mod*	44.804	1.295	1.213	5.267	-	5.267	5.576	1.781	1.813	1.858	Continuing	Continuing
2510: *MAGTF CSSE & SE*	29.201	2.978	3.877	6.266	-	6.266	3.938	4.025	4.104	4.193	Continuing	Continuing
2929: *Testing Measuring Diag Equip & SE*	9.636	0.561	0.577	0.647	-	0.647	0.617	0.630	0.642	0.656	Continuing	Continuing
3776: *Combat Track Vehicles Mod*	0.000	0.000	0.000	14.601	-	14.601	27.424	3.894	3.980	4.062	Continuing	Continuing
9C90: *MTVR Mod*	48.806	0.316	1.057	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.179

A. Mission Description and Budget Item Justification

This program element (PE) provides funding for Marine Air-Ground Task Force requirements for Combat Service Support equipment improvement. It will enhance combat breaching capabilities of the ground combat elements, logistics, maintenance and transportation. The PE also provides improvements in all areas of Combat Service Support Equipment Vehicles by determining the replacement for the light fleet of vehicles. This includes projects such as: Alternative Power Sources for Communications Equipment (APSCE) which is a suite of devices that provide the commander with the capability to use existing power to operate his communication equipment, computers and peripheral equipment instead of using batteries or fossil fuel generators; the Marine Corps Family of Automatic Test Systems (ATS), formerly TETS, which provides automatic testing capability for use by technicians both in garrison and forward edge of the battlefield; improvements in all areas of the M1A1 main battle tank, LVSR & MTVR; the High Performance Capabilities for Military Vehicles Project which is dedicated to applying the best practices of the motor sports industry to military vehicles including engineering expertise, equipment and technology.

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 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0206624M *I Marine Corps Cmbt Services Supt*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	13.194	25.258	26.561	-	26.561
Current President's Budget	11.639	25.258	30.156	-	30.156
Total Adjustments	-1.555	0.000	3.595	-	3.595
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.225	0.000			
• SBIR/STTR Transfer	-0.286	0.000			
• Program Adjustments	0.000	0.000	3.853	-	3.853
• Rate/Misc Adjustments	0.000	0.000	-0.258	-	-0.258
• Congressional Directed Reductions Adjustments	-1.494	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($.383) 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 $4.898M increase from FY18 to FY19 can primarily be attributed to the Intelligent Power Distribution (IPD) and Energy Storage Unit (ESU) EMD phase contract (Proj 2510) and the MTV- fuel efficiency testing, Field User Evaluation (FUE), and Service Life Extension Program (SLEP) (Proj 2509).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 0201 / *Logistical Veh Sys Replacement (LVSR)*	

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
0201: *Logistical Veh Sys Replacement (LVSR)*	37.443	0.898	0.236	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	38.577
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, LVSR funding has been realigned from project 0201, Logistical Vehicle System Replacement to project 2509, Motor Transport Mod. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

The Logistics Vehicle System Replacement (LVSR) is the USMC Marine Air-Ground Task Force (MAGTF) Heavy Lift Capability system. The Medium/Heavy Modification line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that effect vehicle reliability, availability, maintainability and readiness. A proactive and focused approach ensures proper vehicle sustainment and life cycle management, and it allows the flexibility to develop and implement improvements as needed to respond to the evolving needs of the 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
Title: Product Development	0.766	0.236	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue to support safety modification development and ECP development required to meet the diverse environments of current and future operations of MAGTF Expeditionary Maneuver Warfare as continual changes in threat environment requires an on-going and proactive approach. - Complete development and provide solution to LVSR Brake ECP issues to LVSR fleet. - Initiate development of Engineering Egress Lighting Solution. - Initiate root cause analysis for the armored cab bracket failure. OCO: - N/A					
FY 2019 Base Plans: Details provided in project 2509					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

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:*** Beginning in FY19, LVSR funding has been realigned from project 0201, Logistical Vehicle System Replacement to project 2509, Motor Transport Mod. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.					
Title: Support	0.132	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** Details provided in project 2509 ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, LVSR funding has been realigned from project 0201, Logistical Vehicle System Replacement to project 2509, Motor Transport Mod. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.					
Accomplishments/Planned Programs Subtotals	0.898	0.236	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
• PMC/5050: *Logistics Vehicle System Replacement*	1.768	11.280	3.513	0.519	4.032	3.087	3.135	2.186	2.230	Continuing	Continuing
• RDTE/C2509: *Logistics Vehicle System Replacement*	0.000	0.000	0.211	-	0.211	0.213	0.218	0.222	0.226	0.000	1.090

Remarks

BLI 5050 contains multiple programs. LVSR funding only is reflected above.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

D. Acquisition Strategy

The Logistics Vehicle System Replacement (LVSR) program used a two-phase, single-step acquisition approach rather than an evolutionary acquisition approach. Phase I developed the Cargo variant and Phase II developed the Tractor and Wrecker variants. The program is currently in sustainment utilizing RDT&E funding to address required Engineering Change Proposals (ECPs) to maintain relevancy on the battlefield and implement system requirements.
LVSR funding in FY 2019 and out realigned to project unit 2509.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 0201 / *Logistical Veh Sys Replacement (LVSR)*	

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
LVSR Safety Mod Development	SS/FFP	Various : Various	1.862	0.066	Jun 2017	0.096	Jun 2018	0.000		-		0.000	0.000	2.024	-
LVSR ECP Development	SS/FFP	Various : Various	1.419	0.635	May 2017	0.140	Jun 2018	0.000		-		0.000	0.000	2.194	-
Prior Years Cumulative Funding	C/FFP	Various : Various	17.398	0.000		0.000		0.000		-		0.000	0.000	17.398	-
		Subtotal	20.679	0.701		0.236		0.000		-		0.000	0.000	21.616	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
LVSR Engineer Change Support	SS/FFP	Various : Various	0.873	0.132	Jun 2017	0.000		0.000		-		0.000	0.000	1.005	-
Prior Years Cumulative Funding	Various	Various : Various	1.648	0.000		0.000		0.000		-		0.000	0.000	1.648	-
		Subtotal	2.521	0.132		0.000		0.000		-		0.000	0.000	2.653	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
Prior Years Cumulative Funding	Various	Various : Various	11.296	0.000		0.000		0.000		-		0.000	0.000	11.296	-
LVSR Armour Coupon Testing	Various	Not Specified : Aberdeen Test Centyer	0.000	0.065	Oct 2016	0.000		0.000		-		0.000	0.000	0.065	-
		Subtotal	11.296	0.065		0.000		0.000		-		0.000	0.000	11.361	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

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 Years Cumulative Funding	Various	Various : Various	2.947	0.000		0.000		0.000		-		0.000	0.000	2.947	-
		Subtotal	2.947	0.000		0.000		0.000		-		0.000	0.000	2.947	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	37.443	0.898		0.236		0.000		-		0.000	0.000	38.577	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

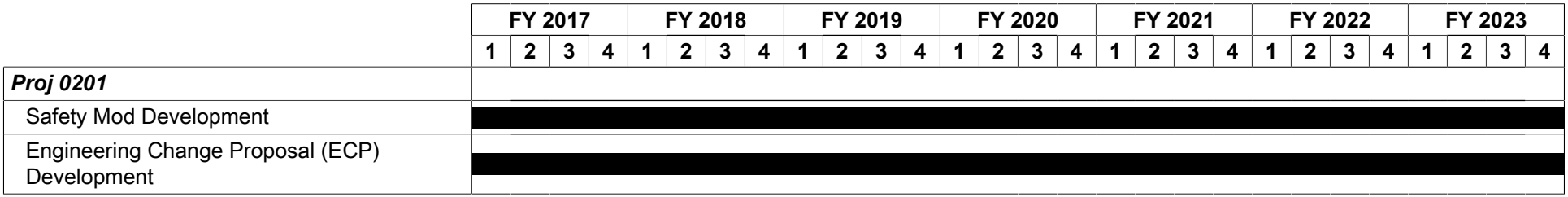


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 0201 / *Logistical Veh Sys Replacement (LVSR)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0201				
Safety Mod Development	1	2017	4	2023
Engineering Change Proposal (ECP) Development	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2316 / *Combat Service Support Eng Equip*	

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
2316: *Combat Service Support Eng Equip*	81.466	5.591	18.298	3.375	-	3.375	3.348	3.431	3.510	3.581	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

M1A1 Mod Kit: The M1A1 Mod Kit effort includes improvements in all areas of the M1A1 main battle tank and the Armored Vehicle Launched Bridge (AVLB). The M1A1 tank provides armor-protected mobile firepower to the Marine Air Ground Task Force (MAGTF). Efforts under the mod line pertaining to the M1A1 include improvements such as: lethality systems, to increase armament accuracy and provide for off-board targeting improvement; survivability systems (including passive and active); communications and command and control; mobility; increasing the crew's situational awareness through sensor enhancements and intra-vehicular data sharing; and environmental testing of components. The AVLB provides the Marine Corps only armor-protected assault gap crossing capability. Continued funding is required to address obsolescence and address operational deficiencies to adapt the tank and AVLB to a changing operational environment and support user-defined product improvements. Funding also supports items such as miscellaneous tools and test items for the M1A1 tank and associated supporting platforms, safety and sustainment modifications to the bridge launcher, and Materiel Fielding Support. M1A1 Mod Kit funding in FY 2019 and out realigned to project unit 3776.

The Engineer Mods and Tool Kits line funds modifications and initiatives which are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies and other issues that affect vehicle reliability, availability and readiness. This approach ensures proper vehicle sustainment and life cycle management in response to evolving needs of the Marine Corps fleet. Operational needs to provide personnel survivability on engineer equipment is essential to current and future operations. Research and development funding develops and integrates new lighter, compact armor technology and supports ballistic testing for applications to existing and future acquisitions.

Corrosion Prevention and Control (CPAC): The useful life of Marine Corps assets will be extended through a comprehensive CPAC RDT&E program aimed at identifying and certifying new corrosion control products, materials, processes and procedures for legacy and new acquisition. The CPAC RDT&E Program works to standardize and substantially improve strategies, objectives and processes to prevent, detect, and treat corrosion and its effects on Marine Corps ground vehicles and weapons systems. This mission responds to the Congressional directives and DoD and SECNAV instruction to reduce the negative operational effects and associated total ownership cost of Marine Corps ground vehicles and weapons systems.

Assault Bridging Modernization Program: Replaces the legacy M60 armored vehicle and launching system of the current AVLB with the chassis of an M1A1 main battle tank, configured with a modern launching system, to support the launch and recovery of assault bridging in support of MAGTF maneuver. This program will establish commonality across the DoD fleet, eliminates obsolescence and diminishing manufacturing sources and materiel shortfall issues, while increasing the operational effectiveness and readiness of the MAGTF.

The Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) provides tactical mobility for Warfighters with multi-mission vehicles designed to support urgent operational needs and protect personnel from the effects of improvised explosive devices (IEDs), underbody mines, and small arms fire threats. Multiple MRAP

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

vehicle categories (CATs) have been procured, fielded, and sustained: MRAP All Terrain Vehicle (M-ATV) - Combat Operations (ops) in rural, mountainous, urban terrain. Category I - Urban combat operations, ambulance. Category II - Multi-mission ops-convoy lead, troop transport, ambulance, utility vehicle. Category III - Mine/ IED clearance ops, explosive ordnance disposal. Operational needs to provide personnel survivability is essential to current and future operations. Research and development funding develops and integrates support efforts such as ballistic glass or other safety issues, new armor technology and ballistic testing. MRAP funding in FY 2019 and out realigned to project unit 2509.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Engineer Mods and Tool Kits	0.816	0.616	0.555	0.000	0.555
Articles:	-	-	-	-	-
FY 2018 Plans: -Initiate testing of the Engineer Change Proposals in support of the Improved Ribbon Bridge. ***FY 2019 Base Plans:*** -Continue testing of the Engineer Change Proposals in support of the Improved Ribbon Bridge. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: M1A1 Modifications	2.334	14.228	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue supporting enhancements to FEP, initiate research and development for integration design for Comm Modernization, and of components for the Ammunition Data Link (ADL) Increment II in order to support the ability to utilize next generation munitions to their full capability across the M1A1 fleet. Support upgrades to the Advanced Gunnery Training System (AGTS), specifically incorporation of the AIDATS, Tank Commander's Single Handle (TCSH), and Slew to Cue (STC). Funding increase from FY17 to FY18 of ($12.859M), ($2.859M) to support the completion of prior development projects, and ($10.000M) to conduct Non-Recurring Engineering (NRE) on the APS Technology Demonstrator design in order to make the system operationally suitable for the Marine Corps. -The USMC will refine the Active Protection System (APS) Technology Demonstrator's design with extensive Non-Recurring Engineering in FY18 and FY19 to make it more operational for the USMC. Changes includes relocating components to improve crew visibility, relocation of radar to allow reinstallation and use of smoke grenades, redesigned sponson boxes to lower launcher profile and maintain required Basic Item Issue storage,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
redesign armor for crew backblast protection and uninhibited operation of Stabilized Commander's Weapon Station (SCWS) .50-cal Machine Gun, relocation of internal turret controls and displays for better Human Factors and crew employment, and investigation of cyber issues. ***FY 2019 Base Plans:*** NA ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease is due to a realignment from PROJECT C2316 to PROJECT C3776. Realignment of effort to new PROJECT in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.					
Title: Mine Resistant Ambush Protected Family of Vehicles	0.102	0.547	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue research and development of Engineering Change Proposals (ECPs) efforts such as "material improvements" to ballistic glass or other safety issues and new armor ballistic testing in support of survivability and mobility upgrades. ***FY 2019 Base Plans:*** NA ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** MRAP funding is decreased in FY 2019 and out due to realigment to project C2509. Details located in PU 2509.					
Title: Corrosion Prevention and Control (CPAC)	2.339	2.907	2.820	0.000	2.820
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to identify new corrosion control products, materials, processes and procedures that impact Marine Corps corrosion control processes through Science and Technology initiatives in some of the following areas: Thermally Sprayed Metal Coatings (TSMC) for Corrosion Protection of Areas Subject to Wear, Compatibility					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
of Chemical Agent Resistant Coating (CARC) Systems During Re-Paint, Chip Resistant Coatings, Flexible Nonslip Coatings and Corrosion Resistant Insulating Foams. Along with stewardship of the Corrosion Products, Processes and Materials project for vendor submissions to the Marine Corps preform product qualification for chip and abrasion resistant coatings and other Corrosion Prevention Compounds that retard/arrest corrosion. The RDT&E efforts will also support field evaluations and product test in advance of fielding to determine suitability. With acceptance, update technical manuals to reflect new technologies and advanced materials. ***FY 2019 Base Plans:*** -Continue to identify new corrosion control products, materials, processes and procedures that impact Marine Corps corrosion control processes through Science and Technology initiatives in some of the following areas: Thermally Sprayed Metal Coatings (TSMC) for Corrosion Protection of Areas Subject to Wear, Compatibility of Chemical Agent Resistant Coating (CARC) Systems During Re-Paint, Chip Resistant Coatings, Flexible Nonslip Coatings and Corrosion Resistant Insulating Foams. Along with stewardship of the Corrosion Products, Processes and Materials project for vendor submissions to the Marine Corps preform product qualification for chip and abrasion resistant coatings and other Corrosion Prevention Compounds that retard/arrest corrosion. The RDT&E efforts will also support field evaluations and product test in advance of fielding to determine suitability. With acceptance, update technical manuals to reflect new technologies and advanced materials. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease of $0.087M reduces amount of Corrosion Prevention Products and Materials for testing and evaluation.					
Accomplishments/Planned Programs Subtotals	5.591	18.298	3.375	0.000	3.375

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/6670: *Items Less than $5M - CPAC & Eng Mods & Tool Kits*	6.383	7.716	11.608	-	11.608	12.480	11.517	9.914	10.161	Continuing	Continuing
• PMC/2061: *M1A1 Modification Kit*	17.530	17.778	22.904	-	22.904	23.321	38.138	45.583	57.346	0.000	959.039
• PMC/7000: *M1A1 Modification Kit*	29.717	35.640	25.804	-	25.804	33.941	34.067	40.216	47.390	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

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,N/C3776: *M1A1 Modification Kit*	0.000	0.000	14.035	-	14.035	27.150	3.534	3.614	3.683	0.000	52.016
• PMC/5050: *MRAP*	0.000	0.000	0.710	25.920	26.630	0.743	1.269	1.293	1.319	Continuing	Continuing
• PMC/6520: *EOD Systems - MRAP*	0.346	5.152	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6,301.794
• PE/LI: *Enter Other Funding Description.*	0.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Remarks

M1A1 Modification Kit: APS development efforts in FY16-20 enable the planned procurement of APS systems and supporting counter-measures in FY21-22.

EOD Systems - MRAP: BLI 6520 realigned to 5050 beginning in FY19.
MRAP RDTE realigned to 2509 beginning FY19.

D. Acquisition Strategy

(U) The M1A1 modification kits program will leverage Army initiatives to the maximum extent and incorporate modifications to adapt Army solutions to the USMC environment. The USMC will research, develop, and evaluate programs to improve the survivability and lethality of the USMC tank. These efforts include the Abrams Integrated Display and Targeting System (AIDATS), threat detection and warning, situational awareness, survivability, and ownership cost reduction work. The USMC will refine the Active Protection System (APS) technology demonstrator's design in FY18 and FY19 in preparation for live fire testing and evaluation conducted along with the Army in FY20. Procurement of APS systems and supporting counter-measures is planned in FY21 and FY22. M1A1 Mod Kit funding in FY 2019 and out realigned to project unit 3776.

(U) Engineer Mods and Tool Kits: This is a roll-up line of various engineering efforts, modifications and other related items less than $5 Million each. This program provides for significant improvements to various pieces of engineering equipment by enhancing their capabilities and improving readiness.

(U) Assault Bridging Modernization: The program will execute RDT&E in support of transportability testing activities at Aberdeen Test Center for the Assault Bridging Modernization Program.

(U) Corrosion Prevention and Control (CPAC) Program: The Program will execute the RDT&E Program to the Naval Surface Warfare Center - Carderock Division Corrosion Research and Engineering Branch, Naval Research Laboratory and the Tank and Armaments Command for a comprehensive program aimed at identifying and certifying new corrosion control products, materials, processes and procedures for legacy and new acquisition.

(U) Mine Resistant Ambush Protected (MRAP) FoV: The Program will execute RDT&E funds to research, develop, and evaluate survivability and mobility upgrades efforts such as the Cougar Egress Upgrades, Ballistic Glass and Other Safety Issues, New Armor Technology and Ballistic Testing. Work will be accomplished through

centers of excellence, such as Aberdeen Test Center, Aberdeen, MD, as well as the private sector to conduct research and analysis associated with the development of modifications and modeling and simulation efforts. MRAP funding in FY 2019 and out realigned to project unit 2509.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2316 / *Combat Service Support Eng Equip*	

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
Engineer Mod Kit	TBD	MCSC : TBD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
MRAP Modifications	WR	VARIOUS : VARIOUS	1.131	0.000		0.188	Dec 2017	0.000		-		0.000	0.000	1.319	Continuing
M1A1 Modifications - APS	MIPR	TACOM : Warren, MI	4.289	0.149	Apr 2017	8.043	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - FEP STS	SS/CPFF	Raytheon : McKinney, TX	0.000	0.335	Aug 2017	0.400	Feb 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - FEP Symbology	MIPR	DMEA : Sacramento, CA	0.563	0.000		0.000		0.000		-		0.000	0.000	0.563	-
M1A1 Modifications - Laser Upgrade	MIPR	ARDEC : Picatinny, NJ	0.000	0.000		0.384	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - Communication Mod.	MIPR	SSC LANT : Charleston, NC	0.000	0.000		0.200	May 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - TWMP	MIPR	BENET Labs : Albany, NY	0.000	0.000		0.200	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - APS / IMOD	MIPR	TACOM : Warren, MI	0.000	1.850	Apr 2017	1.214	Jan 2018	0.000		-		0.000	0.000	3.064	-
M1A1 Modifications - APS	C/CPFF	Raytheon : McKinney, TX	0.000	0.000		0.743	Mar 2018	0.000		-		0.000	0.000	0.743	-
M1A1 Modifications - GPS LP	MIPR	MCSC : Quantico, VA	2.556	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
MRAP Engineering	WR	ATC : Aberdeen, MD	2.212	0.103	Dec 2016	0.129	Dec 2017	0.000		-		0.000	0.000	2.444	Continuing
M1A1 Modifications - AGTS	MIPR	PM TRASYS : Orlando, FL	3.177	0.000		1.444	May 2018	0.000		-		0.000	Continuing	Continuing	Continuing
M1A1 Modifications - AIDATS EMD	MIPR	ABERDEEN PROVING GROUND : Aberdeen, MD	3.465	0.000		0.000		0.000		-		0.000	0.000	3.465	-
M1A1 Modifications - ADL II	MIPR	Picatinny Arsenal : Picatinny, NJ	1.174	0.000		1.600	Jan 2018	0.000		-		0.000	Continuing	Continuing	Continuing
Prior Year Cumulative. Funding	Various	VARIOUS : VARIOUS	41.469	0.000		0.000		0.000		-		0.000	0.000	41.469	-
		Subtotal	60.036	2.437		14.545		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 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2316 / *Combat Service Support Eng Equip*	

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

M1A1 Modifications - APS / IMOD: FY17/18 Payments pursuant to adding the United States Marine Corps as a principal organization involved in the Trophy Active Protection System Accelerated Characterization (TAAC) Project Agreement (PA) with the Israel Ministry Of Defense (IMOD).

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
CPAC	C/BA	TACOM : Warren, MI	0.525	0.000	Apr 2017	0.000		0.800	Dec 2018	-		0.800	0.000	1.325	-
Prior Year Cumulative Funding	Various	Various : various	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
CPAC	C/FFP	NSWC-CD : Bethseda, MD	1.448	1.025	Dec 2016	1.019	Dec 2017	1.020	Dec 2018	-		1.020	0.000	4.512	-
		Subtotal	2.273	1.025		1.019		1.820		-		1.820	0.000	6.137	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
MRAP FoV Ballistic Evaluations	MIPR	ATC : Aberdeen, MD	3.246	0.000		0.230	Dec 2017	0.000		-		0.000	0.000	3.476	Continuing
Prior Year Cumulative Funding	Various	Various : Various	2.772	0.000		0.000		0.000		-		0.000	0.000	2.772	-
Engineer Modifcation Kits	Various	Various : Various	0.000	0.614	Jun 2017	0.616	Feb 2018	0.555	Feb 2019	-		0.555	0.000	1.785	-
CPAC	C/BA	NRL : Arlington, VA	0.000	0.342	Dec 2016	0.500	Dec 2017	0.000		-		0.000	0.000	0.842	-
Engineer Modification Kits	MIPR	Aberdeen Proving Grounds : Aberdeen MD	2.302	0.200	Feb 2017	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
CPAC	WR	NSWC-CD : Bethseda, MD	10.837	0.973	Dec 2016	1.388	Dec 2017	1.000	Dec 2018	-		1.000	0.000	14.198	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2316 / *Combat Service Support Eng Equip*	

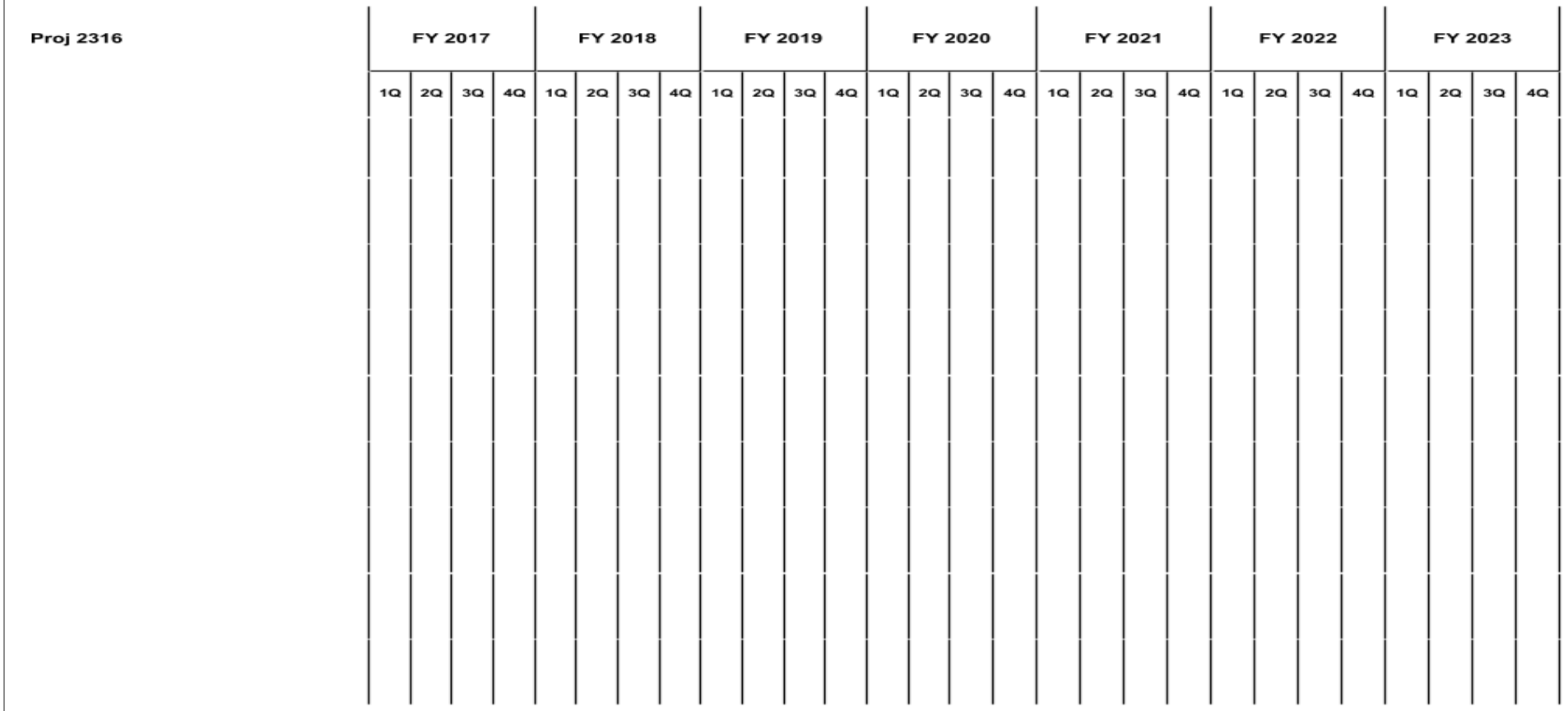
Test and Evaluation ($ in Millions)

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	19.157	2.129		2.734		1.555		-		1.555	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	81.466	5.591		18.298		3.375		-		3.375	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*



2019DON - 0206624M - 2316

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2316 / *Combat Service Support Eng Equip*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2316				
Expedited APS Schedule: MDD	1	2018	1	2018
Expedited APS Schedule: EMD	1	2018	4	2020
Expedited APS Schedule: Project Agreement	1	2018	1	2018
Expedited APS Schedule: DR	3	2018	4	2018
Expedited APS Schedule: Behicle Testing	2	2019	4	2019
Expedited APS Schedule: TRR	3	2019	3	2019
Expedited APS Schedule: SVR 1	1	2020	1	2020
Expedited APS Schedule: Live Fire	1	2020	4	2020
Expedited APS Schedule: SVR 2	1	2020	1	2023
Expedited APS Schedule: MS C	4	2020	4	2020
Expedited APS Schedule: Production and Development	1	2021	4	2022
Expedited APS Schedule: IOC	1	2022	1	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2509 / *Motor Transport 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
2509: *Motor Transport Mod*	44.804	1.295	1.213	5.267	-	5.267	5.576	1.781	1.813	1.858	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, funding for the following programs transitioned into Project 2509 in order to consolidate tactical wheeled vehicle research & development efforts into a single project unit: 0201: Logistics Vehicle System Replacement (LVSR); 9C90: MTVR Mod; 2316: Combat Service Support Eng Equip (Mine Resistant Ambush Protected (MRAP)). Funding for IRV (M88A2) HERCULES moved out of project 2509 to 3776, Combat Track Vehicles Mod.

A. Mission Description and Budget Item Justification

The Marine Corps Tactical Motor Transport Modification (MTM) project manages procurement and life cycle sustainment for more than 25,000 light fleet vehicle and tactical trailer principle end items. A sustained effort is maintained in the Marine Corps for development and testing in support of fleet Service Life Extension Program (SLEP) initiatives, vehicle quality deficiency resolutions, safety initiatives, environmental/state transportation mandated vehicle changes, and system component refresh modification efforts to include addressing deficiencies of HMMWV vehicles due to up armoring and age degradation of the fleet. Since transportation asset operational availability declines at a steady rate over time, SLEP, fleet overhauls, and enhanced depot level modifications are essential in maintaining a viable transportation capability in the Marine Corps Operating Forces.

The Improved Recovery Vehicle (M88A2) Modification program funds research, development and testing of improvements in all areas of the M88A2 vehicle, which provides the MAGTF heavy combat recovery capability. Funding addresses obsolescence and Engineering Change Proposals (ECPs) to improve performance and develop safety related ECPs to correct hazards noted during the standard day to day operation of the M88A2 IRV.

P-19 Replacement (P-19R) is replacing the obsolete A/S32P-19A Crash Fire Rescue fleet in support of expeditionary airfield operations and the supporting establishment. The vehicle is outfitted with advanced fire suppression equipment and provide rescue and aircraft fire fighting capabilities to permanent and expeditionary airfields throughout the Marine Corps. The P-19 Replacement may also be employed to fight structural fires in support of base camps and as firefighting support to other elements of the Marine Air Ground Task Force (MAGTF), such as ammunition supply points, Petroleum, Oil, and Lubricant (POL) distribution points, or hazardous material storage facilities.

The Family of Trailers & Ancillary Equipment program will explore options for "lightening the Marine Air Ground Task Force (MAGTF)" weight and cube attributes of the light and medium/heavy trailer fleet by seeking technologies and other current and emerging options that can be employed to achieve optimum lift capability while constrained to the desired weight and cube. Transportation and expeditionary goals will be considered in the research and development phase for the trailer fleet. Will develop long-term modernization plans for the medium and heavy trailers within the Marine Corps to address operating safety enhancements, mission maintainability enhancements, and crew ergonomic improvements.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

The Medium Tactical Vehicle Replacement (MTVR) Modification program line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that affect vehicle reliability, availability, maintainability, readiness, as well as energy efficiency. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management, and it allows the program office the flexibility to develop and implement improvements as needed to respond to the evolving needs of the Marine Corps. For example, the Service Life Extension Program (SLEP) effort will explore and develop strategies and products to extend the life of the MTVR to 2042. The MTVR Technology Demonstrator provides the opportunity to integrate critical upgrades which could potentially be included into the SLEP. These upgrades would include improvements in fuel consumption, long-term maintainability, and improved safety and crew survivability.

The Logistics Vehicle System Replacement (LVSR) is the USMC Marine Air-Ground Task Force (MAGTF) Heavy Lift Capability system. The Medium/Heavy Modification line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that effect vehicle reliability, availability, maintainability and readiness. A proactive and focused approach ensures proper vehicle sustainment and life cycle management, and it allows the flexibility to develop and implement improvements as needed to respond to the evolving needs of the Marine Corps.

The Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) provides tactical mobility for Warfighters with multi-mission vehicles designed to support urgent operational needs and protect personnel from the effects of improvised explosive devices (IEDs), underbody mines, and small arms fire threats. Multiple vehicle categories (CATs) have been procured, fielded, and sustained: MRAP All Terrain Vehicle (M-ATV) - Combat Operations (ops) in rural, mountainous, urban terrain. Category I - Urban combat operations, ambulance. Category II - Multi-mission ops-convoy lead, troop transport, ambulance, utility vehicle. Category III - Mine/IED clearance ops, explosive ordnance disposal. Operational needs to provide personnel survivability is essential to current and future operations. Research and development funding develops and integrates support efforts such as ballistic glass or other safety issues, new armor technology and ballistic testing.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: IRV (M88A2) HERCULES	0.321	0.352	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue the development of Artic Mobility solution set in response to Marine Forces Europe (MARFOREUR) Universal Needs Statement (UNS) addressing M88A2 ability to support Tanks in artic conditions. -Continue the development of modifications for the M88A2 and supporting equipment to increase Reliability, Availability, and Maintainability (RAM), decrease operating costs, and address obsolescence, crew ergonomics, Command and Control improvements.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

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 decrease is due to a realignment from Project 2509 to Project 3776. Realignment of effort to Project in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.					
Title: P-19 Replacement ***Articles:*** ***FY 2018 Plans:*** - Development and test activities such as reliability and snow and ice testing to satisfy mobility requirement for Marine Corps Prepositioning Program-Norway (MCPP-N). - Development of consistent Snow and Ice tire chain solution for the vehicles. - Initiate and complete tests and evaluations of the Snow and Ice tire chains to be deployed to vehicle fleet. ***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.	0.081 -	0.067 -	0.000 -	0.000 -	0.000 -
Title: Motor Transport Modification (MTM) ***Articles:*** ***FY 2018 Plans:*** Continue to evaluate, test, and integrate system modifications for the Legacy Light Tactical Vehicles to ensure effectiveness, improve vehicle safety, performance, and correct deficiencies identified for application on Motor Transportation Light Tactical assets, enabling the fleet to maintain mobility requirements. ***FY 2019 Base Plans:*** Continue to evaluate, test, and integrate system modifications for the Legacy Light Tactical Vehicles to ensure effectiveness, improve vehicle safety, performance, and correct emergent deficiencies identified for application on Motor Transportation Light Tactical assets, enabling the fleet to maintain mobility requirements. The FY18 to FY19 increase ($.059M) is due additional investment in the continuation of the Light Tactical Vehicle safety and	0.708 -	0.594 -	0.653 -	0.000 -	0.653 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
reliability efforts (such as addressing those associated with deficiencies of HMMWV vehicles due to up armoring and degradation). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Medium Tactical Vehicle Replacement (MTVR) ***Articles:*** ***Description:*** MTVR funding profile is realigned in this PE from Project 9C90 to 2509 for FY19 and future fiscal years. FY18 to FY19 Funding increase ($2.615M) supports the fuel efficiency testing & Field User Evaluation (FUE) as well as Service Life Extension Program (SLEP). ***FY 2018 Plans:*** Details provided in PE 0206624M/Project 9C90 ***FY 2019 Base Plans:*** - Continue to support the initiatives aligning with the Commandant of the Marine Corps (CMC) priority for reducing energy costs, logistics footprint, and an improved environment. - Continue Test & Evaluation efforts supporting ECP/safety mods of the MTVR as required to provide survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations. - Conduct production verification testing (PVT) on LRIP assets for FE to fully achieve fuel efficiency (FE) improvements on the MTVR. - Continue and complete Field User Evaluations (FUE), which will help determine which components and subsystems have produced the optimal fuel efficiency, using the least amount of fuel with the greatest return on investment potential. - Initiate product development efforts for the High Mobility Artillery Rocket System (HIMARS) and for the Service Life Extension Program (SLEP). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***	0.000 -	0.000 -	3.672 -	0.000 -	3.672 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Project 2509 FY18 to FY19 increase from $0.000 to $3.672M is due to MTVR funding profile being realigned in this PE from Project 9C90 to 2509 for FY19 and future fiscal years. FY18 to FY19 funding increase of $2.615M supports the fuel efficiency testing & Field User Evaluation (FUE) as well as Service Life Extension Program (SLEP).					
Title: Combat Service Support Eng Equip MRAP ***Articles:*** ***FY 2018 Plans:*** Details provided in PE 0206624M/Project 2316. ***FY 2019 Base Plans:*** Mine Resistant Ambush Protected (MRAP) Vehicles funding profile is realigned in this PE from Project 2316 to Project 2509 for FY19 and future fiscal years. Continue research and development of Engineering Change Proposals (ECPs) efforts such as "material improvements" to ballistic glass, other safety issues and new armor ballistic testing in support of survivability and mobility upgrades. Minimal decrease in funding from FY18-FY19 of $0.21M. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, funding for MRAP transitioned into Project 2509 in order to consolidate tactical wheeled vehicle research & development efforts into a single project unit.	0.000 -	0.000 -	0.526 -	0.000 -	0.526 -
Title: Family of Trailers & Ancillary Equipment ***Articles:*** ***FY 2018 Plans:*** Continue testing that ensures the effectiveness of the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle replacement (MTVR)/Logistical Vehicle System Replacement (LVSR), which enables the fleet to maintain mobility requirements. Continue Trailer Performance Test/Durability Analysis (rust/corrosion)efforts. ***FY 2019 Base Plans:***	0.185 -	0.200 -	0.205 -	0.000 -	0.205 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Will continue various testing efforts to ensure effectiveness of the Medium/Heavy Tactical Trailers designed for the Medium Tactical Vehicle replacement (MTVR)/Logistical Vehicle System Replacement (LVSR), enabling the fleet to maintain increasing mobility requirements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY18 to FY19 increase of $.005M provides for efforts such as the Trailer Performance Test/Durability Analysis (rust/corrosion) and the Ground Clearance mitigation solutions.					
Title: Logistical Veh Sytems Replacement ***Articles:*** ***FY 2018 Plans:*** Details provided in PE 0206624M/Project 0201. ***FY 2019 Base Plans:*** LVSR funding profile is realigned in this PE from Project 0201 to Project 2509 for FY19 and future fiscal years. - Complete development of Engineering Egress Lighting Solution. - Continue root cause analysis for the armored cab bracket failure. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Beginning in FY19, funding for Logistics Vehicle System Replacement (LVSR) transitioned into Project 2509 in order to consolidate tactical wheeled vehicle research & development efforts into a single project unit.	0.000 -	0.000 -	0.211 -	0.000 -	0.211 -
Accomplishments/Planned Programs Subtotals	1.295	1.213	5.267	0.000	5.267

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/5097: *Family of Tactical Trailers*	2.691	1.938	2.393	-	2.393	2.693	3.146	10.209	3.283	Continuing	Continuing
• PMC/2061-01: *M88A2 HERCULES Mod*	4.953	2.895	2.323	-	2.323	2.626	3.070	3.296	3.193	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

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/4630-01: *M88A2 HERCULES Mod*	0.164	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/5050-01: *Motor T Mod/MTVR*	6.822	6.551	7.147	18.001	25.148	14.501	8.362	8.514	8.699	Continuing	Continuing
• RDTE,N/C3776: *M88A2 HERCULES Mod*	0.000	0.000	0.359	-	0.359	0.367	0.375	0.382	0.394	0.000	1.877
• PMC/5050-02: *Motor T Mod/LVSR*	1.768	11.280	3.513	0.519	4.032	3.087	3.135	2.186	2.230	Continuing	Continuing
• RDTEN/0206624M/9C90: *MTVR Mod*	0.316	1.057	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.179
• PMC/5050-03: *Motor T Mod/MTM*	4.746	3.993	0.000	-	0.000	0.000	0.560	3.505	3.575	Continuing	Continuing
• PMC/5050-04: *Motor T Mod/MRAP*	0.000	0.000	0.710	25.920	26.630	0.743	1.269	1.293	1.319	Continuing	Continuing
• PMC/5050-05: *Motor T Mod/P19-R*	0.000	0.000	0.022	-	0.022	0.362	0.367	0.378	0.386	Continuing	Continuing
• PMC/5006: *P19-R*	73.198	32.141	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	105.339
• PMC/6520: *MRAP*	0.346	5.152	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.498
• RDTEN/0206624M/2316: *MRAP*	0.103	0.547	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.650

Remarks

Significant changes in the Other APPN/LI is the FY 2019 realignment of the following:
MRAP and P-19R PMC funding was realigned to PMC BLI 5050
LVSR, MTVR and MRAP RDTEN funding was realigned to Project Unit 2509
HERCULES RDTEN funding was realigned to Project Unit 3776

FY19 Overseas Contingency Operations (OCO) funding for MTVR, LVSR and MRAP is reflected in the BLI 5050 funding lines for each program as they have been broken out.

D. Acquisition Strategy

The IRV (M88A2) program leverages Army developmental projects to create a system that more readily meets Marine Corps Heavy Recovery Vehicle requirements. Improvements include modifications addressing safety, reliability, and technology upgrades.

The HMMWV Sustainment Modification Initiative (SMI) program was cancelled effective FY 2016. Future efforts will be focused on developing improvements to vehicle performance, safety and reliability.

The P-19 Replacement leverages COTS and NDI components in an effort to minimize costs, test requirements, and reduce development time. P-19R will supplant the aging A/S32P-19A fleet in support of expeditionary airfield operations and the supporting establishment. The vehicle will be outfitted with advanced fire suppression

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

equipment and provide rescue and aircraft fire fighting capabilities to permanent and expeditionary airfields throughout the Marine Corps. The P-19 Replacement may also be employed to fight structure fires in support of base camps and as firefighting support to other elements of the MAGTF, such as ammunition supply points, Petroleum, Oil, and Lubricants (POL) distribution points, or hazardous material storage facilities. A Firm Fixed Price (FFP) contract was awarded in May 2013 with step-ladder pricing for procurement of large quantities. The contract structure provides for production, testing, and training. A delivery order can be placed in any year, through May 2018, for production quantities up to 200 vehicles.

Motor Transport Modification (MTM) funding will focus on streamlined acquisitions of Commercial-Off-The-Shelf/Non-Developmental Items (COTS/NDI) that can be identified, integrated, and tested in a short amount of time. MTM funding will be used for modifications required to increase MTM fleet readiness, safety and reliability. Successful modifications and tests are intended for follow-on procurement and incorporation into existing system component upgrades, SLEPs, or rapid COTS/NDI fielding for the Fleet Marine Forces (FMF).

The Family of Trailers & Ancillary Equipment (FTT) management strategy will use RDT&E funding to explore current and new technological options that can be used to achieve optimum lift within the desired weight and cube constraints in support of the "Lightening the MAGTF" initiative, as well as sustaining and/or improving capabilities, such as potentially re-engineering the ground clearance on various trailers. Transportation and expeditionary goals will be considered in the research and development for the light and medium/heavy trailer fleet to include (but not limited to) the M1076 PLS (Palletized Load System) Trailer, MK1077 Flatrack, MTVR Trailer, M870 Ton Low Bed, Mk970 Tactical Refueler and the Flatrack Refueler Capability (FRC).

The strategy for the MTVR Modification initiative is to aid in the prevention of parts obsolescence, address safety concerns, and respond to emergent threats. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management and allows the program office the flexibility to develop and implement improvements as required to respond to evolving needs. The MTVR Technology Demonstrator will provide the opportunity to integrate critical upgrades which could potentially be included into the SLEP. These upgrades would include improvements in fuel consumption, long-term maintainability, and improved safety and crew survivability.

The strategy for the MTVR Fuel Efficiency (FE) initiative is to complete development activities and transition to Low-Rate Initial Production (LRIP). Limited User Evaluation testing via Governmental/Commercial facilities will be conducted on production representative items. To verify production capability and to ensure production assets are built to specifications. Field user evaluations will be conducted to verify the suitability and performance of the FE Kit.

The Logistics Vehicle System Replacement (LVSR) program used a two-phase, single-step acquisition approach rather than an evolutionary acquisition approach. Phase I developed the Cargo variant and Phase II developed the Tractor and Wrecker variants. The program is currently in sustainment utilizing RDT&E funding to address required Engineering Change Proposals (ECPs) to maintain relevancy on the battlefield and implement system requirements.

The Mine Resistant Ambush Protected (MRAP) FoV: The Program will execute RDT&E funds to research, develop, and evaluate survivability and mobility upgrades efforts such as the Cougar Egress Upgrades, Ballistic Glass and Other Safety Issues, New Armor Technology and Ballistic Testing. Work will be accomplished through centers of excellence, such as Aberdeen Test Center, Aberdeen, MD, as well as the private sector to conduct research and analysis associated with the development of modifications and modeling and simulation efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

E. Performance Metrics

Program / Technical Reviews
Fuel Efficiency MS C FY 2018 Q4
Fuel Efficiency FRP FY 2019 Q4

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

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
IRV (M88A2) HERCULES	MIPR	TACOM : Warren, MI	1.995	0.321	May 2017	0.352	Mar 2018	0.000		-		0.000	Continuing	Continuing	Continuing
P-19 APU Development	WR	NSWC : Dahlgren, VA	0.000	0.026	Jan 2017	0.000		0.000		-		0.000	0.000	0.026	-
Prior Years Cumulative Funding	Various	Various : Various	30.474	0.000		0.000		0.000		-		0.000	0.000	30.474	19.769
MTVR HIMARS Development	C/FFP	OSHKOSH : Oshkosh, WI	0.000	0.000		0.000		0.588	Dec 2018	-		0.588	Continuing	Continuing	Continuing
MRAP Modifications	WR	Various : Various	0.000	0.000		0.000		0.188	Dec 2018	-		0.188	0.000	0.188	-
MRAP Engineering	WR	ATC : ATC	0.000	0.000		0.000		0.129	Dec 2018	-		0.129	0.000	0.129	-
LVSR	MIPR	various : various	0.000	0.000		0.000		0.211	Feb 2019	-		0.211	0.000	0.211	-
MTVR SLEP Research and Development	C/FFP	TBD : TBD	0.000	0.000		0.000		1.858	Dec 2018	-		1.858	Continuing	Continuing	Continuing
		Subtotal	32.469	0.347		0.352		2.974		-		2.974	Continuing	Continuing	N/A

Remarks

MRAP realigned from project code 2316 to 2509 FY19 and out
LVSR realigned from project code 0201 to 2509 FY19 and out
MTVR realigned from project code 9C90 to 2509 FY19 and out. MTVR increase from FY18-FY19 Product Development $2.420M includes additional baseline funding for the initial High Mobility Artillery Rocket System (HIMARS) and SLEP (Service Life Extension Program) Research and 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
P19 Reliability Testing	C/BOA	NATC : Carson City, NV	0.554	0.055	May 2017	0.067	Dec 2017	0.000		-		0.000	Continuing	Continuing	Continuing
MTVR FE Testing and FUE	MIPR	ATC : Aberdeen,MD	0.000	0.000		0.000		0.226	Nov 2018	-		0.226	0.000	0.226	-
MTM (Light) Safety Testing	C/CPFF	NATC : Carson City, NV	0.000	0.295	Dec 2016	0.000		0.000		-		0.000	Continuing	Continuing	Continuing
FTT Durability Test/ Analysis	WR	NRL : Washington, DC	0.000	0.185	Nov 2016	0.200	Nov 2017	0.205	Dec 2018	-		0.205	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

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
MRAP FoV Ballistic Evaluations	MIPR	ATC : ATC	0.000	0.000		0.000		0.209	Dec 2018	-		0.209	0.000	0.209	-
MTM (Light)Testing/ Analysis	C/BA	NATC : Carson City, NV	0.000	0.413	Aug 2017	0.594	Dec 2017	0.653	Dec 2018	-		0.653	Continuing	Continuing	Continuing
MTVR ECP Test & Evaluation	Various	Various : Various	0.000	0.000		0.000		0.600	Dec 2018	-		0.600	0.000	0.600	-
MTVR ATC Testing	MIPR	ATC : Aberdeen, MD	0.000	0.000		0.000		0.400	Nov 2018	-		0.400	0.000	0.400	-
Prior Years Cumulative Funding	Various	Various : Various	10.995	0.000		0.000		0.000		-		0.000	0.000	10.995	-
		Subtotal	11.549	0.948		0.861		2.293		-		2.293	Continuing	Continuing	N/A

Remarks

MTVR increase from $0.760M in FY18 to $1.226M in FY19 is due to test and evaluation of the FE system.
MTM (Light) testing/analysis increase of $0.059 in FY19 will support testing of improvements related to safety and reliability of Light Tactical Vehicles for quality deficiency resolutions, safety initiatives, and system component refresh modification efforts.

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
HMMWV Program Management	Various	Various : Various	0.786	0.000		0.000		0.000		-		0.000	0.000	0.786	-
		Subtotal	0.786	0.000		0.000		0.000		-		0.000	0.000	0.786	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	44.804	1.295		1.213		5.267		-		5.267	Continuing	Continuing	N/A

Remarks

Cumulative increase from FY18 and FY19 is $4.205M, a result of additional programs aligned to Proj 2509 beginning in FY19.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

MTVR Schedule

As of 12 July 2017

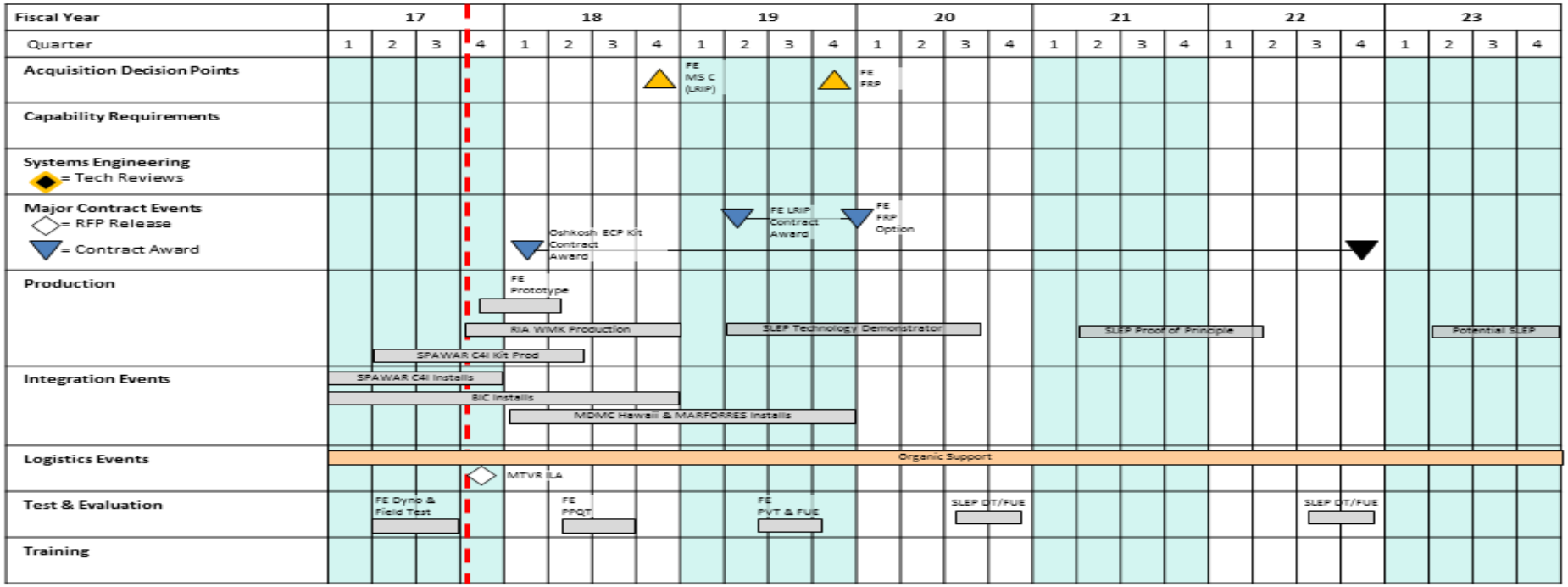


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2509 / *Motor Transport Mod*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
MTVR				
Fuel Efficient Modifications	1	2019	4	2023
Safety Mod Development	1	2019	4	2023
ECP/HIMARS Development	1	2019	4	2023
SLEP Tech Demonstrator	2	2019	3	2020
FE LRIP	1	2019	1	2020
FE Solution Production	1	2020	2	2023
FE MS C	4	2018	4	2018
FE FRP	4	2019	4	2019
FE FUE	2	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2510 / *MAGTF CSSE & SE*	

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
2510: *MAGTF CSSE & SE*	29.201	2.978	3.877	6.266	-	6.266	3.938	4.025	4.104	4.193	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Environmental Control Equipment, Mobile Power Equipment and Advanced Power Sources are a part of Expeditionary Energy Initiatives.

A. Mission Description and Budget Item Justification

Environmental Control Equipment:
The Family of Environmental Control Equipment consists of Environmental Control Units, Field Refrigeration Systems, Integrated Trailer ECU and Generator Systems, and Cooling and Refrigeration Expeditionary Tool Kits. These systems provide required heating, cooling, storage, and servicing for systems throughout the Marine Corps. Current efforts seek to replace all legacy ECUs with systems of higher reliability and higher efficiency using EPA-approved refrigerants, more energy efficient enhanced mobility, easier to repair, and quieter than their predecessors. With environmental control systems consuming 50-70% of tactical electric power in theater, this savings will be a significant contribution to reducing the USMC fuel demand, and lightening the Marine Air-Ground Task Force (MAGTF). The Warfighter benefit includes a decreased logistics footprint, less reliance on petroleum-derived fuels, increased local energy security, and reduced tanker losses (fewer on the road). The operational imperative to reduce fuel usage will consequently reduce refueling operations and exposing Marines to hazardous fuel convoy operations.
Efforts such as research, development, integration testing of
(1) Field Refrigeration Systems (FRS) Refrigerant Unit (RU) replacement. This effort seeks to replace legacy RUs in current USMC Large and Small FRSs complying with EPA regulations while increasing efficiency thus reducing overall power requirements/demands.
(2) The Enhanced Environmental Control Unit (E2CU) program is the second generation of a family of environmental control units from 9,000 BTU to 60,000 BTU/Hr cooling output. The E2CU program will provide tactical Heating, Ventilation and Air Conditioning (HVAC) and superior reliability for all MAGTF units in all operational concepts. E2CU will have significant average fuel efficiency improvements over the current ECU family. This has been demonstrated while complying with newer EPA regulations on refrigerants.

Mobile Power Equipment:
The Family of Mobile Electric Power Equipment consists of command and control systems for power management and distribution (intelligent power management), tactical generators ranging from 2 to 100 kilowatts, power distribution systems, energy storage systems, load banks, floodlights, cabling, and electrician tool kits.
This equipment is to procure, field, manage and provide electricity on the battlefield. Systems may be mounted on prime movers, skids or trailers. Systems support maneuver, combat support, and combat service support units requiring tactical power to operate weapons systems, Command, Control, Communications, Computers and Intelligence (C4I) systems, medical and messing facilities, environmental control equipment, and water purification systems. With over 10,000 generators and using diesel engines in the Operating Forces, improving their fuel efficiency and reliability will be a significant contribution to reducing the USMC fuel demand, and lightening the MAGTF. The Warfighter benefit includes a decreased logistics footprint, less reliance on petroleum derived fuels, increased local energy security, and reduced

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

tanker losses (fewer on the road). The operational imperative to reduce fuel usage will consequently reduce refueling operations and exposing Marines to hazardous fuel convoy operations.

Efforts encompass research, development, integration, and testing of the following items:
(1) Intelligent Power Management Systems (IPMS) which support a robust, scalable solution to interconnect, control, store and distribute power from various sources. As a result, the power requirements will be met in a more efficient manner thus reducing fuel consumption. The IPMS will use multiple electrical inputs from military generators, vehicles and renewable sources. Subsystems include Advanced Digital Control System (ADCS), Energy Storage Unit (ESU), and Intelligent Power Distribution System (IPD).
(2) Large Advanced Power Sources (LAMPS) procurement of newer more fuel efficient large format generators (100-200kw) replacing the legacy generators and ensuring commonality with the Army large format generators.

Advanced Power Sources:
The Advanced Power Sources (APS) efforts will focus on achieving the Marine Corps goal of lightening the Marine Air Ground Task Force (MAGTF) through reduced logistical fuel resupply needs. The Mobile Electric Hybrid Power Source (MEHPS) Capability Development Document (CDD) addresses the USMC Expeditionary Water and Waste (E2W2) Initial Capabilities Document (ICD) and supports the MAGTF intent to: travel lighter and faster, use less fuel, depend less on the supply chain; and reduce energy production, storage, and distribution requirements. This CDD addresses the Operational Energy (OE) ICD identifying the power and energy criticalities to the Joint Force. The Mobile Electric Hybrid Power System (MEHPS) will focus on hybrid power systems capable of improved fuel efficiency and silent operations in the 0.5-5kW and 10-15kW power range. These systems will be smaller, lighter and more efficient systems that reduce the demand for fossil fuels, extending the Commander's operational reach. These efforts will transition into production of systems that integrate with the Tactical Quiet Generator (TQG), Advanced Medium Mobile Power Sources (AMMPS), and future generator sets. The Battery Maintenance and Storage Shelter effort will focus on developing a modular solution to store and maintain a variety of battery form factors and chemistries. This will provide an environmentally protected, deployable battery maintenance and storage shelter with the capability to maintain and condition deployable batteries that will significantly decrease O&M costs to the Fleet by extending the life of fielded batteries.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Environmental Control Equipment	0.262	0.507	0.518	0.000	0.518
Articles:	-	-	-	-	-
FY 2018 Plans: -Design for the Enhanced Environmental Control Units to increase energy efficiency via cooling environmental control units and adapt to changes in Environmental Protection Agency (EPA) regulations of refrigerants.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Continue design for the Enhanced Environmental Control Units to increase energy efficiency via cooling environmental control units. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: Mobile Power Equip/Hybrid Generator/Next Gen Power Distribution System ***Articles:*** ***FY 2018 Plans:*** -Initiate 3rd Quarter FY18 Milestone B efforts for intelligent Power Distribution (IPD) and Energy Storage Unit (ESU). ***FY 2019 Base Plans:*** - Initiate Intelligent Power Distribution (IPD) and Energy Storage Unit (ESU) EMD phase. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY18 to FY19 funding increased by $1.726M due to the Intelligent Power Distribution (IPD) and Energy Storage Unit (ESU) EMD phase contract.	1.284 -	1.274 -	3.000 -	0.000 -	3.000 -
Title: Advanced Power Sources ***Articles:*** ***FY 2018 Plans:*** MOBILE ELECTRIC HYBRID POWER SOURCES (MEHPS) -Initiate Mobile Electric Hybrid Power Sources (MEHPS) Field User Evaluation (FUE) to define system requirements and assess military utility, usability, human factors and system capabilities; certifying large format lithium batteries for MEHPS. ***FY 2019 Base Plans:*** MOBILE ELECTRIC HYBRID POWER SOURCES (MEHPS)	1.432 6	2.096 -	2.748 -	0.000 -	2.748 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Initiate Product Verification Testing (PVT) ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY18 to FY19 funding increased by $0.652M due to the shifting of Product Verification Testing (PVT) from FY18 to FY19.					
Accomplishments/Planned Programs Subtotals	2.978	3.877	6.266	0.000	6.266

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/6054: *Environmental Control Equipment*	0.000	1.405	0.496	-	0.496	0.495	0.496	3.368	3.431	0.000	95.674
• PMC/6366-1: *Mobile Power Equipment*	3.413	6.694	9.744	-	9.744	14.575	8.653	8.839	10.025	Continuing	Continuing
• PMC/6366-2: *Advanced Power Sources*	15.693	3.216	11.615	-	11.615	13.283	15.778	16.092	16.431	Continuing	Continuing

Remarks

D. Acquisition Strategy

Environmental Control Units: Initial focus on development of more efficient 36,000 BTU/Hr and 60,000 BTU/Hr size model Environmental Control Units (ECUs), since they make up the greatest percentage of the inventory and are used extensively for shelter heating and cooling. Full and open competition. Three contractors to develop and deliver prototypes in two size models. Government testing to validate performance. Single contractor to produce both models using multi-year ID/IQ production contract. Low Rate Initial Production (LRIP), followed by LRIP testing, then Full Rate Production (FRP) to procure using PMC funds on annual Delivery Orders. ECUs are organically supported by Marines.

Mobile Power Sources: Focus on development of Micro-Grid Storage/Intelligent Power Management (IPM). Acquisition Strategy is for Full and Open competition. Government testing to validate performance on prototypes followed by Full Rate Production (FRP) to procure on multiple Delivery Orders.

Advanced Power Sources: The acquisition strategy is to focus on development of the Mobile Electric Hybrid Power System (MEHPS). This R&D effort will focus on achieving the Marine Corps goal of lightening the MAGTF through reduced logistical fuel resupply needs, extending the Commander's operational reach. The

development will focus on making these systems smaller, lighter and more efficient. The MEHPS program will purchase 8 medium and 8 light systems from two vendors through competitively awarded EMD contracts. The MEHPS systems will undergo rigorous electrical, environmental, safety, and performance testing to ensure they are robust and meet user requirements. Information learned in the EMD phase will help define the performance specification that will be used to award a full and open production contract.

E. Performance Metrics

E2CU: Energy efficiency; size; weight; EPA-approved refrigerant; affordability; organically supportable.
MOBILE POWER: Energy efficiency; size; weight; affordability; organically supportable.
MEHPS: 55% savings in fuel and 80% reduction in generator runtime versus a standard 10 Kilowatt (kW) Tactical Quiet Generator (TQG).
BMASS: Energy efficiency; size; weight; ability to charge specified batteries.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

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
MPS Micro Grid Storage/ IPM	C/FFP	AFLCMC : HANSCOM AFB	0.636	0.934	Jan 2017	1.274	Mar 2018	0.000		-		0.000	0.000	2.844	-
MPS Micro Grid Design Tool	MIPR	Sandia Labs : ALBU, NM	0.810	0.000		0.000		0.000		-		0.000	0.000	0.810	-
APS MHEES/MEHPS Testing	WR	NSWC : CARDEROCK, MD	1.250	0.732	Feb 2017	0.000		2.748	Jan 2019	-		2.748	0.000	4.730	-
MPS AUTODISE DEVELOPMENT	MIPR	NIGHT VISION : FT BELVOIR	0.525	0.000		0.000		0.000		-		0.000	0.000	0.525	-
APS MEHPS EMD	C/FFP	UEC : CHARLESTON, SC	2.591	0.000		0.000		0.000		-		0.000	0.000	2.591	-
APS Battery Storage and Maint Shelter	TBD	TBD : TBD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
E2CU DEVELOPMENT	C/FFP	VAR : VAR	0.191	0.000		0.507	Feb 2018	0.000		-		0.000	0.000	0.698	-
APS Power Assesment	MIPR	AFLCMC : HANSCOM AFB	0.125	0.000		0.000		0.000		-		0.000	0.000	0.125	-
MPE IPD ESU EMD	C/FFP	TBD : TBD	0.000	0.000		0.000		3.000	Nov 2018	-		3.000	0.000	3.000	-
APS MEHPS EMD	C/FFP	DRS : CONNECTICUT	2.198	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	VAR : VAR	11.122	0.000		0.000		0.000		-		0.000	0.000	11.122	-
		Subtotal	19.448	1.666		1.781		5.748		-		5.748	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	VAR : VAR	0.059	0.000		0.000		0.000		-		0.000	0.000	0.059	-
		Subtotal	0.059	0.000		0.000		0.000		-		0.000	0.000	0.059	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2510 / *MAGTF CSSE & SE*	

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
APS MEHPS Testing (DT)	MIPR	ABERDEEN TEST CENTER : ABERDEEN, MD	0.000	0.700	Mar 2017	0.000		0.000		-		0.000	0.000	0.700	-
ECE SFRS EVALUATION	MIPR	ABERDEEN TEST CENTER : ABERDEEN MD	0.000	0.262	Feb 2017	0.000		0.518	Feb 2019	-		0.518	0.000	0.780	-
APS MEHPS Field User Evaluation	TBD	TBD : TBD	0.000	0.000		0.600	Jan 2018	0.000		-		0.000	0.000	0.600	-
Prior Year Cumulative Funding	Various	Various : Various	6.029	0.000		0.000		0.000		-		0.000	0.000	6.029	-
APS MEHPS Lithium Battery Testing	WR	NSWC : CARDERROCK, MD	0.000	0.000		0.500	Jan 2018	0.000		-		0.000	0.000	0.500	-
MPE MICRO GRID TESTING	MIPR	ABERDEEN TEST CENTER : ABERDEEN MD	1.051	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
AMMPS ADCS EVALUATION	WR	NSWC CADEROCK : CARDEROCK MD	0.189	0.350	Jan 2017	0.000		0.000		-		0.000	0.000	0.539	-
APS MEHPS Environmental Testing	MIPR	ABERDEEN TEST CENTER : ABERDEEN, MD	0.000	0.000		0.996	Feb 2018	0.000		-		0.000	0.000	0.996	-
		Subtotal	7.269	1.312		2.096		0.518		-		0.518	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
MPE PM support for development and test mgmt	C/FFP	MCSC : Quantico, VA	2.425	0.000		0.000		0.000		-		0.000	0.000	2.425	-
		Subtotal	2.425	0.000		0.000		0.000		-		0.000	0.000	2.425	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2510 / *MAGTF CSSE & SE*	

	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	29.201	2.978		3.877		6.266		-		6.266	Continuing	Continuing	N/A

Remarks

Environmental Control Equipment, Mobile Power Equipment and Advanced Power Sources are part of Expeditionary Energy Initiatives.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

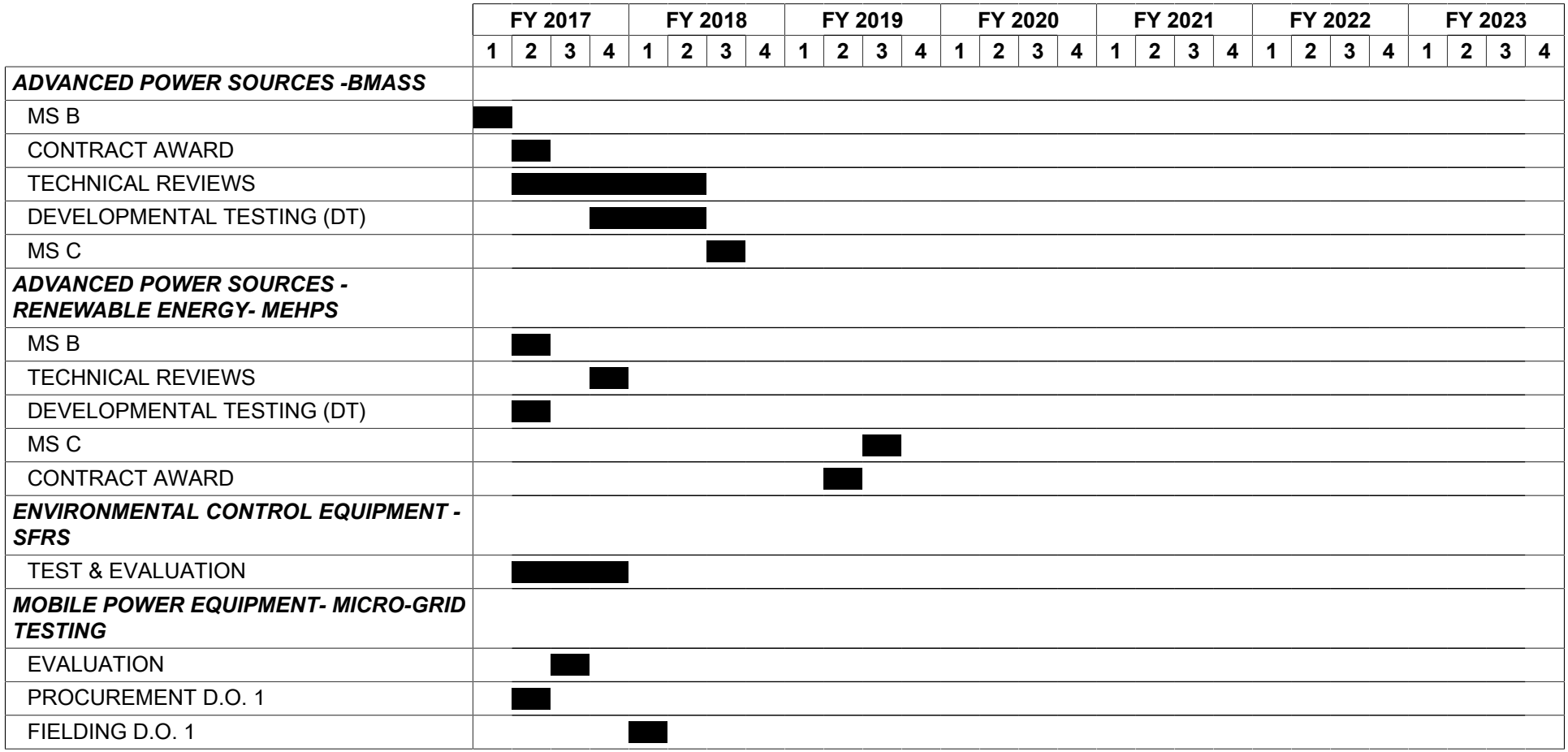


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2510 / *MAGTF CSSE & SE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
ADVANCED POWER SOURCES -BMASS				
MS B	1	2017	1	2017
CONTRACT AWARD	2	2017	2	2017
TECHNICAL REVIEWS	2	2017	2	2018
DEVELOPMENTAL TESTING (DT)	4	2017	2	2018
MS C	3	2018	3	2018
ADVANCED POWER SOURCES -RENEWABLE ENERGY- MEHPS				
MS B	2	2017	2	2017
TECHNICAL REVIEWS	4	2017	4	2017
DEVELOPMENTAL TESTING (DT)	2	2017	2	2017
MS C	3	2019	3	2019
CONTRACT AWARD	2	2019	2	2019
ENVIRONMENTAL CONTROL EQUIPMENT - SFRS				
TEST & EVALUATION	2	2017	4	2017
MOBILE POWER EQUIPMENT- MICRO-GRID TESTING				
EVALUATION	3	2017	3	2017
PROCUREMENT D.O. 1	2	2017	2	2017
FIELDING D.O. 1	1	2018	1	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2929 / *Testing Measuring Diag Equip & SE*	

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
2929: *Testing Measuring Diag Equip & SE*	9.636	0.561	0.577	0.647	-	0.647	0.617	0.630	0.642	0.656	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Marine Corps Family of Automatic Test Systems (ATS), provides automatic test program capability for use by technicians both in garrison and the forward edge of the battlefield; specifically in the areas of interactive electronic technical manuals, condition/predictive based maintenance, and embedded sensors and prognostics.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Automatic Test Systems (ATS)	0.561	0.577	0.647	0.000	0.647
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue to develop new advanced technology concepts for automatic test and integrate the subsystems and components into fielded automatic test solutions to support weapon systems.					
FY 2019 Base Plans: -Continue to develop new advanced technology concepts for automatic test and integrate the subsystems and components into fielded automatic test solutions to support weapon systems.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The $70K increase from FY18 to FY19 will support labor to integrate a more capable radio frequency subsystem into a General Purpose Automatic Test System.					
Accomplishments/Planned Programs Subtotals	0.561	0.577	0.647	0.000	0.647

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/4181: *Automatic Test Systems (ATS)*	7.276	24.704	9.958	-	9.958	9.122	5.039	5.138	5.346	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2929 / *Testing Measuring Diag Equip & SE*

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

Automatic Test Systems (ATS) acquisition is being done through U.S. Army Armament Research, Development & Engineering Center (ARDEC), Picatinny, NJ both in-house and contracts; In-house at Marine Corps Logistics Command (MCLC), Albany, GA; In-house at Naval Surface Warfare Center, Crane, and through Marine Corps Systems Command contracts.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 2929 / *Testing Measuring Diag Equip & SE*	

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
ATS Tech Eval & HW Digital Test	WR	MCLC Albany : Albany, GA	0.215	0.561	Feb 2017	0.577	Feb 2018	0.647	Feb 2019	-		0.647	Continuing	Continuing	Continuing
Prior Years Cumulative Funding	Various	N/A : N/A	5.443	0.000		0.000		0.000		-		0.000	0.000	5.443	-
		Subtotal	5.658	0.561		0.577		0.647		-		0.647	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
Prior Years Cumulative Funding	Various	N/A : N/A	3.978	0.000		0.000		0.000		-		0.000	0.000	3.978	-
		Subtotal	3.978	0.000		0.000		0.000		-		0.000	0.000	3.978	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	9.636	0.561		0.577		0.647		-		0.647	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2929 / *Testing Measuring Diag Equip & SE*

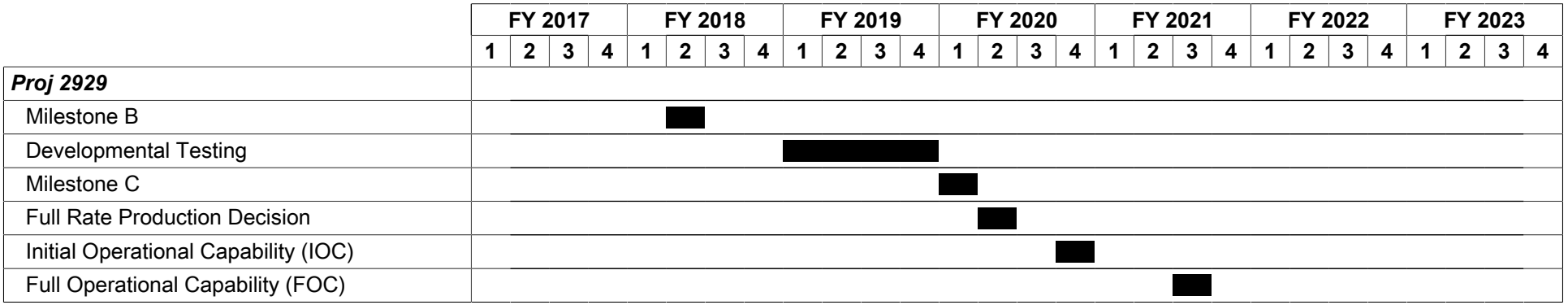


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 2929 / *Testing Measuring Diag Equip & SE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2929				
Milestone B	2	2018	2	2018
Developmental Testing	1	2019	4	2019
Milestone C	1	2020	1	2020
Full Rate Production Decision	2	2020	2	2020
Initial Operational Capability (IOC)	4	2020	4	2020
Full Operational Capability (FOC)	3	2021	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 3776 / *Combat Track Vehicles 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
3776: *Combat Track Vehicles Mod*	0.000	0.000	0.000	14.601	-	14.601	27.424	3.894	3.980	4.062	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, M1A1 funding has been realigned from project 2316, Combat Service Support Eng Equip and project 2509, Motor Transport Mod to project 3776, Combat Track Vehicles Mod. Realignment of efforts to new projects in FY19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

The Combat Track Vehicles Mod effort provides armor-protected mobile firepower to include improvements in all areas of the M1A1 main battle tank, Improved Recovery Vehicle (IRV), and Armored Vehicle Launched Bridge (AVLB). Efforts under the Mod line pertaining to the M1A1 include improvements such as: lethality systems, to increase armament accuracy and provide for off-board targeting improvements; survivability systems (including active and passive); communications and command and control; and mobility, increasing the crew's situational awareness through sensor enhancements and intra-vehicular data sharing; and environmental testing of components. The IRV (also known as the M88A2) provides heavy armor-protected recovery capability to the MAGTF. The Mod line funds research, development, and testing of improvements in all areas of the IRV. This funding addresses obsolescence and Engineering Change Proposals (ECPs) to improve the performance and develop safety related ECPs to correct hazards noted during the day to day operation of the M88A2 IRV.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: M1A1 Modifications	0.000	0.000	14.242	0.000	14.242
Articles:	-	-	-	-	-
FY 2018 Plans: FY18 and prior are captured under Project Code 2509 & 2316					
FY 2019 Base Plans: - Continue supporting modifications to include the Firepower Enhancement Program (FEP)improvements, integration solutions and test items for Tactical Comm Modernization, components for the Ammunition Data Link (ADL) Increment II in order to support the ability to utilize next generation munitions to their full capability across the M1A1 fleet, and Non-Recurring Engineering (NRE) on the Active Protective System (APS) Technology Demonstrator to complete redesign and development of the system for operational suitability on the Tanks.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*

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 increase is due to a realignment from project 2316, Combat Support Eng Equipment to project 3776, Combat Track Vehicles Mod.					
Title: IRV (M88A2) Modifications	0.000	0.000	0.359	0.000	0.359
Articles:	-	-	-	-	-
FY 2018 Plans: FY18 and prior are captured under Project Code 2509 & 2316 ***FY 2019 Base Plans:*** - Continue the development of modifications for the M88A2, such as Artic Mobility and Exhaust redesign, in addition to supporting equipment to increase Reliability, Availability, and Maintainability (RAM), decrease operating costs, and address obsolescence, crew ergonomics, Command and Control improvements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY 2019 increase is due to the realignment of funding from project 2509, Motor Transport Mod to project 3776, Combat Track Vehicles Mod.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	14.601	0.000	14.601

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/2061: *M1A1 Modification Kit*	17.530	17.778	22.904	-	22.904	23.321	38.138	45.748	57.346	0.000	959.204
• PMC/7000: *M1A1 Modification Kit*	29.717	35.640	25.804	-	25.804	33.941	34.067	40.216	47.390	Continuing	Continuing
• RDTE,N/C2316: *M1A1 Modification Kit*	2.334	14.228	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.562
• RDTE,N/C2509: *M88A2 HERCULES Mod*	0.321	0.352	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.673

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*

D. Acquisition Strategy

(U) The M1A1 modification kits program will leverage Army initiatives to the maximum extent and incorporate modifications to adapt Army solutions to the USMC environment. The USMC will research, develop, and evaluate programs to improve the survivability, lethality, command and control, and mobility of the USMC tank. These efforts include ADL II, Advance Gunnery Target System (AGTS), Track Width Mine Plow (TWMP), Active Protection System (APS), and Tactical Comm Modernization. The USMC will refine the Active Protection System (APS) technology demonstrator's design in FY18 and FY19 in preparation for live fire testing and evaluation conducted along with the Army in FY20. Procurement of APS systems and supporting counter-measures is planned in FY21 to FY23. Testing and integration of the Tactical Comm Modernization will occur FY18-19, with procurement commencing late FY19.

The IRV program leverages Army developmental projects to create a system that more readily meets Marine Corps Heavy Recovery Vehicle requirements. Improvements include modifications addressing safety that include artic mobility and exhaust redesign, reliability, and technology upgrades.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*	

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
M1A1 Mod - APS B-Kit	C/FFP	TACOM : Warren, MI	0.000	0.000		0.000		3.191	Jan 2019	-		3.191	0.000	3.191	-
M1A1 Mod - APS A-Kit	C/CPFF	TACOM : Warren, MI	0.000	0.000		0.000		3.500	Jan 2019	-		3.500	Continuing	Continuing	Continuing
M1A1 Mod - APS / IMOD	MIPR	TACOM : Warren, MI	0.000	0.000		0.000		3.100	Feb 2019	-		3.100	Continuing	Continuing	Continuing
M1A1 Mod - APS Test Spt	MIPR	TACOM : Warren, MI	0.000	0.000		0.000		2.200	Jan 2019	-		2.200	Continuing	Continuing	Continuing
M1A1 Mod - APS Eng Spt	C/CPFF	TACOM : Warren, MI	0.000	0.000		0.000		1.100	Mar 2019	-		1.100	Continuing	Continuing	Continuing
M1A1 Mod - Electro-Optinc Spt	MIPR	NVESD : Ft. Belvoir, VA	0.000	0.000		0.000		0.265	Nov 2018	-		0.265	0.000	0.265	-
M1A1 Mod - TCM	WR	SSC-LANT : Charleston, NC	0.000	0.000		0.000		0.125	Jul 2019	-		0.125	0.000	0.125	-
M1A1 Mod - AGTS	MIPR	PM TRASYS : Orlando, FL	0.000	0.000		0.000		0.361	Jul 2019	-		0.361	0.000	0.361	-
M1A1 Mod - ADL II	MIPR	ARDEC : Picatinny, NJ	0.000	0.000		0.000		0.250	Jul 2019	-		0.250	0.000	0.250	-
M1A1 Mod - FEP STS	C/FFP	Raytheon : McKinney, TX	0.000	0.000		0.000		0.100	Jul 2019	-		0.100	0.000	0.100	-
M1A1 Mod - TWMP	MIPR	TBD : TBD	0.000	0.000		0.000		0.050	Jul 2019	-		0.050	0.000	0.050	-
M88A2 HERCULES	MIPR	TACOM : Warren, MI	0.000	0.000		0.000		0.359	Mar 2019	-		0.359	0.000	0.359	-
		Subtotal	0.000	0.000		0.000		14.601		-		14.601	Continuing	Continuing	N/A

Remarks

Due to APS prioritization and ongoing cost increases, all non APS efforts have been reduced and will be incrementally funded during fourth quarter of FY19. Additionally, TCM decreased significantly as PFM CES will be qualifying the new radios reducing its cost.

	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		14.601		-		14.601	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*

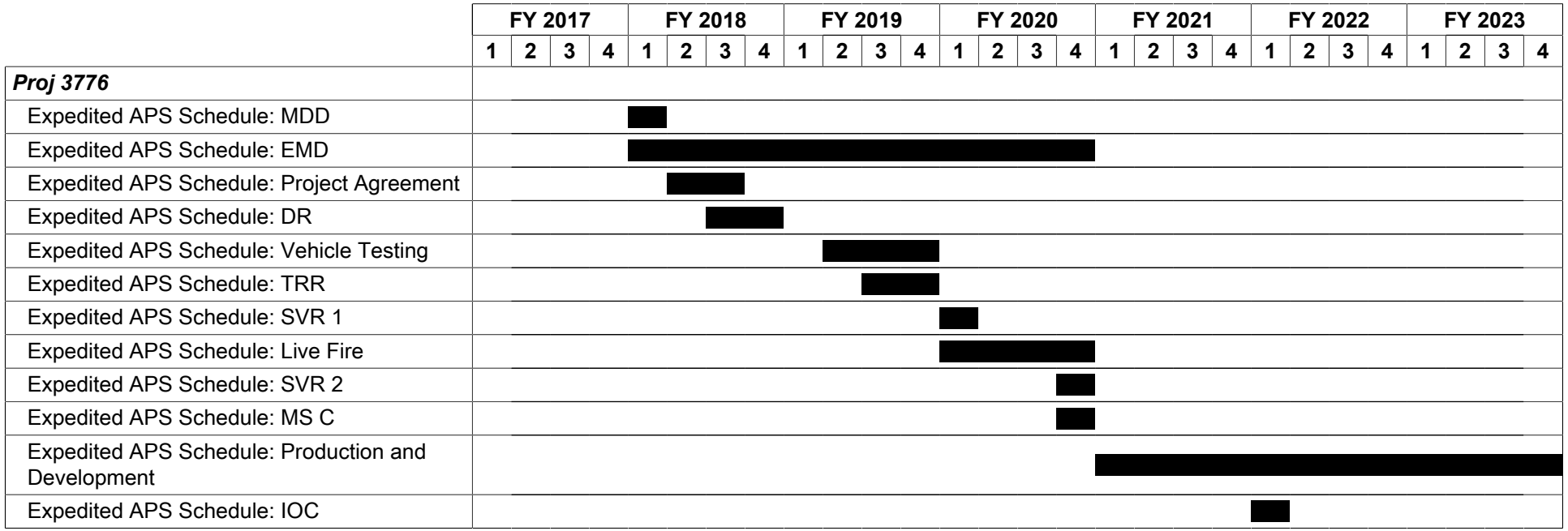


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 3776 / *Combat Track Vehicles Mod*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3776				
Expedited APS Schedule: MDD	1	2018	1	2018
Expedited APS Schedule: EMD	1	2018	4	2020
Expedited APS Schedule: Project Agreement	2	2018	3	2018
Expedited APS Schedule: DR	3	2018	4	2018
Expedited APS Schedule: Vehicle Testing	2	2019	4	2019
Expedited APS Schedule: TRR	3	2019	4	2019
Expedited APS Schedule: SVR 1	1	2020	1	2020
Expedited APS Schedule: Live Fire	1	2020	4	2020
Expedited APS Schedule: SVR 2	4	2020	4	2020
Expedited APS Schedule: MS C	4	2020	4	2020
Expedited APS Schedule: Production and Development	1	2021	4	2023
Expedited APS Schedule: IOC	1	2022	1	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 9C90 / *MTVR 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
9C90: *MTVR Mod*	48.806	0.316	1.057	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	50.179
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, MTVR funding has been realigned from project 9C90, MTVR Mod to project 2509, Motor Transport Mod. Realignment of efforts to new projects in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

The Medium Tactical Vehicle Replacement (MTVR) Modification program line funds numerous modifications and initiatives that are required to address operational priorities, engineering change proposals, safety concerns, support equipment inefficiencies, product quality deficiencies, and other issues that affect vehicle reliability, availability, maintainability, readiness, as well as energy efficiency. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management, and it allows the program office the flexibility to develop and implement improvements as needed to respond to the evolving needs of the 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
Title: Product Development	0.150	0.100	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue developing ECPs required to respond to changes in the threat environment and for on-going vehicle modifications.					
FY 2019 Base Plans: FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 decrease of $.100M is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod.					
Title: Support	0.006	0.197	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 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 9C90 / *MTVR Mod*

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 support the initiatives aligning with the Commandant of the Marine Corps (CMC) priority for reducing energy costs, logistics footprint, and an improved environment. - Continue the myriad activities supporting the MTVR vehicle such as ECPs, safety, & survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle from possible catastrophic events, in order to meet current and future operations. ***FY 2019 Base Plans:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod.					
Title: Test and Evaluation	0.160	0.760	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue Test & Evaluation efforts supporting ECP/safety mods of the MTVR as required to provide survivability upgrades in response to continual changes in the threat environment to protect the warfighter and vehicle. - Complete the baseline design qualification testing and begin field user evaluations of components and subsystems that achieve fuel efficiency improvements on the MTVR. ***FY 2019 Base Plans:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease is due to the realignment from project 9C90, MTVR Mod to project 2509, Motor Transport Mod.					
Accomplishments/Planned Programs Subtotals	0.316	1.057	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 9C90 / *MTVR Mod*

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/5050: *MTVR Motor Transport Mods*	6.822	6.551	7.147	18.001	25.148	14.501	8.362	8.514	8.699	Continuing	Continuing
• RDTE/0206624M/2509: *MTVR*	0.000	0.000	3.672	-	3.672	3.940	0.110	0.109	0.121	Continuing	Continuing

Remarks

PMC BLI 5050 Motor Transport Modifications funds multiple programs/projects; only the funding associated with MTVR has been provided as Other APPN/LI 5050. RDTE 0206624M MTVR funding profile is realigned in this Program Element from Proj 9C90 to Proj 2509 for FY19 and future fiscal years.

D. Acquisition Strategy

The strategy for the MTVR Modification initiative is to aid in the prevention of parts obsolescence, address safety concerns, and respond to emergent threats. A proactive and focused approach ensures proper vehicle sustainment and life-cycle management and allows the program office the flexibility to develop and implement improvements as required to respond to evolving needs.

The strategy for the MTVR Fuel Efficiency (FE) initiative is to continue development activities, as program transitioned in September 2016 from the Office of Naval Research, through the various Warfare Centers. Developmental testing will be conducted to verify FE technology data captured by ONR through the FNC effort. Limited User Evaluation testing via Governmental/Commercial facilities will be conducted on production representative items.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 9C90 / *MTVR Mod*	

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
ECP Development	WR	NRL : Washington DC	0.148	0.000		0.100	Feb 2018	0.000		-		0.000	0.000	0.248	-
Prior Years Cumulative Funding	Various	Various : Various	23.205	0.000		0.000		0.000		-		0.000	0.000	23.205	-
Energy Efficiency Initiative Development	C/FFP	Penn State University : State College, PA	0.000	0.150	Jun 2017	0.000		0.000		-		0.000	0.000	0.150	-
		Subtotal	23.353	0.150		0.100		0.000		-		0.000	0.000	23.603	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
Energy Initiative	WR	NSWC : Panama City, FL	1.002	0.006	Sep 2017	0.197	Dec 2017	0.000		-		0.000	0.000	1.205	-
Prior Years Cumulative Funding	Various	Various : Various	11.157	0.000		0.000		0.000		-		0.000	0.000	11.157	-
		Subtotal	12.159	0.006		0.197		0.000		-		0.000	0.000	12.362	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
Energy Initiative Testing	WR	Aberdeen Proving Ground : Aberdeen, MD	0.278	0.160	Jun 2017	0.760	Jan 2018	0.000		-		0.000	0.000	1.198	-
Prior Years Cumulative Funding	Various	Various : Various	13.016	0.000		0.000		0.000		-		0.000	0.000	13.016	-
		Subtotal	13.294	0.160		0.760		0.000		-		0.000	0.000	14.214	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206624M / *Marine Corps Cmbt Services Supt*	Project (Number/Name) 9C90 / *MTVR Mod*	

	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	48.806	0.316		1.057		0.000		-		0.000	0.000	50.179	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 9C90 / *MTVR Mod*

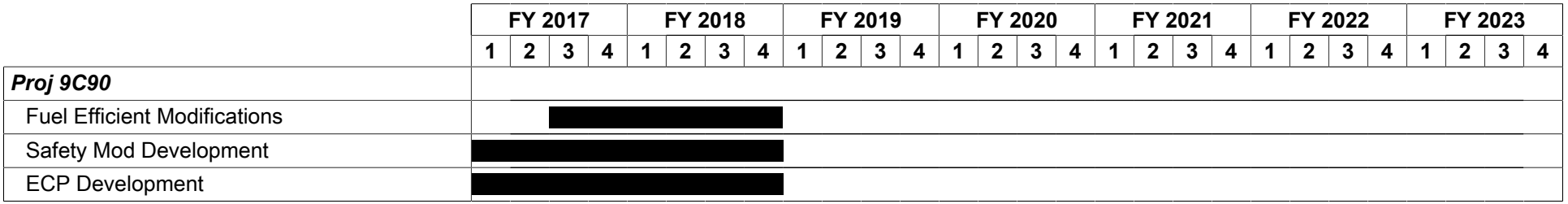


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206624M / *Marine Corps Cmbt Services Supt*	**Project (Number/Name)** 9C90 / *MTVR Mod*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 9C90				
Fuel Efficient Modifications	3	2017	4	2018
Safety Mod Development	1	2017	4	2018
ECP Development	1	2017	4	2018

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206625M *I USMC Intelligence/Electronics Warfare 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
Total Program Element	84.168	22.978	30.886	39.976	-	39.976	33.554	31.510	26.885	27.121	Continuing	Continuing
2272: *Intel Command and Control (C2) Sys*	84.168	22.978	30.886	33.501	-	33.501	27.070	24.916	20.154	20.252	Continuing	Continuing
3771: *Tactical Exploitation of National Capabilities (TENCAP)*	0.000	0.000	0.000	6.475	-	6.475	6.484	6.594	6.731	6.869	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) for Intelligence Command and Control (C2) includes Military Intelligence Program (MIP) funds for Marine Corps Intelligence capabilities necessary to support the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence. It ensures that all-source tactical intelligence is tailored to meet specific mission requirements. The systems collect and convert raw intelligence data on the battlefield into processed information and deliver the processed products to the Intelligence Analysis Systems (IAS) for analysis and dissemination.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	24.187	30.886	33.131	-	33.131
Current President's Budget	22.978	30.886	39.976	-	39.976
Total Adjustments	-1.209	0.000	6.845	-	6.845
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.011	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	-1.216	0.000	7.238	-	7.238
• Rate/Misc Adjustments	0.000	0.000	-0.393	-	-0.393
• Congressional General Reductions Adjustments	-0.004	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($.608) 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-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206625M *I USMC Intelligence/Electronics Warfare Sys*

Increase of $6.845M in FY19 from PB18 reflects funding profile adjustments to align the acquisition phase for the following programs: Communication Emitter Sensing and Attacking System (CESAS), Tactical Signal Intelligence (SIGINT) Collection System (TSCS), Intelligence Analysis System (IAS) and Joint Worldwide Intelligence Communications System (JWICS).

Increase $9.09M between FY18 and FY19 provides funding for the following major Intelligence Command and Control efforts: CESAS development of Electromagnetic Spectrum Operations Range (EMSOR) and Spectrum Services Framework (SSF); TSCS development and integration of Silk Thread and Platform Integration Kit, IAS integration, testing and evaluation of Distributed Common Ground/Surface System (DCGS) Integrated Backbone into the IAS Family of Systems; Joint Worldwide Intelligence Communications System (JWICS) development of Tactical JWICS kits; and TCAC research and development in support of next hardware refresh.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	Project (Number/Name) 2272 / *Intel Command and Control (C2) 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
2272: *Intel Command and Control (C2) Sys*	84.168	22.978	30.886	33.501	-	33.501	27.070	24.916	20.154	20.252	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, TENCAP funding has been realigned from project 2272 to 3771, Tactical Exploitation of National Capabilities. Realignment of efforts to new BLIs in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

Intelligence Command and Control (C2) includes Military Intelligence Program (MIP) funds for Marine Corps Intelligence capabilities necessary to support the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence through all phases of operation. It ensures that all-source tactical intelligence is tailored to meet specific mission requirements. The systems below collect and convert raw intelligence data on the battlefield into processed information and deliver the processed products to the Intelligence Analysis Systems (IAS) for analysis and dissemination.

Tactical Exploitation of National Capabilities (TENCAP) exploits current national reconnaissance systems and programs by examining both technical and operational capabilities, implementing training, and sponsoring concept demonstrations to directly support Marine Corps operating forces. The goal is to pursue technologies which exploit data from national systems to enhance intelligence support to the Marine Air-Ground Task Force (MAGTF) and/or the supported Joint Task Force commander. TENCAP will be funded in Project 3771 in FY19.

Terrestrial Collection provides a tactical ground sensor FoS that are organic to the MAGTF and facilitate near-real time PISR sensing to MAGTF decision-makers and users. Sensors are networked to the maximum extent possible to enable the sharing of standard data and information to support all six Marine Corps warfighting functions (C2,Intelligence, Operations, Protection, Fires, and Maneuver) with both targeting and battlespace awareness. An array of sensor delivery methods, and a variety of sensor characteristics enable the MAGTF to sense air (low altitude), land (surface, underground), sea (surface and subsurface), environmental effects (weather), and man-made objects (e.g. inside buildings) to determine threat location, disposition, movement and direction. Ground Based Operational Surveillance System (G-BOSS), MAGTF Secondary Imagery Dissemination System (MSIDS) and Tactical Remote Sensor System (TRSS) transition to Terrestrial Collection in FY19.

Ground Based Operational Surveillance System (G-BOSS) is an expeditionary, ground-based, self-contained, multi-spectral sensor-oriented, persistent surveillance system used to observe, collect, detect, identify, classify, track, and report on contacts, objects of interest, and assessed threats twenty-four hours a day utilizing a fused video and sensor data display. System variants will allow mobility, transportability, scalability and modularity, and will be capable of independent employment or as part of a network. All G-BOSS variants may be integrated into mutually supporting, closed networks. The G-BOSS variants are: G-BOSS Light (GBL): A tripod-mounted variant that provides short-range surveillance support. It is employed when surveillance support is required, but location and operational requirements are impractical to employ either of the two other variants. G-BOSS Medium (GBM): A trailer-mounted variant that provides longer range surveillance and is transported using a light trailer and tactical vehicle while in support of mobile combat operations, convoy security, temporary security operations, etc. G-BOSS Heavy (GBH): The 80-foot tall tower

configuration, Heavy variant provides surveillance support of a more permanent nature. It is employed when operations are static, displacements are few, and longer surveillance ranges are desired. G-BOSS transitions to Terrestrial Collection in FY19.

MAGTF Secondary Imagery Dissemination System (MSIDS) provides organic tactical digital imagery collection, transmission and receiving capability to the MAGTF Commander. MSIDS is comprised of components necessary to enable Marines to capture, manipulate, annotate, transmit or receive images in Near Real Time (NRT), internally with subordinate commands that are widely separated throughout the area of operations and externally with higher and adjacent commands. The MSIDS capability resides with the Marine Air-Ground Task Force (MAGTF) Intelligence sections and Ground Reconnaissance Battalions, Infantry Battalion Scout Sniper Platoons and Marine Corps Forces Special Operations Command. The MSIDS Family of Systems (FoS) extends the digital imaging capability to all echelons within the Marine Expeditionary Force (MEF), down to and including battalions and squadrons. Captured images can be forwarded throughout the MAGTF through the use of Base Station Workstation/Communication Interface (BW/CI), Outstation Workstation/Communication Interface (OW/CI) or existing C4ISR architecture. Images can also be transmitted to DCGS-MC for more detailed processing and analysis. The Video Exploitation Workstation (VEW) is used to import, manipulate, annotate still and video imagery, create intelligence products, lift still frames from video, view multi-format TV signals and provide a field briefing capability. MSIDS transitions to Terrestrial Collection in FY19.

Tactical Remote Sensor System (TRSS) provides all-weather direction, location determination, targeting, and tactical indications and warning of enemy activity in the MAGTF Commander's Area of Interest. Upgrades to the system provide imagers with a remotely changeable field of view; more reliable, networked communications that provide higher-quality imagery; and smaller, power-efficient, magnetic detectors with improved target-detection range. The cumulative impact of these changes enable the system to provide higher discrimination of threats in a more reliable and timely manner. As the program proceeds, the upgrade of individual system components will continue to occur as needed as threats, technologies, and system requirements evolve. Enhancements to the current baseline will improve sensor monitoring systems and include a magnetic sensor upgrade. It will also provide for a Common Sensor Radio, self-networking communications for sensors and retransmission devices. TRSS transitions to Terrestrial Collection in FY19.

PERSISTENT INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE (PISR) GROUND COLLECTION SYSTEMS: PISR is a comprehensive strategy that synchronizes organic and external ISR assets in support of MAGTF operations. This capability involves sensing the operational environment through a variety of systems, from satellites overhead to reconnaissance Marines on the ground. PISR incorporates terrestrial sensing capability from the following ground collection systems.

Communication Emitter Sensing and Attacking System (CESAS) is the sole USMC high power, man-packable, and ground mobile Electronic Attack (EA) asset. CESAS supports the MAGTF Commander in the execution of his Electronic Warfare (EW) operations and Information Operations, by detecting, denying, and disrupting hostile communication emitters across a broad range of communication frequencies. CESAS covers the High Frequency (HF), Very High Frequency (VHF), and Ultra High Frequency (UHF) frequency ranges against enemy emitters using modern modulation schemes. CESAS allows flexible employment to conduct EA while on the move or in a stationary position, thus optimizing the Commander's ability to employ this asset for the greatest success of the mission.

Counter Intelligence and Human Intelligence (CI/HUMINT) Equipment Program (CIHEP) provides each Marine CI/HUMINT Company within the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE) with an integrated, standardized, and interoperable suite of information and communication

systems. The CIHEP program provides specialized equipment that is lightweight, modular, and tailorable, in deployable packages to conduct full spectrum, tactical CI and HUMINT activities, to include Technical Surveillance Countermeasures (TSCM) operations. TSCM operations use techniques to detect, neutralize, and exploit hostile technical surveillance technologies and hazards that permit the unauthorized access to or removal of information. CI/HUMINT elements are generally task-organized in support of a MAGTF or other supported commanders, providing them the capability to rapidly collect, process, and disseminate counterintelligence and human intelligence information in support of military planning and operations. CIHEP is comprised of ten modules of commercial and government off the-shelf equipment. Different components are selected for refresh each year in order to maintain current capabilities and ensure interoperability and standardization with related systems. This results in an equipment suite that enhances the operating force's CI/HUMINT capabilities, while maintaining interoperability within the USMC and joint CI/HUMINT communities. The modularity of the CIHEP program allows Marines to perform a variety of missions in support of commanders, while carrying only those items necessary to accomplish the mission. CIHEP provides state- of-the-art mission critical information protection capabilities, as well as the ability to detect, identify, and locate specific technical threats.

Tactical Signal Intelligence (SIGINT) Collection System (TSCS) provides modular, lightweight and team/man transportable/portable systems and components which provide signal intercept, collection, Direction-Finding (DF), reporting and collection management capability to the MAGTF Commander. It provides the MAGTF Commander with a modular and scalable carry on/carry off suite of equipment which exploits information from more technically advanced target sets. TSCS uses rapid technology insertion processes and procedures to incorporate advanced SIGINT technology to allow the MAGTF Commander to maintain technological parity with the adversary.

PROCESSING, EXPLOITATION, ANALYSIS AND PRODUCTION SYSTEMS: Processing, exploitation, analysis and production actions of the Intelligence process enables Marines to understand the all-source information/data revealed by PISR. The Distributed Common Ground System - Marine Corps (DCGS-MC) Enterprise (BLI 4767) will serve as the Marine Corps ISR Enterprise (MCISRE) backbone, migrating select capabilities into a single, integrated, net-centric baseline via clearly defined capability drops.

Intelligence Analysis System (IAS) FoS is the All-Source Fusion Center that provides interoperable, scalable, semi-automated capabilities to receive, analyze, display, and disseminate all-source intelligence, including imagery, to support timely, tactical decision-making across the MAGTF. IAS will transition to DCGS-MC as the All Source Fusion capability.

Technical Control Analysis Center (TCAC) Family of systems consists of the AN/UYQ-83 TCAC Remote Analysis Workstation (RAWS), AN/MYQ-9 TCAC Transportable Workstation, and Cross Domain Solution (CDS), and is the focal point of Radio Battalions (RADBN), Marine Corps Forces Special Operations Command (MARFORSOC), and Fixed Wing Marine EA Squadron (VMAQ) SIGINT operations. TCAC automatically collects, stores, retrieves and plays back digital audio signals, and fuses and analyzes SIGINT data from tactical, theater and national collectors and databases for dissemination to tactical commanders. TCAC provides SIGINT analysis applications to deployable MAGTF units capable of directing and managing the technical and operational functions of other RADBN SIGINT/EW assets. TCAC provides termination of national, theater and tactical data networks for data exchange with tactical SIGINT/EW assets, the IAS and national databases. TCAC will enable the transfer of USMC tactical SIGINT collection and analytical data into the Real-Time Regional Gateway (RT-RG) and also by producing DCGS-MC Integrated Backbone (DIB) enabled products that will be discoverable by any DCGS enabled Marine. The system provides ground processing of EW information, including EW

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

Support and EA data collected by the RADBN and WMAQ-EA-6B aircraft. The system is capable of correlating, fusing, and evaluating radar emitter identification and location data from the EA-6B with other National and theater sources. TCAC will transition to DCGS-MC as the Signals Intelligence capability.

INTELLIGENCE DISSEMINATION AND UTILIZATION (IDU) SYSTEMS: The IDU capability set performs the dissemination and integration functions of the Intelligence process. Dissemination connects the Intelligence product to the Commander who "operationalizes" these products through informed decisions.

The Intelligence Broadcast Receiver (IBR) acquisition program is a family of terminals that conform to the Department of Defense (DoD) Integrated Broadcast Service (IBS) objectives of interoperability and commonality to receive and process near-real time multi-intelligence data. The IBR family of terminals provide MAGTF Commanders with the only direct access to IBS data via UHF Satellite Communications (SATCOM) broadcast channels. The IBR program is an evolving, multi-Service architecture designed to keep pace with Commanders' targeting and information requirements and conforms to the DoD IBS objectives of interoperability and commonality, which is currently accomplished using the Universal Serial Bus (USB) Embedded National Tactical Receiver (ENTR). The ENTR Version 4 (V4) will supplement and replace the USB ENTR which is no longer in production. The ENTR V4 provides a 50% weight reduction and doubles the life expectancy of the battery compared to the USB ENTR. The IBR family of terminals receive Blue Force Tracker data, which is a key element in developing and maintaining situational awareness as it relates to the common threat/common operating picture. The IBR provides NRT strategic, theater, and tactical sensor-to-shooter connectivity as well as NRT Theater Missile Defense indications and warnings. Additionally, the IBR provides connectivity to IBS Common Interactive Broadcast and IBS Alternative Path.

Joint Worldwide Intelligence Communications System (JWICS) is the Top Secret Sensitive Compartmented Information (TS/SCI) portion of the Defense Information System Network. It incorporates advanced networking technologies that permit point-to-point or multi-point information exchange involving voice, text, graphics, data and video teleconferencing within the DoD Intelligence Community. JWICS provides Marine Forces with special intelligence that significantly enhances the detail and quality of intelligence support that intelligence organizations provide to operating forces.

Sensitive Compartmented Information Communications (SCI COMMS) is a Super-High Frequency multi-band satellite communications Family of Systems (FoS), that provides a tactical capability at the Top Secret (TS)/SCI and Secret Collateral levels lo USMC intelligence units. The SCI COMMS FoS is the only deployable communications system that is dedicated for TS/SCIdata and voice communications that can receive, transmit and disseminate bulk data and imagery products to and from national tactical intelligence sources. The FoS consists of palletized, team level, and man-packable systems - TROJAN SPIRIT, High Bandwidth Special Intelligence-Palletized Terminal (HBSI-PT), and Sensitive Compartmented Intelligence Kit (SCIK) - which provide USMC tactical commanders with high-capacity, near-real-time access to intelligence from national agencies, joint, coalition, service activities, intelligence producers, and other tactical units via connectivity to Joint Worldwide Intelligence Communications System, National Security Agency (NSA) Network, coalition networks, and Secret Internet Protocol Router 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: *Communication Emitter Sensing and Attacking System (CESAS): Product Development	0.696	3.294	6.383	0.000	6.383
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Initiate planning to transition CESAS Next Generation advanced digital payload/electronic warfare technology. Provide required hardware/software modifications to CESAS II/RREMPEAS and hardware modifications to HMMWV PIK to enhance capability via ECPs. Initiate hardware/software capability enhancements including CESAS Next Generation advanced digital payload/electronic warfare technology. ***FY 2019 Base Plans:*** -Initiate development of Electromagnetic Spectrum Operations Range (EMSOR), Spectrum Services Framework (SSF), Joint Light Tactical Vehicle (JLTV) Platform Integration Kit (PIK) and transition to CESAS Next Generation advanced digital payload/electronic warfare technology. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** $3.089M increase from FY18 to FY19 will initiate development of Electromagnetic Spectrum Operations Range (EMSOR), Spectrum Services Framework (SSF), Joint Light Tactical Vehicle (JLTV) Platform Integration Kit (PIK), and transition to CESAS Next Generation advanced digital payload/electronic warfare technology.					
Title: *Communication Emitter Sensing and Attacking System (CESAS): Support	0.017	0.025	0.039	0.000	0.039
Articles:	-	-	-	-	-
FY 2018 Plans: Continue to provide program support for required hardware/software modifications to CESAS II/RREMPEAS/ HMMWV PIK. Initiate program support for required modifications to CESAS Next Generation advanced digital payload/ electronic warfare technology. ***FY 2019 Base Plans:*** Continue to provide program support for required hardware/software modifications to CESAS II/RREMPEAS/ CESAS Next Generation advanced digital payload/electronic warfare technology and hardware modifications to HMMWV PIK to enhance capability via Engineering Change Proposals (ECPs). ***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 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
No significant change from FY 2018 to FY 2019.					
Title: *Counterintel and Human Intel Equip (CIHEP): Test and Evaluation	0.385	0.325	0.332	0.000	0.332
Articles:	-	-	-	-	-
FY 2018 Plans: - Continues to provide engineering, integration and technical support required for planned CIHEP modernization of the TSCM (Tactical Surveillance Counter Measures) equipment and CIHEP Family of Systems (FOS).					
FY 2019 Base Plans: - Continue to provide engineering, integration and technical support required for planned CIHEP modernization of the TSCM (Tactical Surveillance Counter Measures) equipment and CIHEP Family of Systems (FOS).					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: No significant change from FY 2018 to FY 2019.					
Title: *Counterintel and Human Intel Equip (CIHEP): Product Development	0.300	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 significant change from FY 2018 to FY 2019.					
Title: *Intelligence Analysis System (IAS): Product Development	2.690	4.862	3.905	0.000	3.905
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue integration, system testing, and evaluation of advanced analytic technologies into the Intelligence Analysis					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
System (IAS) Family of Systems (FoS). - Initiate integration, system testing, and evaluation of Intelligence Servers into the IAS FoS. - Initiate integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS. - Complete integration, system testing, and evaluation of the Global Command & Control System - Joint (GCCS-J) 6.0 into the IAS FoS. ***FY 2019 Base Plans:*** - Continue integration, system testing, and evaluation of Intelligence Servers into the IAS FoS. - Continue integration, system testing, and evaluation of advanced analytic technologies into the Intelligence Analysis System (IAS) Family of Systems (FoS). - Complete integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.957M from FY 18 to FY 19 reflects the completion of the DCGS Integrated Backbone into the IAS FoS.					
Title: *Intelligence Analysis System (IAS): Support	1.182	0.966	0.567	0.000	0.567
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue program management support for integration of advanced analytics tools into the IAS FoS software baseline. - Initiate program management support for integration and testing of Intelligence Servers into the IAS FoS. - Initiate integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS. - Complete program management support for integration and testing of GCCS-J 6.0 in the IAS FoS. ***FY 2019 Base Plans:*** - Continue program management support for integration of advanced analytics tools into the IAS FoS software baseline. - Continue program management support for integration and testing of Intelligence Servers into the IAS FoS. - Continue integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

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 $0.399M from FY 18 to FY 19 reflects the completion of the integration and testing of GCCS-J 6.0 in the IAS FoS.					
Title: *Intelligence Analysis System (IAS): Test and Evaluation ***Articles:*** ***FY 2018 Plans:*** - Continue support for integration of advanced analytics tools into the IAS FoS software baseline. - Initiate support for integration and testing of Intelligence Servers into the IAS FoS. - Initiate integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS. - Complete support for integration and testing of GCS-J 6.0 in the IAS FoS. ***FY 2019 Base Plans:*** - Continue support for integration of advanced analytics tools into the IAS FoS software baseline. - Continue support for integration and testing of Intelligence Servers into the IAS FoS. - Continue integration, system testing, and evaluation of DCGS Integrated Backbone into the IAS FoS. - Initiate testing and evaluation for the Cross Domain Solution. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.739M from FY 18 to FY 19 supports integration and testing of the Tier I servers and Cross Domain Solution for the IAS FoS.	0.299 -	0.961 -	1.700 -	0.000 -	1.700 -
Title: *Intelligence Broadcast Receiver (IBR): Product Development ***Articles:*** ***FY 2018 Plans:*** - Continue required interoperability software testing support for Joint Integration Test Command certification for Tactical Receive Segment (TRS). - Continue ENTR system integration and test support, CIB upgrade and system optimization support, and CIB operational testing.	0.110 -	0.474 -	0.476 -	0.000 -	0.476 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate the Networking-On-The-Move (NOTM) integration and Integrated Broadcast System (IBS) server producer capability. ***FY 2019 Base Plans:*** - Continue ENTR system integration and test support, CIB upgrade and system optimization support, and CIB operational testing. - Continue the Networking-On-The-Move (NOTM) integration and Integrated Broadcast System (IBS) server producer capability. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: *SCI COMMS: Product Development	0.017	0.168	0.395	0.000	0.395
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate efforts to procure new test assets, such as controlled cryptographic items, to support security-based product improvements and ECPs. ***FY 2019 Base Plans:*** - Continue efforts to develop new test assets, such as modems, monitors, and control devices to support security-based product improvements and ECPs ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: *SCI COMMS: Support	0.000	0.110	0.113	0.000	0.113
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate development of ECPs for end-of-life/end-of-sale equipment and modernization efforts. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

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 ECPs for end-of-life/end-of-sale equipment and modernization efforts for security-based products. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: *SCI COMMS: Test and Evaluation ***Articles:*** ***FY 2018 Plans:*** - Initiate test and evaluation efforts which support engineering change proposals (ECPs) such as cryptographic item refresh. ***FY 2019 Base Plans:*** - Continue test and evaluation efforts which support engineering change proposals (ECPs) such as modems and monitor control devices. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.125M from FY18 to FY19 supports test and evaluation activities associated with security-based product improvements such as Controlled Cryptographic Items (CCI), Network Package Netflow, and Coalition Network.	0.050 -	0.073 -	0.198 -	0.000 -	0.198 -
Title: *Tactical Exploitation of National Capabilities (TENCAP): Product Development & Technical Assessments ***Articles:*** ***Description:*** Tactical Exploitation of National Capabilities (TENCAP): Decrease of $6.448M from FY18 to FY19 as program transitions to Project C3771. ***FY 2018 Plans:*** - Continue to conduct research and development, advanced technology demonstrations, and integration of emerging technologies into the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE).	4.115 -	6.448 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

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 support the Congressionally mandated TENCAP office and all associated ongoing activities, to include the coordination with national agencies, the intelligence community, research laboratories, private industry, and academia, for exploration of collaborative Science and Technology (S&T)/R&D efforts to bring evolutionary intelligence capabilities to the operating forces. - Continue to provide technical assessments and field utility evaluations for the integration of current and emerging intelligence capabilities into the tactical decision making process. - Continue to support operational planning and enhance operating force capabilities through the identification and development of advanced technologies for the MCISRE architecture. - Continue training and education efforts by providing the operating forces with supported simulation, visualization, and improved mission planning capabilities. - Initiate efforts to provide transition support to Rapid Reliable Targeting (RRT). - Initiate efforts for the development of Process, Exploitation, and Dissemination (PED) capability to the Command Level Intelligence Cell (CLIC) ***FY 2019 Base Plans:*** Refer to Project: 3771; TENCAP will be funded in 3771 in FY19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $6.448M from FY18 to FY19 as program transitions to Project C3771.					
Title: *Tactical Signal Intelligence (SIGINT) Collection System (TSCS): Product Development	3.320	2.403	5.330	0.000	5.330
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue software development and integration for the software defined receivers (SDRs). - Continue firmware upgrades to software defined receivers Field Programmable Gate Array (FPGA). - Continue development of the Aviation PIK. - Continue development of the TSCS Modular Case. - Initiate market research for next generation Software Defined Receivers, Antennas, and TSCS Body Worn System. ***FY 2019 Base Plans:*** - Continue software development and integration for the software defined receivers.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue firmware upgrades to software defined receivers Field Programmable Gate Array (FPGA). - Continue development of the Aviation PIK. - Continue development of the TSCS Modular Case. - Initiate development and integration of advanced digital payload/electronic warfare techonolgy and Platform Integration Kit. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $2.927M from FY18 to FY19 initiates development and integration of advanced digital payload/ electronic warfare technology and Platform Integration Kits.					
Title: *Tactical Signal Intelligence (SIGINT) Collection System (TSCS): Support ***Articles:***	0.033 -	0.035 -	0.000 -	0.000 -	0.000 -
FY 2018 Plans: - Continue to provide program support and management for ongoing developmental testing, engineering drawings, environmental testing for server sleeves. ***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: *Tactical Signal Intelligence (SIGINT) Collection System (TSCS): Test and Evaluation ***Articles:***	1.957 -	2.720 -	2.520 -	0.000 -	2.520 -
FY 2018 Plans: - Initiate TSCS Modular Case testing. - Conduct development testing on software baseline. - Initiate testing on the Advanced Signal Processor. ***FY 2019 Base Plans:*** - Continue TSCS Modular Case testing.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

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 testing on software baseline. - Continue integration testing with software defined radios and TSCS Modular Case testing. - Continue testing on the Advanced Signal Processor. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: *Technical Control and Analysis Center (TCAC): Product Development	2.537	3.094	3.515	0.000	3.515
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue system development and system design for JICD 4.2 and TWS software baseline. - Initiate research and development in support of next hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/CDS). ***FY 2019 Base Plans:*** - Continue system development and system design for JICD 4.2 and TWS software baseline. - Continue research and development in support of next hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/CDS). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.421M from FY18 to FY19 initiates assessments, testing, and development of program SCI hardware for refresh.					
Title: *Technical Control and Analysis Center (TCAC): Support	0.321	0.315	0.291	0.000	0.291
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue technical support of improvements to TCAC baseline. - Initiate technical support for next TCAC hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/CDS). ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue technical support of improvements to TCAC baseline. - Continue technical support for next TCAC hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/ CDS). ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change from FY 2018 to FY 2019.					
Title: *Technical Control and Analysis Center (TCAC): Test and Evaluation	2.051	1.640	2.534	0.000	2.534
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue integration and testing of JICD 4.2 and TWS software baseline. - Initiate research and test design in support of next hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/CDS). ***FY 2019 Base Plans:*** - Continue integration and testing of JICD 4.2 and TWS software baseline. - Continue research and test design in support of next hardware refresh/TCAC FoS capability enhancement (RAWS/TWS/CDS). - Initiate assessments, testing , and development of program SCI hardware for refresh. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.894M from FY18 to FY19 initiates assessments, testing, and development of program SCI hardware for refresh.					
Title: *Joint Worldwide Intel Comms Sys (JWICS): Product Development	2.800	0.000	1.714	0.000	1.714
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 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The SCI Enterprise Office (SEO) will conduct research, development, testing and evaluation (RDT&E) to engineer a deployable voice, video, data, and circuit realignment solution that will provide the warfighter JWCIS services in the tactical environment. The solution(s) developed will re-engineer the High Bandwidth Special Intelligence Palletized Terminal (HBSI-PT) communications path to reduce the latency for Marine Corps Joint Worldwide Intelligence Communication (JWICS) network, by development of a tactical Point of Presence (POP). The solution(s) will house enterprise services such as Active Directory (AD), Dynamic Host Control Protocol (DHCP), distributed files services (DFS), data storage, and print services behind a tactical node. This effort will also research the potential use of cloud services for continuity of tactical operations support. The solution(s) will increase the warfighters ability to produce useful and timely intelligence in a reliable, efficient manner. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $1.714M from FY18 to FY19 reflects RDTE necessary to engineer a deployable voice, video, data, and circuit realignment solution that will provide the warfighter JWICS services in the tactical environment.					
Title: *Ground-Based Operational Surveillance System: Test and Evaluation	0.000	1.800	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate integration, system testing, and evaluation of advanced network components and sensor assets into all three variants of G-BOSS as part of scheduled technical refresh. End state of developmental efforts is to replace obsolete commercial-off-the-shelf (COTS) components via Engineering Change Proposal (ECP) process. ***FY 2019 Base Plans:*** - Transitions to Terrestrial Collection ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

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 $1.8M in FY19 reflects the transition of GBOSS to Terrestrial Collection.					
Title: *MAGTF Secondary Imagery Dissemination System (MSIDS): Test and Evaluation	0.000	0.171	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: -Initiate test and evaluation effort for Base Station and Outstation data controllers to improve data throughout for compatibility with a new organic tactical radio waveform. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.171M from FY18 to FY19 reflects the transition of MSIDS to Terrestrial Collection.					
Title: *Tactical Remote Sensor System (TRSS): Product Development	0.098	0.200	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue development of software changes to properly receive, parse, and display messages from systems with improved radios as well as interface directly with these systems to program them. Will initiate development of hardware and software to replace obsolete Hand Held Programmable Monitors (HHPM) which will be utilized to configure and monitor the operation of the sensor network. ***FY 2019 Base Plans:*** - Transitions to Terrestrial Collection ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.200M from FY18 to FY19 reflects the transition of TRSS to Terrestrial Collection.					
Title: *Tactical Remote Sensor System (TRSS): Test and Evaluation	0.000	0.802	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

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: Initiate engineering efforts to determine the acceptability of the Signature Data Recorder (SDR),Hand Held Programmable Monitor (HHPM) and Common Sensor Radio (CSR) to include hardware and software testing. ***FY 2019 Base Plans:*** - Transitions to Terrestrial Collection ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.802M from FY18 to FY19 reflects the transition of TRSS to Terrestrial Collection.					
Title: *Terrestrial Collection: Product Development	0.000	0.000	1.088	0.000	1.088
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** - Initiate development of Imager IIA software and hardware in order to properly receive, parse, and display messages; program, and confirm operational status of end items within the TRSS systems of systems. - Initiate development of TRSS Sentinel software changes to properly receive, parse, and display messages from systems with improved radios as well as interface directly with these systems to program them. - Initiate development of TRSS laptop software and hardware in order to properly receive, parse, and display messages, program, and confirm operational status of end items within the TRSS systems of systems. - Initiate integration system testing, and evaluation of advanced network components and sensor assets into all three variants of G-BOSS as part of scheduled technical refresh. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $1.088M from FY18 to FY19 is attributable to GBOSS, MSIDS, and TRSS consolidation into Terrestrial Collection.					
Title: *Terrestrial Collection: Test and Evaluation	0.000	0.000	1.401	0.000	1.401

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

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: N/A ***FY 2019 Base Plans:*** - Continue MSIDS test and evaluation effort for Base Station and Outstation data controllers to improve data throughout for compatibility with a new organic tactical radio waveform. - Continue integration, system testing, and evaluation of advanced network components and sensor assets into all three variants of G-BOSS as part of scheduled technical refresh. End state of developmental efforts is to replace obsolete commercial-off-the-shelf (COTS) components via Engineering Change Proposal (ECP) process. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $1.401M from FY18 to FY19 is attributable to GBOSS, MSIDS, and TRSS consolidation into Terrestrial Collection.					
Title: *Terrestrial Collection: Support	0.000	0.000	1.000	0.000	1.000
Articles:	-	-	-	-	-
FY 2018 Plans: N/A ***FY 2019 Base Plans:*** - Initiate technical support and technical engineering efforts related to developmental test,electromagnetic test range utilization, developmental test range utilization, functional verification testing, and physical movement of test assets to and from system integrator facilities to test ranges associated with tech refresh of advanced network components and sensor assets into all three variants of G-BOSS. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

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 $1.000M from FY18 to FY19 is attributable to GBOSS, MSIDS, and TRSS consolidation into Terrestrial Collection.					
Accomplishments/Planned Programs Subtotals	22.978	30.886	33.501	0.000	33.501

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/474703: *TCAC*	4.874	4.581	6.749	-	6.749	4.276	4.262	2.853	2.938	Continuing	Continuing
• PMC/474761: *IAS*	17.160	8.396	9.570	-	9.570	7.770	11.165	8.210	8.375	Continuing	Continuing
• PMC/700000: *IAS SPARES*	0.128	0.158	0.160	-	0.160	0.166	0.169	0.172	0.176	Continuing	Continuing
• PMC/474709: *CIHEP*	17.830	3.525	6.066	-	6.066	12.976	6.010	6.246	6.323	Continuing	Continuing
• PMC/474702: *TSCS*	13.484	9.496	23.173	-	23.173	21.626	11.744	10.910	11.233	Continuing	Continuing
• PMC/474701: *CESAS*	12.243	9.223	5.556	-	5.556	5.188	10.218	11.150	14.022	Continuing	Continuing
• PMC/474700: *SCI COMMS*	7.136	6.402	7.325	-	7.325	1.859	0.246	0.251	0.256	Continuing	Continuing
• PMC/700003: *TRSS SPARES*	0.053	0.099	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/700005: *MSIDS SPARES*	0.084	0.099	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
• PMC/474752: *IBR*	1.420	6.697	4.352	-	4.352	3.015	1.495	1.510	1.540	Continuing	Continuing
• PMC/474713: *TRSS*	1.536	2.638	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.022
• PMC/474719: *MSIDS*	2.942	2.503	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.445
• PMC/4747XX: *G-BOSS*	0.000	1.200	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.200
• PMC/4747XY: *JWICS*	29.963	4.098	4.615	-	4.615	4.701	4.792	8.022	7.586	Continuing	Continuing
• PMC/4747TC: *TERRESTRIAL COLLECTION*	0.000	0.000	6.442	-	6.442	2.976	0.783	0.687	2.701	Continuing	Continuing
• PMC/700006: *TERRESTRIAL COLLECTION SPARES*	0.000	0.000	0.261	-	0.261	0.200	0.202	0.206	0.210	Continuing	Continuing

Remarks

D. Acquisition Strategy

(U) SCI COMMS: SCI COMMS leverages SSC-LANT support for Engineering Change Proposal (ECP) support and existing Army Communication-Electronic Command (CECOM) Small Business Innovation Research (SBIR) contract for test asset procurement.

(U) TCAC: The acquisition of components for the TCAC will maximize the use of existing equipment, NDI/COTS/GFE equipment/software.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

(U) TRSS: TRSS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) MSIDS: MSIDS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) IAS: IAS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) CIHEP: CIHEP makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) IBR: IBR software upgrades are developed at Naval laboratories and integrated into the system. IBR makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) TENCAP: All work will be led in-house and necessary contractor support will be acquired using existing contracts. Research, test and integrate new technology and conduct advanced technology demonstrations to identify the most appropriate programs which are mature for integration of emerging technologies into the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISR-E).

(U) CESAS: CESAS II production will consist of COTS and NDI integration into an existing GOTS architecture. Production efforts will be conducted at Naval laboratories.

(U) TSCS: TSCS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) G-BOSS: Tech refresh for sustainability to ensure operational readiness of the G-BOSS assets, assumes required engineering and logistics refresh funded per additional capability initiative.

(U) JWICS: JWICS makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

(U) Terrestrial Collection: Tech refresh for sustainability to ensure operational readiness of the G-BOSS assets, assumes required engineering and logistics refresh funded per additional capability initiative. Makes maximum use of COTS, GOTS and NDI with Firm Fixed Price Production.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	Project (Number/Name) 2272 / *Intel Command and Control (C2) 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
Prior Years Cumulative Funding	Various	Various : Various	29.929	0.000		0.000		0.000		-		0.000	0.000	29.929	-
CESAS	WR	SPAWAR : CHARLESTON, SC	2.775	0.696	Dec 2016	3.294	Dec 2017	6.383	Dec 2018	-		6.383	Continuing	Continuing	Continuing
CIHEP	WR	SPAWAR3 : CHARLESTON, SC	0.000	0.300	Nov 2016	0.000		0.000		-		0.000	0.000	0.300	-
IAS	WR	SPAWAR : CHARLESTON, SC	1.725	1.201	Nov 2016	1.737	Nov 2017	0.000		-		0.000	0.000	4.663	-
IAS	C/CPFF	SPAWAR A3 : CHARLESTON, SC	0.039	1.489	Feb 2017	3.125	Feb 2018	3.905	Feb 2019	-		3.905	Continuing	Continuing	Continuing
IBR	Various	VARIOUS : VARIOUS	0.100	0.110	Dec 2016	0.474	Dec 2017	0.476	Dec 2018	-		0.476	Continuing	Continuing	Continuing
SCI COMMS	C/FFP	CECOM : ABERDEEN, MD	0.073	0.017	Sep 2017	0.168	Mar 2018	0.395	Jul 2019	-		0.395	Continuing	Continuing	Continuing
TENCAP	C/IDIQ	NSMA : BOLLING AFB	0.000	0.098	Mar 2017	0.000		0.000		-		0.000	0.000	0.098	-
TENCAP	C/IDIQ	SPAWAR-2 : CHARLESTON, SC	0.000	0.092	Aug 2017	0.000		0.000		-		0.000	0.000	0.092	-
TENCAP	C/CPFF	DTIC-1 : FT. BELVOIR	11.547	1.086	Oct 2016	0.000		0.000		-		0.000	0.000	12.633	-
TENCAP	WR	SPAWAR : CHARLESTON, SC	1.782	0.208	Oct 2016	0.450	Oct 2017	0.000		-		0.000	0.000	2.440	-
TENCAP	C/CPFF	DTIC-2 : FT. BELVOIR	0.010	2.631	Jan 2017	5.998	Oct 2017	0.000		-		0.000	0.000	8.639	-
TSCS	WR	SPAWAR : CHARLESTON, SC	4.942	3.320	Dec 2016	2.403	Mar 2018	5.330	Mar 2019	-		5.330	Continuing	Continuing	Continuing
TCAC	C/CPFF	SPAWAR2 : Charleston, SC	1.572	0.342	Jan 2017	0.228	Jan 2018	0.800	Jan 2019	-		0.800	Continuing	Continuing	Continuing
TCAC	WR	SPAWAR8 : San Diego, CA	8.926	2.195	Jan 2017	2.866	Jan 2018	2.715	Jan 2019	-		2.715	Continuing	Continuing	Continuing
JWICS	C/CPFF	DTIC-2 : FT. BELVOIR	0.000	2.800	May 2017	0.000		1.714	Sep 2019	-		1.714	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	Project (Number/Name) 2272 / *Intel Command and Control (C2) 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
TRSS	WR	SPAWAR-A2 : CHARLESTON, SC	0.195	0.098	Nov 2016	0.200	Nov 2017	0.000		-		0.000	0.000	0.493	-
Terrestrial Collection	WR	SPAWARTC : CHARLESTON, SC	0.000	0.000		0.000		1.088	Nov 2018	-		1.088	Continuing	Continuing	Continuing
		Subtotal	63.615	16.683		20.943		22.806		-		22.806	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	Not Specified : Not Specified	2.687	0.000		0.000		0.000		-		0.000	0.000	2.687	-
CESAS	Various	MCSC9 : QUANTICO, VA	0.781	0.017	Sep 2017	0.025	Sep 2018	0.039	Sep 2019	-		0.039	Continuing	Continuing	Continuing
IAS	C/CPFF	DTIC : Fort Belvoir, VA	1.748	0.291	Jul 2017	0.662	Apr 2018	0.000		-		0.000	0.000	2.701	-
IAS	C/FFP	CECOM : FT. BELVOIR, VA	0.000	0.891	Nov 2016	0.304	Oct 2017	0.000		-		0.000	Continuing	Continuing	Continuing
IAS	C/CPFF	SPAWAR : Charleston, SC	0.000	0.000		0.000		0.567	Feb 2019	-		0.567	0.000	0.567	-
SCI COMMS	WR	SPAWAR : Charleston, SC	0.172	0.000		0.110	Feb 2018	0.113	Feb 2019	-		0.113	Continuing	Continuing	Continuing
TSCS	Various	MCSC20 : QUANTICO, VA	0.125	0.033	Aug 2017	0.035	Aug 2018	0.000		-		0.000	Continuing	Continuing	Continuing
TCAC	MIPR	DTIC : FT Belvoir, VA	1.683	0.284	Apr 2017	0.300	Apr 2018	0.000		-		0.000	0.000	2.267	-
TCAC	WR	SPAWAR-P : San Diego, CA	3.568	0.000		0.000		0.276	Apr 2019	-		0.276	Continuing	Continuing	Continuing
TCAC	Various	MCSC26 : QUANTICO, VA	0.006	0.037	Sep 2017	0.015	Sep 2018	0.015	Sep 2019	-		0.015	Continuing	Continuing	Continuing
Terrestrial Collection	WR	NSWC CRANE : Crane, IN	0.000	0.000		0.000		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 / 7	R-1 Program Element (Number/Name) PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	Project (Number/Name) 2272 / *Intel Command and Control (C2) Sys*	

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	10.770	1.553		1.451		2.010		-		2.010	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
Prior Years Cumulative Funding	Various	Various : Various	8.033	0.000		0.000		0.000		-		0.000	0.000	8.033	-
CIHEP	WR	SPAWAR-A4 : CHARLESTON, SC	0.490	0.385	Nov 2016	0.325	Nov 2017	0.332	Nov 2018	-		0.332	Continuing	Continuing	Continuing
IAS	C/FFP	DTIC : FT. BELVOIR, VA	0.000	0.299	Apr 2017	0.500	Apr 2018	0.000		-		0.000	0.000	0.799	-
IAS	WR	SPAWAR : CHARLESTON, SC	0.000	0.000		0.461	Nov 2017	1.700	Feb 2019	-		1.700	Continuing	Continuing	Continuing
SCI COMMS	TBD	MCIA : QUANTICO, VA	0.000	0.050	Mar 2018	0.073	Mar 2018	0.198	Mar 2019	-		0.198	Continuing	Continuing	Continuing
TSCS	WR	SPAWAR : CHARLESTON, SC	0.719	1.957	Dec 2016	2.720	Dec 2017	2.520	Dec 2018	-		2.520	Continuing	Continuing	Continuing
TCAC	C/CPFF	SPAWAR8 : CHARLESTON, SC	0.541	0.590	Feb 2017	0.586	Feb 2018	0.971	Feb 2019	-		0.971	Continuing	Continuing	Continuing
TCAC	C/CPFF	SPAWAR9 : SAN DIEGO, CA	0.000	1.461	Jan 2017	1.054	Jan 2018	1.563	Jan 2019	-		1.563	Continuing	Continuing	Continuing
G-BOSS	WR	NSWC CRANE : CRANE, IN	0.000	0.000		1.800	Feb 2018	0.000		-		0.000	0.000	1.800	-
MSIDS	WR	SPAWAR : CHARLESTON, SC	0.000	0.000		0.171	Dec 2017	0.000		-		0.000	0.000	0.171	-
TRSS	WR	SPAWAR-A1 : CHARLESTON, SC	0.000	0.000		0.802	Dec 2017	0.000		-		0.000	0.000	0.802	-
Terrestrial Collection	WR	SPAWAR : CHARLESTON, SC	0.000	0.000		0.000		0.174	Dec 2018	-		0.174	Continuing	Continuing	Continuing
Terrestrial Collection	WR	NSWC CRANETC : CRANE, IN	0.000	0.000		0.000		1.227	Nov 2018	-		1.227	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	Project (Number/Name) 2272 / *Intel Command and Control (C2) 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
		Subtotal	9.783	4.742		8.492		8.685		-		8.685	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	84.168	22.978		30.886		33.501		-		33.501	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

CESAS II Program Schedule (Funded)

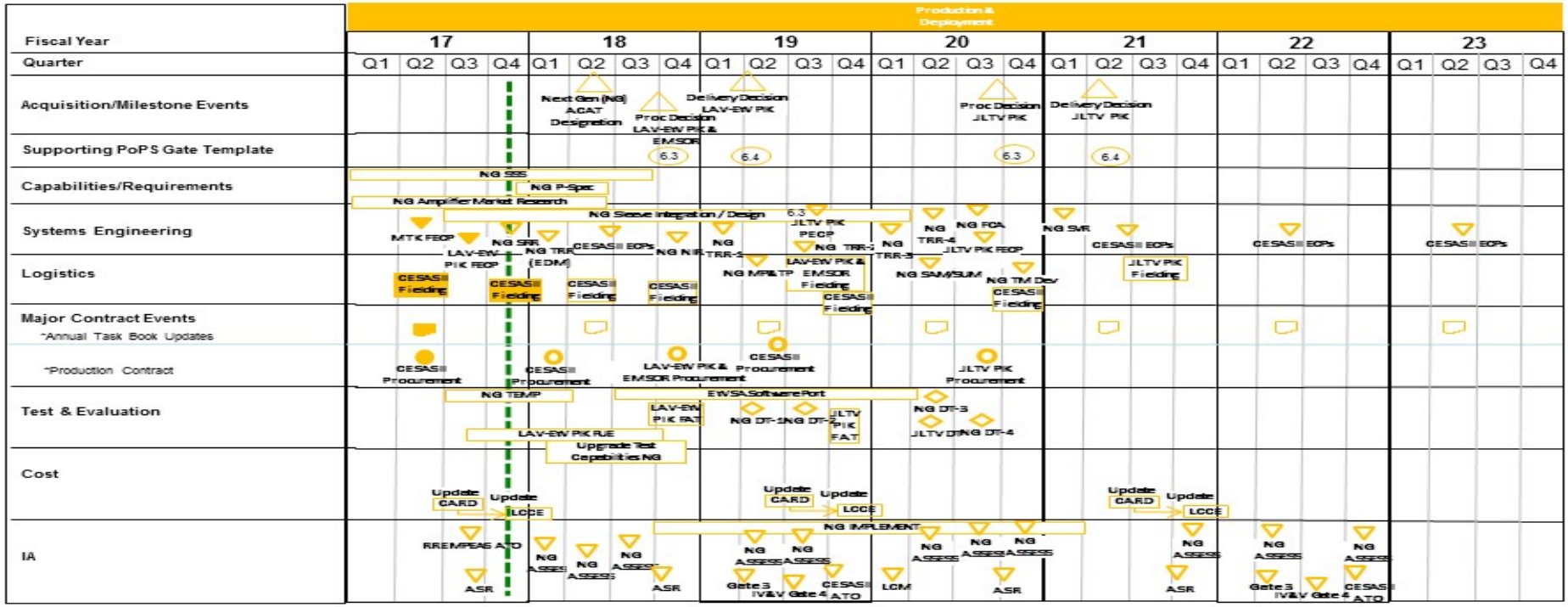
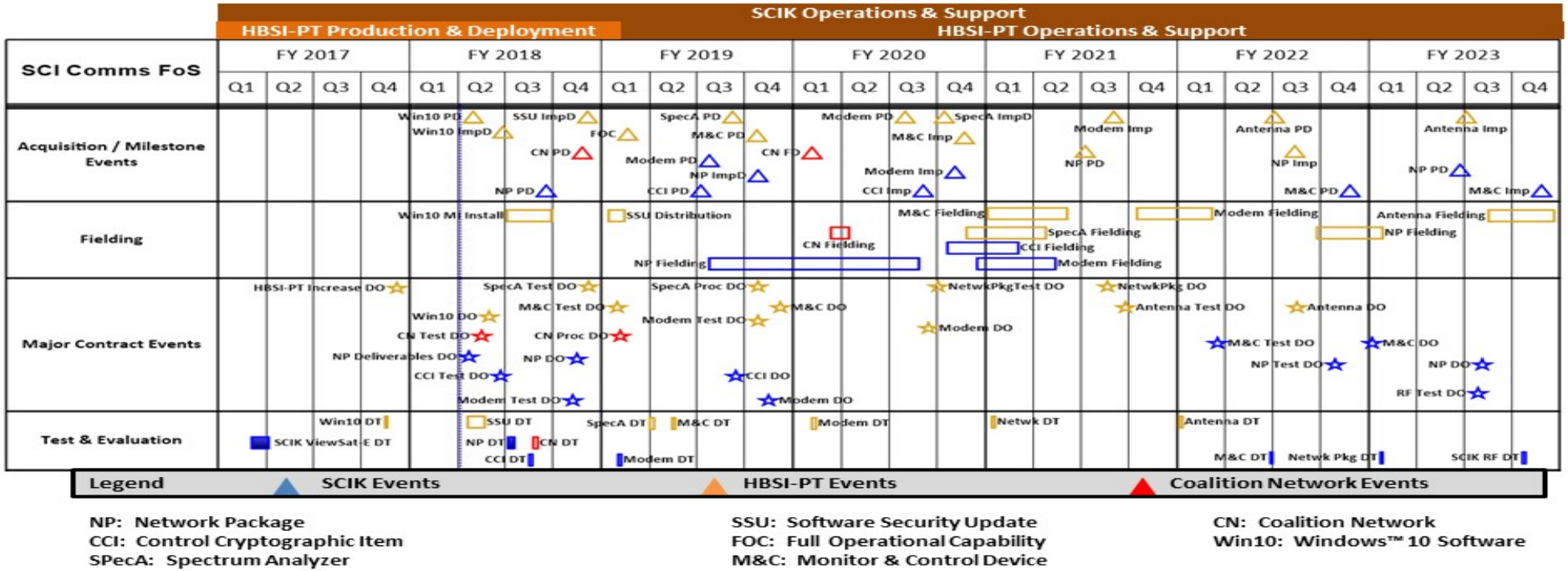


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

Sensitive Compartmented Information Communications Family of Systems (SCI Comms FoS)



NP: Network Package
CCI: Control Cryptographic Item
SPecA: Spectrum Analyzer

SSU: Software Security Update
FOC: Full Operational Capability
M&C: Monitor & Control Device

CN: Coalition Network
Win10: Windows™ 10 Software

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

TCAC Program Schedule

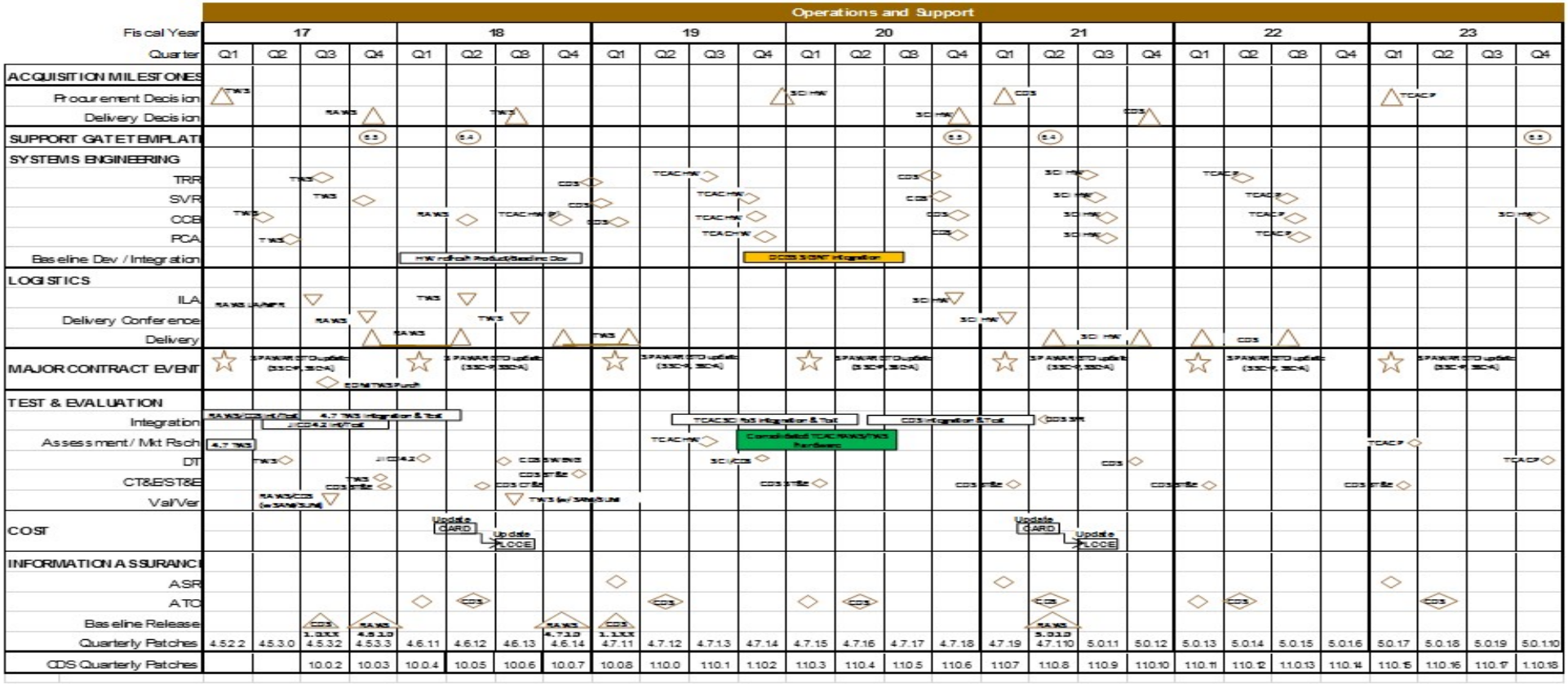


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

TSCS Program Schedule

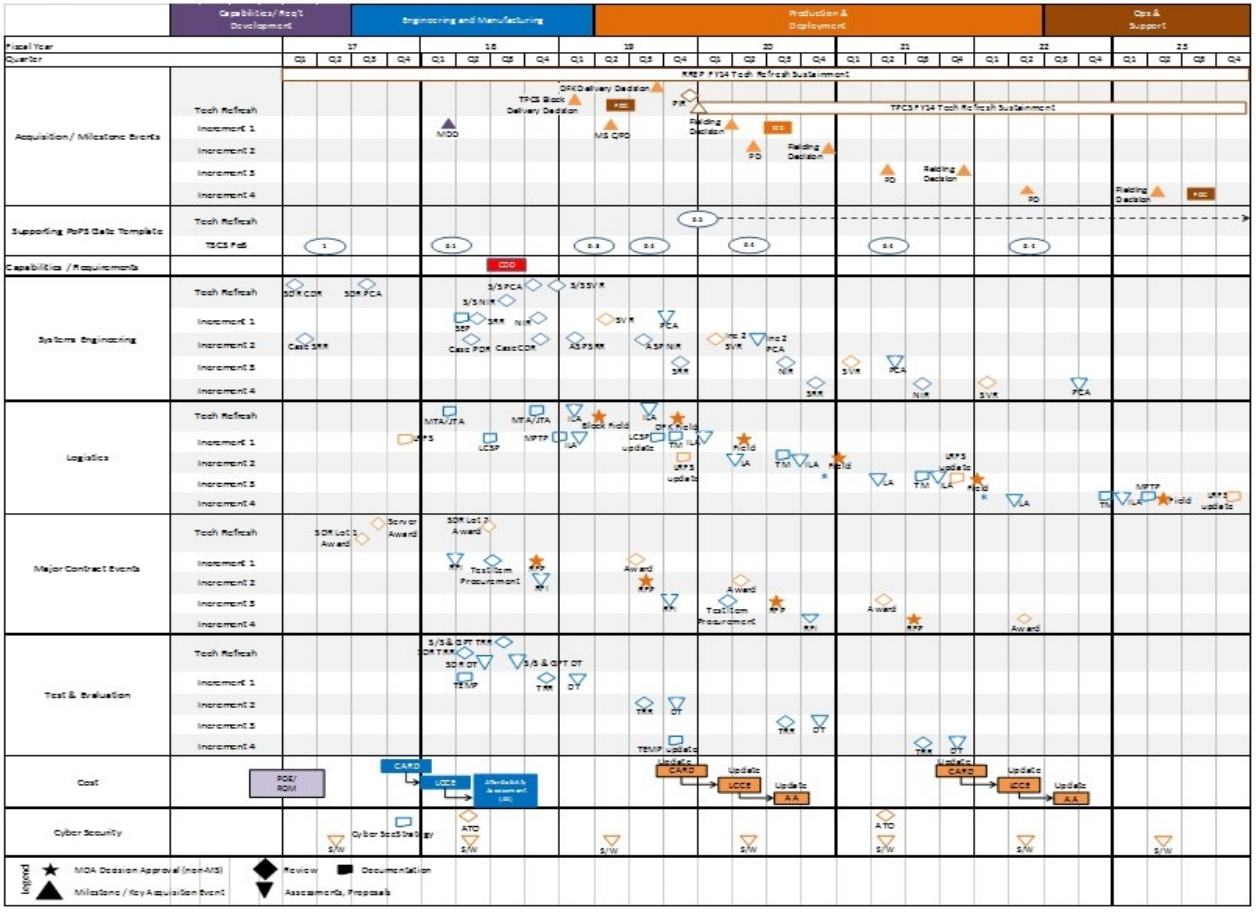


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

IBR Program Schedule

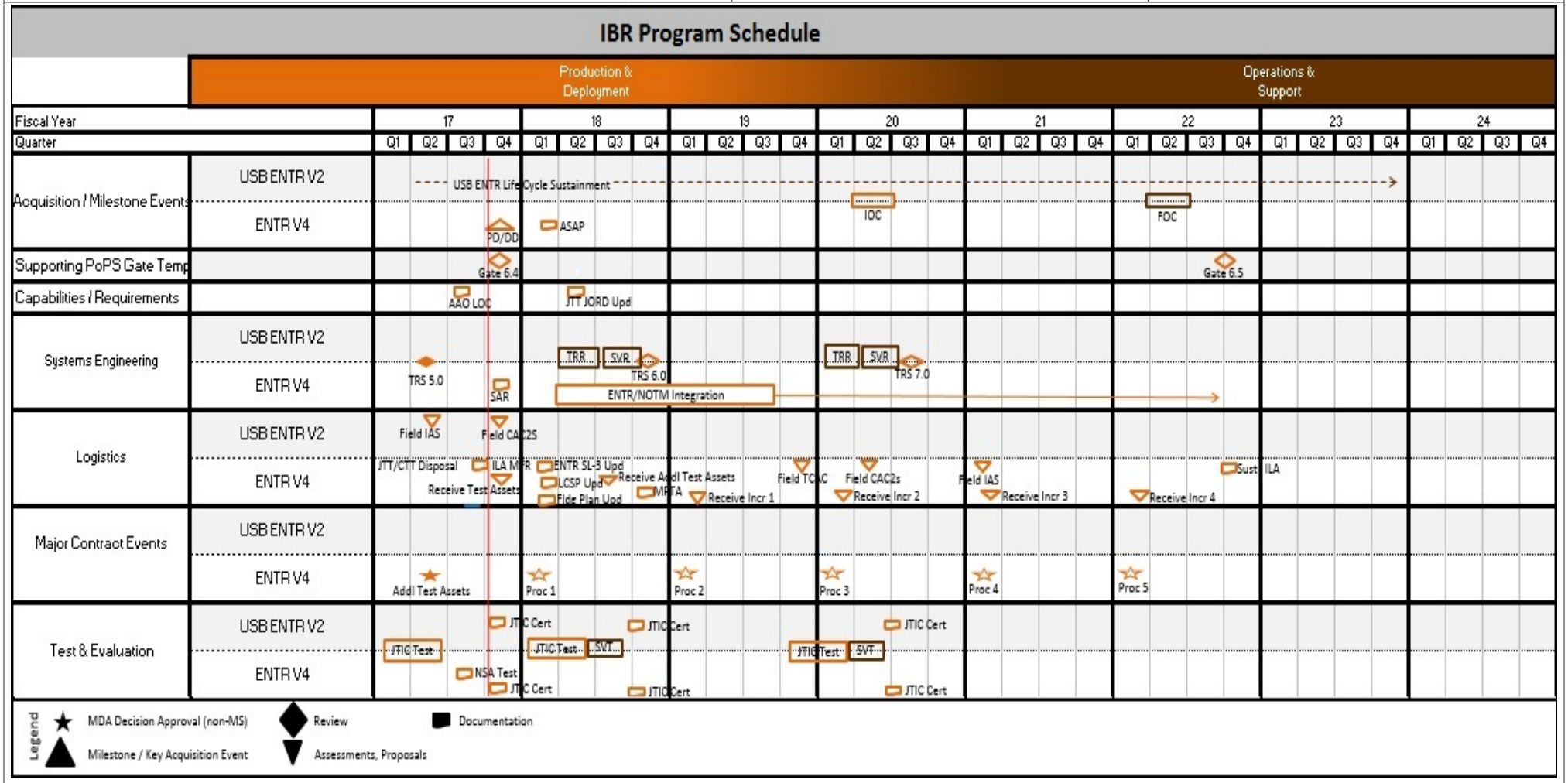


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

CIHEP FoS Program Schedule

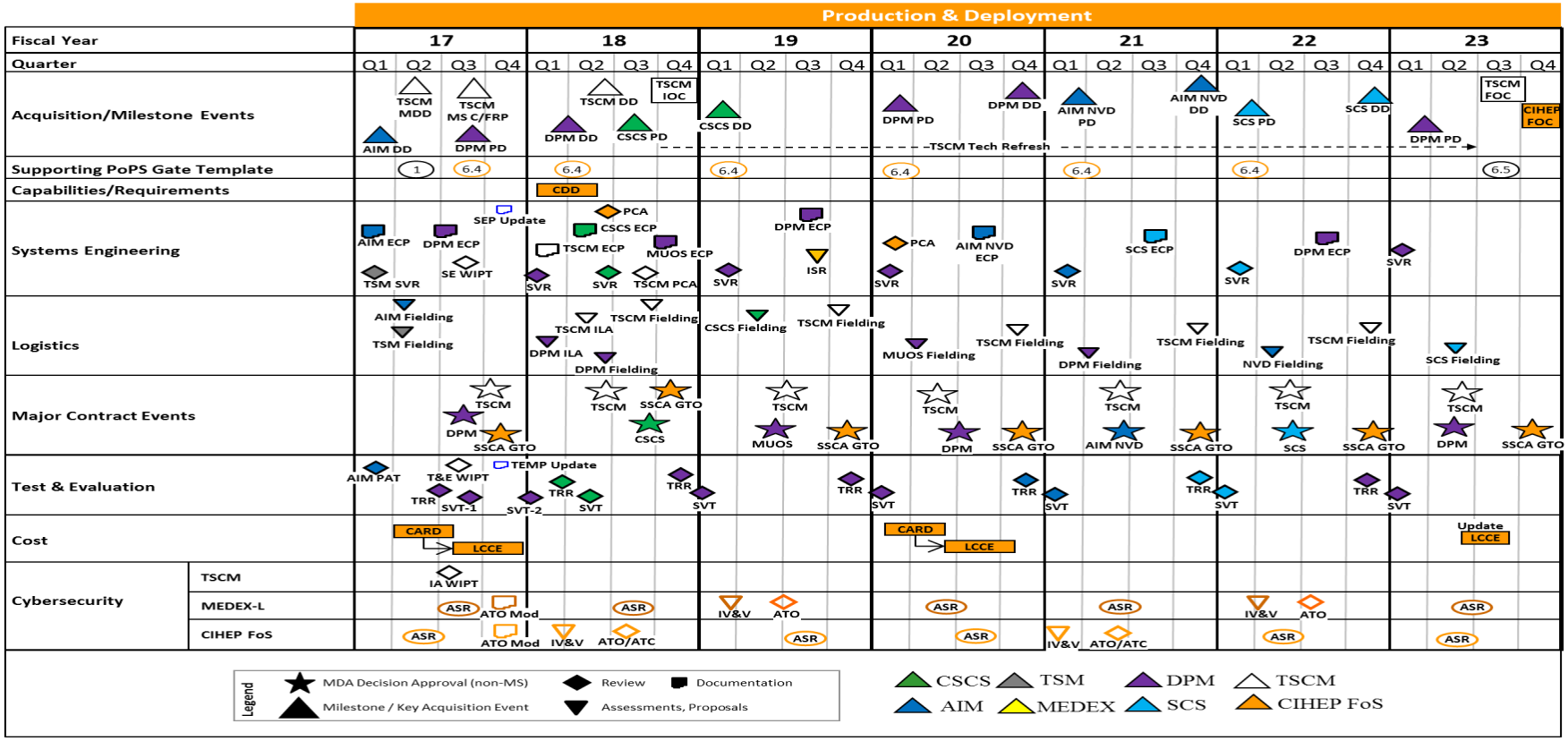
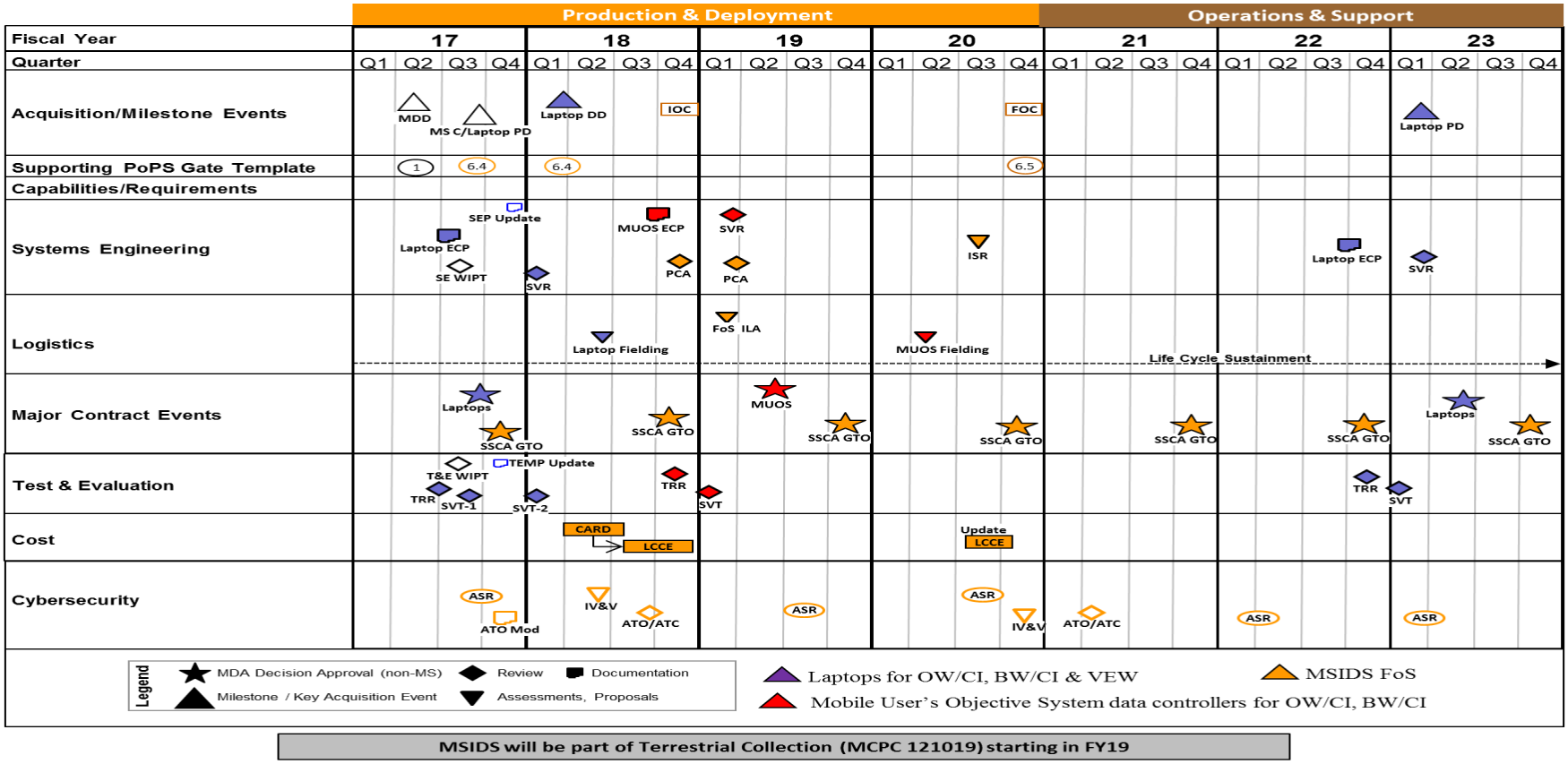


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

MSIDS FoS Program Schedule



MSIDS will be part of Terrestrial Collection (MCPC 121019) starting in FY19

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

TRSS SoS Program Schedule

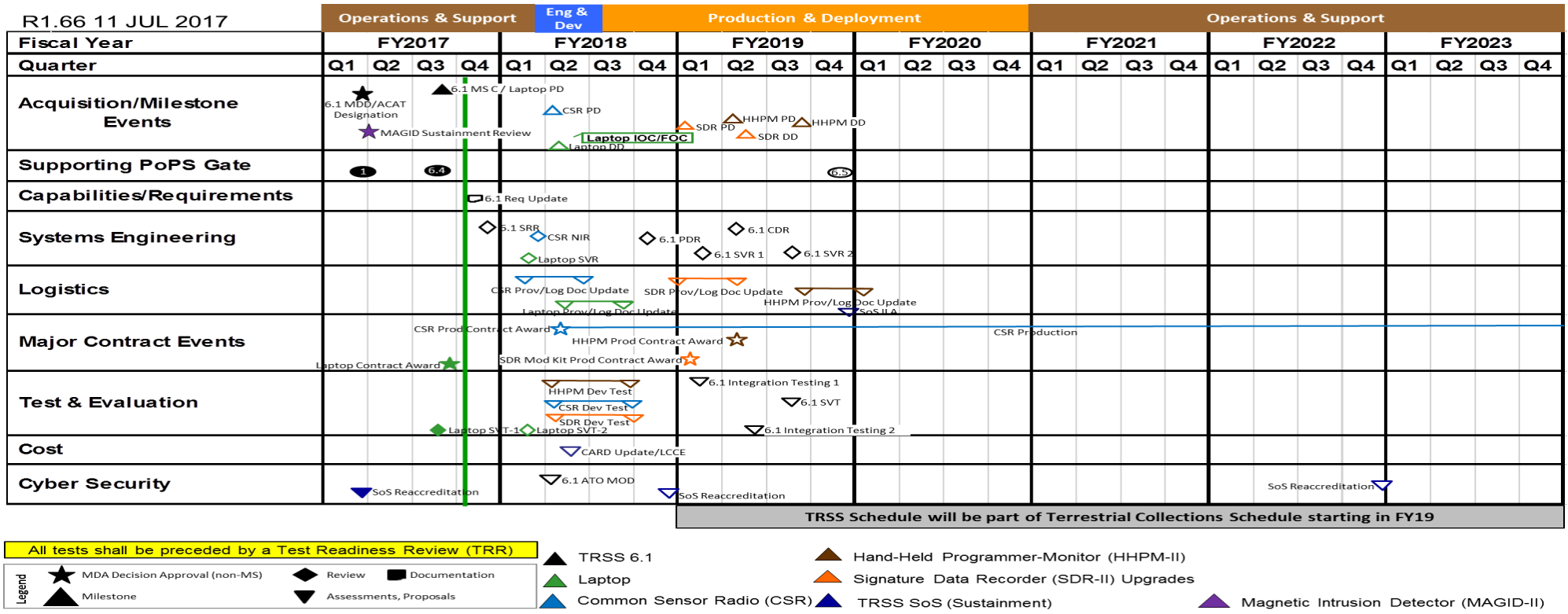


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

Terrestrial Collection Program Schedule

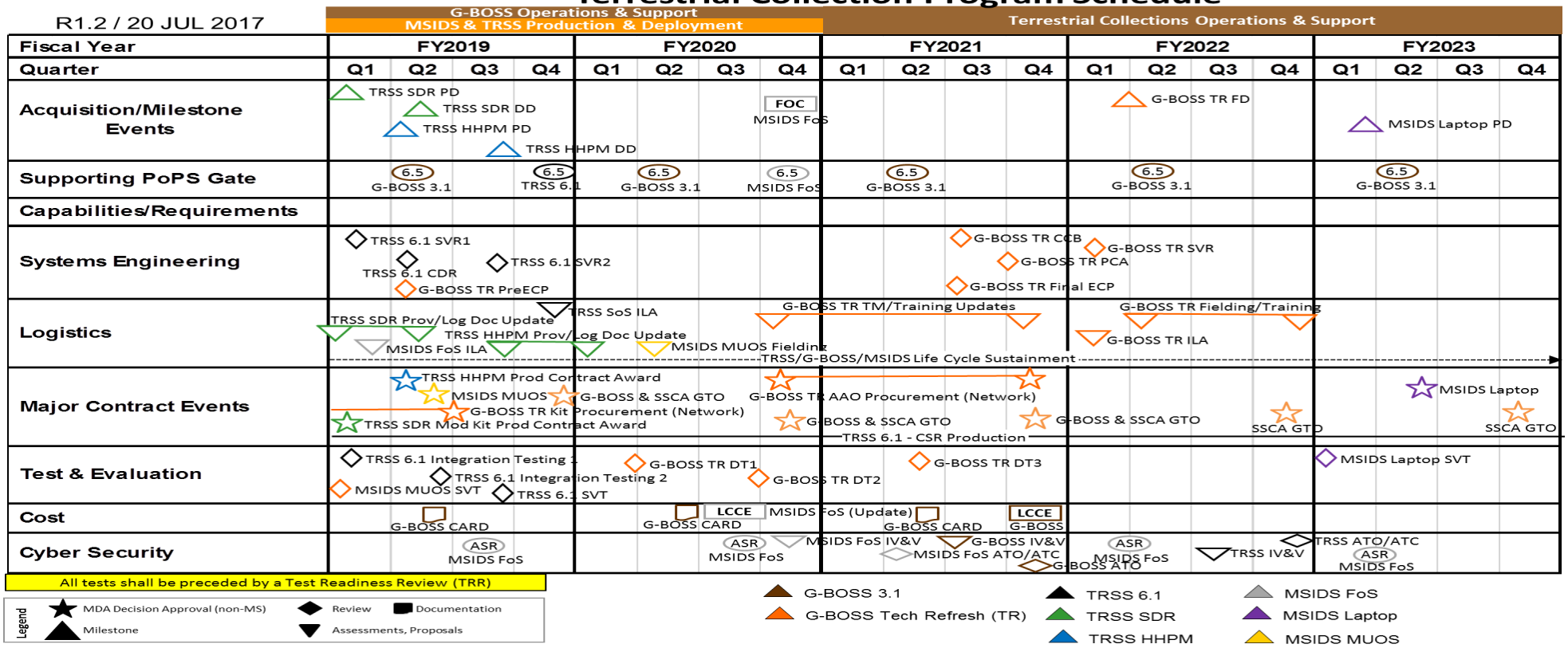
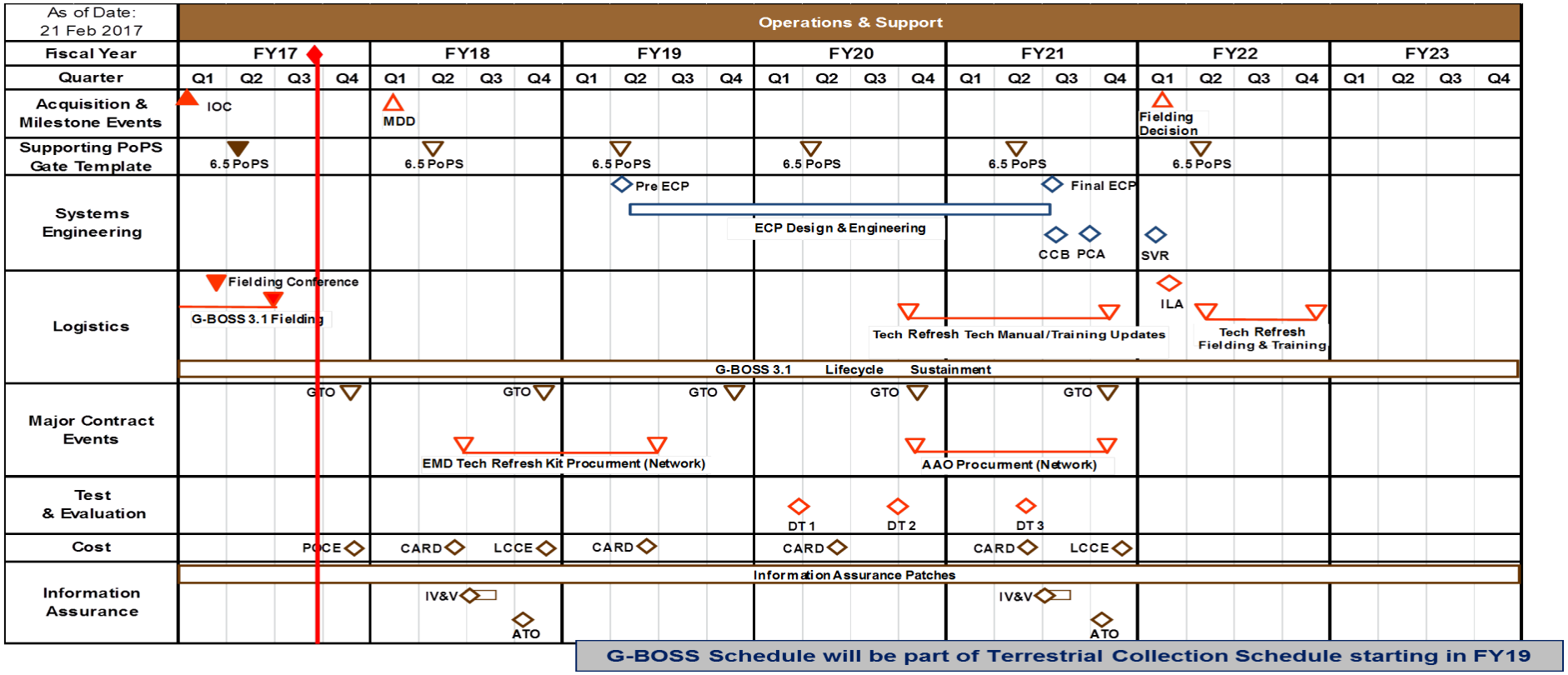


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

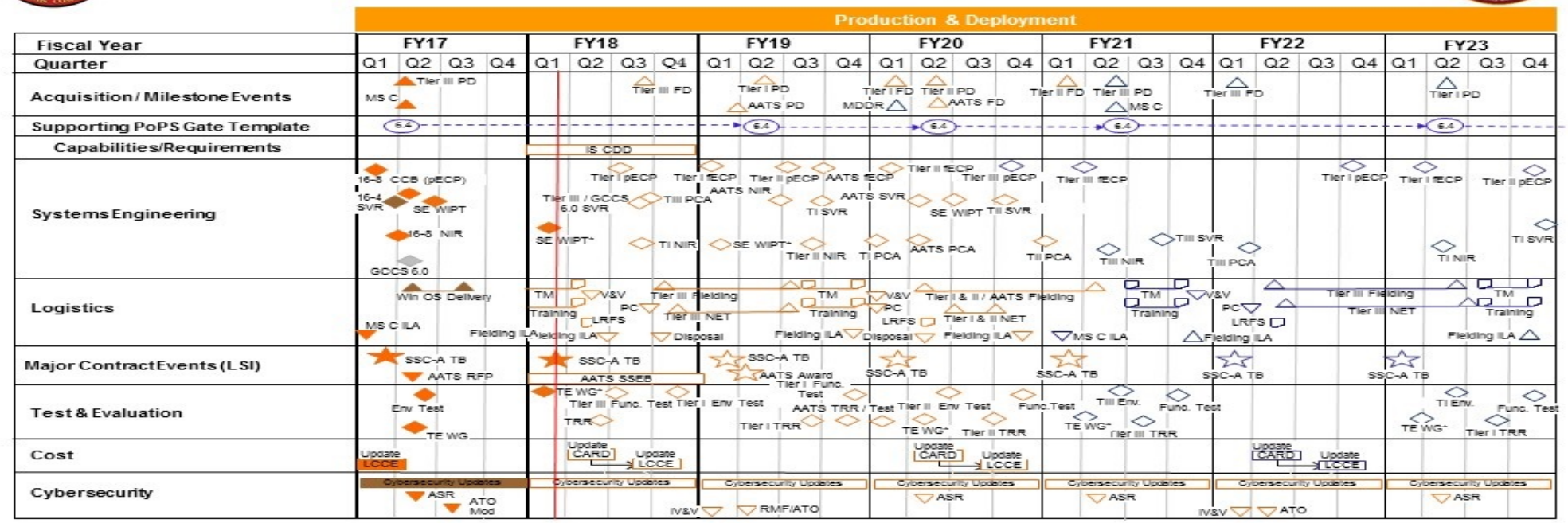
Schedule – G-BOSS



G-BOSS Schedule will be part of Terrestrial Collection Schedule starting in FY19

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

IAS FoS Program Schedule



*T&E WIPT conducted for tailored environmental testing SE WIPT conducted to review test results

Updated 20 Dec 17

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2272				
TCAC SCI HW Procurement Decision	4	2019	4	2019
IAS MS C Decision	2	2017	2	2017
IAS Advanced Analytics Production Decision	2	2019	2	2019
CESAS LAV-EW PIK and EMSOR Procurement Decision	3	2018	3	2018
CESAS LAV-EW PIK Delivery Decision	2	2019	2	2019
SCI COMMS FOC (HBSI-PT)	1	2019	1	2019
SCI COMMS Monitor & Control Device Test Asset Procurement	1	2019	1	2019
SCI COMMS SPEC A Procurement Decision	3	2019	3	2019
SCI COMMS Controlled Cryptographic Items Procurement Decision	3	2019	3	2019
SCI COMMS Modem Procurement Decision	3	2019	3	2019
SCI COMMS Monitor & Control Device Procurement Decision	4	2019	4	2019
CIHEP Technical Surveillance Countermeasures (TSCM) Material Development Decision	2	2017	2	2017
CIHEP Technical Surveillance Countermeasures (TSCM) Milestone C / FRP	3	2017	3	2017
CIHEP Data Processing Module (DPM) Procurement Decision	3	2017	3	2017
CIHEP Data Processing Module (DPM) Delivery Decision	1	2018	1	2018
CIHEP Technical Surveillance Countermeasures (TSCM) Delivery Decision	2	2018	2	2018
CIHEP Commercial Satellite Communications Set (CSCS) Production Decision	3	2018	3	2018
CIHEP Technical Surveillance Countermeasures (TSCM) IOC	4	2018	4	2018
CIHEP Commercial Satellite Communications Set (CSCS) Delivery Decision	1	2019	1	2019
IBR Procurement Decision / Delivery Decision (ENTR Version 4)	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 2272 / *Intel Command and Control (C2) Sys*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
IBR Initial Operational Capability (IOC) (ENTR Version 4)	2	2020	2	2020
IBR Full Operational Capability (FOC) (ENTR Version 4)	2	2022	2	2022
GBOSS IOC	1	2017	1	2017
GBOSS MDD	1	2018	1	2018
MSIDS MDD	2	2017	2	2017
MSIDS Milestone C / Production Decision (Laptops)	3	2017	3	2017
MSIDS Delivery Decision (Laptops)	1	2018	1	2018
MSIDS IOC	4	2018	4	2018
TRSS IOC/FOC SMG/SMG-LITE Components (Laptops)	2	2018	1	2019
Terrestrial Collection: G-BOSS Tech Refresh Development & Interoperability	1	2019	3	2019
Terrestrial Collection: TRSS Decision Signature Data Recorder (SDR) Procurement Decision	1	2019	1	2019
Terrestrial Collection: TRSS Hand Held Programmable Monitor (HHPM) Procurement Decision	2	2019	2	2019
Terrestrial Collection: TRSS Signature Data Recorder (SDR) Delivery Decision	2	2019	2	2019
Terrestrial Collection: TRSS Hand Held Programmable Monitor (HHPM) Delivery Decision	3	2019	3	2019
Terrestrial Collection: MSIDS FOC	4	2020	4	2020
TSCS Procurement Decision (Increment 1)	2	2019	2	2019
TSCS Contract Award (Increment 1)	3	2019	3	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	Project (Number/Name) 3771 / *Tactical Exploitation of National Capabilities (TENCAP)*	

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
3771: *Tactical Exploitation of National Capabilities (TENCAP)*	0.000	0.000	0.000	6.475	-	6.475	6.484	6.594	6.731	6.869	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Beginning in FY19, TENCAP funding has been realigned from project 2272 to 3771, Tactical Exploitation of National Capabilities. Realignment of efforts to new BLIs in FY 19 and beyond reflects USMC Program Management Office (PMO) reorganization to improve support of USMC OPFOR.

A. Mission Description and Budget Item Justification

Tactical Exploitation of National Capabilities (TENCAP) exploits current national reconnaissance systems and programs by examining both technical and operational capabilities, implementing training, and sponsoring concept demonstrations to directly support Marine Corps operating forces. The goal is to pursue technologies which exploit data from national systems to enhance intelligence support to the Marine Air-Ground Task Force (MAGTF) and/or the supported Joint Task Force commander.

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 Exploitation of National Capabilities (TENCAP): Product Development & Technical Assessments	0.000	0.000	6.475	0.000	6.475
Articles:	-	-	-	-	-
FY 2018 Plans: Refer to Project: 2272; TENCAP will be funded in 2272 in FY18.					
FY 2019 Base Plans: - Continue to conduct research and development, advanced technology demonstrations, and integration of emerging technologies into the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE). - Continue to support the Congressionally mandated TENCAP office and all associated ongoing activities, to include the coordination with national agencies, the intelligence community, research laboratories, private industry, and academia, for exploration of collaborative Science and Technology (S&T)/R&D efforts to bring evolutionary intelligence capabilities to the operating forces. - Continue to provide technical assessments and field utility evaluations for the integration of current and emerging intelligence capabilities into the tactical decision making process. - Continue to support operational planning and enhance operating force capabilities through the identification and development of advanced technologies for the MCISRE architecture.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 3771 / *Tactical Exploitation of National Capabilities (TENCAP)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue training and education efforts by providing the operating forces with supported simulation, visualization, and improved mission planning capabilities. - Continue efforts to provide transition support to Rapid Reliable Targeting (RRT). - Initiate development, integration, and FUE of innovative national data receipts and dissemination capabilities from insertion into MCISRE. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The $6.475M increase from FY18 to FY19 reflects the move from Project 2272 to 3371. The actual increase from FY18 ($6.448M) to FY19 ($6.475M) is $0.027M which will be used for additional technical assessments.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	6.475	0.000	6.475

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

(U) TENCAP: All work will be led in-house and necessary contractor support will be acquired using existing contracts. Research, test and integrate new technology and conduct advanced technology demonstrations to identify the most appropriate programs which are mature for integration of emerging technologies into the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISR-E).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 3771 / *Tactical Exploitation of National Capabilities (TENCAP)*

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
TENCAP	C/CPFF	DTIC : FT BELVOIR, VA	0.000	0.000		0.000		6.025	Nov 2018	-		6.025	Continuing	Continuing	Continuing
TENCAP	WR	SSCLANT : CHARLESTON, SC	0.000	0.000		0.000		0.450	Oct 2018	-		0.450	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		6.475		-		6.475	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		6.475		-		6.475	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 3771 / *Tactical Exploitation of National Capabilities (TENCAP)*

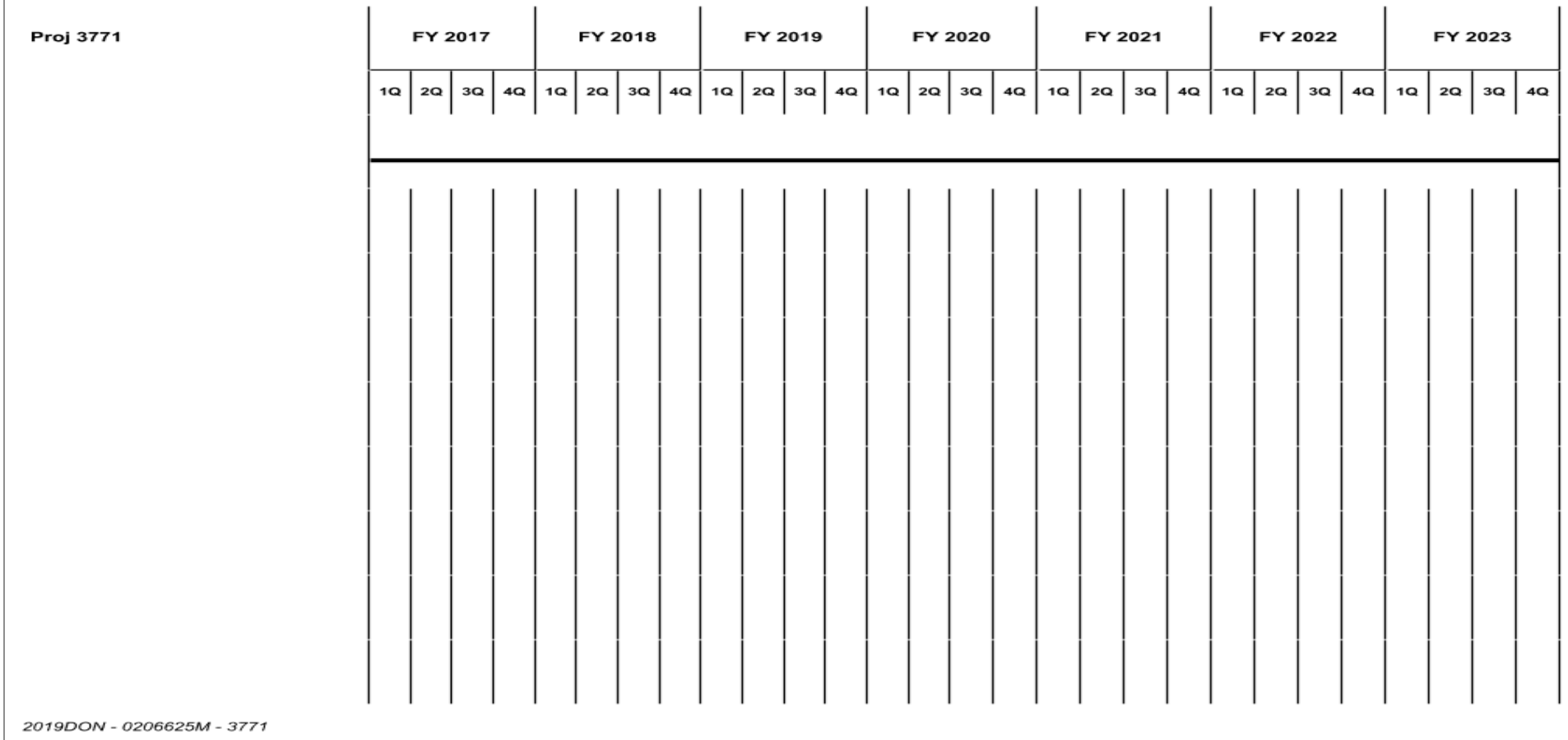


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206625M / *USMC Intelligence/ Electronics Warfare Sys*	**Project (Number/Name)** 3771 / *Tactical Exploitation of National Capabilities (TENCAP)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3771				
Continued RDTEN of new and emerging tech into MCISRE	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0206629M *I (U)Amphibious Assault 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**
Total Program Element	129.181	36.571	58.728	22.637	-	22.637	15.708	7.163	5.768	6.049	Continuing	Continuing
2938: *Amphibious Assault Vehicle*	129.181	36.571	58.728	22.637	-	22.637	15.708	7.163	5.768	6.049	Continuing	Continuing

Note

NOTE: Prior funding is reflected in P.E. 0206623M/Project 0021.

A. Mission Description and Budget Item Justification

The Assault Amphibious Vehicle (AAV) program provides life-cycle support to ensure cost-effective combat readiness for the AAV Family of Vehicles (FOV). This is accomplished through engineering changes resulting from continuous review of sub-systems to maintain system supportability, safety, reduce total ownership costs, improve fleet readiness, address obsolescence issues, and improve vehicle survivability and performance. The AAV program also includes a survivability upgrade which will increase P-Variant and C-Variant survivability and force protection while maintaining the required land and water mobility performance.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	38.020	58.728	26.810	-	26.810
Current President's Budget	36.571	58.728	22.637	-	22.637
Total Adjustments	-1.449	0.000	-4.173	-	-4.173
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.561	0.000			
• SBIR/STTR Transfer	-0.888	0.000			
• Program Adjustments	0.000	0.000	-3.845	-	-3.845
• Rate/Misc Adjustments	0.000	0.000	-0.328	-	-0.328

Change Summary Explanation

The FY 2019 funding request was reduced by ($3.845) million to account for the availability of prior year execution balances.

The decrease from FY18 to FY19 ($36.091M) represents the transition of AAV's Survivability Upgrade into the final year of P (Personnel)-variant testing. P-variant Initial Operational Test and Evaluation efforts (IOT&E), Full-Up System Level testing (FUSL) and developmental efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) will be complete in FY19. The decrease also reflects the transition from P-variant Engineering 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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0206629M *I (U)Amphibious Assault Vehicle*

Manufacturing Development (EMD) to C (Command)-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0206629M / *(U)Amphibious Assault Vehicle*	Project (Number/Name) 2938 / *Amphibious Assault 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
2938: *Amphibious Assault Vehicle*	129.181	36.571	58.728	22.637	-	22.637	15.708	7.163	5.768	6.049	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The decrease from FY18 to FY19 ($36.091M) represents the transition of AAV's Survivability Upgrade into the final year of P (Personnel)-variant testing. P-variant Initial Operational Test and Evaluation efforts (IOT&E), Full-Up System Level testing (FUSL) and developmental efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) will be complete in FY19. The decrease also reflects the transition from P-variant Engineering and Manufacturing Development (EMD) to C (Command)-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing.

The FY 2019 funding request was reduced by $3.845M to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

The Assault Amphibious Vehicle (AAV) program provides life-cycle support to ensure cost-effective combat readiness for the AAV Family of Vehicles (FOV). This is accomplished through engineering changes resulting from continuous review of sub-systems to maintain system supportability, safety, reduce total ownership costs, improve fleet readiness, address obsolescence issues, and improve vehicle survivability and performance. The AAV program also includes a survivability upgrade which will increase P-Variant and C-Variant survivability and force protection while maintaining the required land and water mobility performance.

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	30.268	29.341	5.543	0.000	5.543
Articles:	4	3	-	-	-
Description: AAV Survivability Upgrade will improve the legacy AAV Force Protection capability. Improvements include improved underbelly protection, integrated blast mitigating seats, integrated spall liners, protected fuel storage, sponson armor, and selected improvements to maintain required water and land mobility. AAV modifications will provide Nonrecurring Engineering (NRE) and design for AAV safety, obsolescence, and performance improvement engineering change proposals.					
FY 2018 Plans: -Continue nonrecurring efforts for design, development, integration, and test for legacy vehicle Electrical Modernization.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206629M / *(U)Amphibious Assault Vehicle*	**Project (Number/Name)** 2938 / *Amphibious Assault Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
-Complete integration and engineering analyses for Amphibious Remote Weapon Station (ARWS). -Initiate prime contractor Reliability Growth Test and Production Configuration Model (formerly FUSL) test support for Survivability Upgrade. -Procure three (3) C-variant Engineering Change Proposal (ECP) Production test items. -Initiate efforts in Hydraulic Modernization and R-variant improvements for Survivability Upgrade. ***FY 2019 Base Plans:*** -Complete nonrecurring efforts for design, development, integration, and test for legacy vehicle Electrical Modernization. -Complete efforts in R-variant improvements for Survivability Upgrade. -Initiate C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY18 to FY19 ($23.798M) is due to Survivability Upgrade (SU) transitioning into the final year of P-variant contractor development and testing. The decrease also reflects the transition from P-variant Engineering and Manufacturing Development (EMD) to C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing.					
Title: Support	1.569	3.666	2.604	0.000	2.604
Articles:	-	-	-	-	-
Description: Provide government engineering and technical support for AAV safety, obsolescence, and performance modifications, and Survivability Upgrade support. ***FY 2018 Plans:*** - Continue Electrical Modernization, and Command and Control (C2) systems modernization. - Continue to provide technical and engineering services in support of AAV obsolescence and performance modifications. - Continue to provide material and travel associated with these efforts. ***FY 2019 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206629M / *(U)Amphibious Assault Vehicle*	**Project (Number/Name)** 2938 / *Amphibious Assault Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Continue Electrical Modernization, and Command and Control (C2) systems modernization. - Continue to provide technical and engineering services in support of AAV obsolescence and performance modifications. - Continue to provide material and travel associated with these efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY18 to FY19 ($1.062M) reflects a reduction to engineering management and technical support for systems integration because of the transition from AAV SU P-variant EMD to C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM) testing.					
Title: Test and Evaluation	3.644	21.240	11.411	0.000	11.411
Articles:	-	-	-	-	-
Description: Developmental, Operational and Live Fire Test and Evaluation of safety improvements, upgrades, modifications and fact of life changes to ensure operational suitability and effectiveness of the AAV family of vehicles. ***FY 2018 Plans:*** - Initiate Full-Up System Level (FUSL) testing for Survivability Upgrade. - Initiate Developmental Testing (DT) efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) for Survivability Upgrade. - Initiate Developmental, Live Fire, and Operational Testing for Amphibious Remote Weapon Station (ARWS). ***FY 2019 Base Plans:*** - Complete P-variant Full-Up System Level (FUSL) testing for Survivability Upgrade. - Complete P-variant Developmental Testing (DT) efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) for Survivability Upgrade. - Complete Developmental, Live Fire, and Operational Testing for Amphibious Remote Weapon Station (ARWS). - Initiate and complete Initial Operational Test and Evaluation (IOT&E) in support of the P-variant Survivability Upgrade. - Initiate Full-Up System Level (FUSL) testing for C-variant. - Initiate Live Fire Test and Evaluation (LFT&E) for C-variant.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206629M / *(U)Amphibious Assault Vehicle*	**Project (Number/Name)** 2938 / *Amphibious Assault Vehicle*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate Developmental Testing efforts for Production Qualification Testing (PQT) for C-variant. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY18 to FY19 ($9.829M) for Testing reflects the completion of Reliability Growth Testing (RGT) in FY18. Decrease also reflects completion in FY19 of Full-Up System Level (FUSL) testing and Developmental Testing efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) for P-variant that began in FY18.					
Title: Management and Engineering Technical Services	1.090	4.481	3.079	0.000	3.079
Articles:	-	-	-	-	-
Description: Management support services and technical support for program office and field activities. ***FY 2018 Plans:*** - Continue program management services in support of ECP development, trade studies and analyses, supply chain and government property management in support of AAV sustainment modification efforts. - Initiate non-recurring logistic support for systems integration. ***FY 2019 Base Plans:*** - Continue program management services in support of ECP development, trade studies and analyses, supply chain and government property management in support of AAV sustainment modification efforts. - Continue non-recurring logistic support for systems integration. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease from FY18 to FY19 ($1.402M) in In-House Technical Support reflects less engineering and technical support required as Survivability Upgrade enters the final year of test for the P-variant.					
Accomplishments/Planned Programs Subtotals	36.571	58.728	22.637	0.000	22.637

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206629M / *(U)Amphibious Assault Vehicle*	**Project (Number/Name)** 2938 / *Amphibious Assault 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
• PMC/2021: *AAV Product Improvement Program*	69.785	107.665	156.249	-	156.249	186.723	211.228	222.061	37.943	22.296	2,009.633

Remarks

D. Acquisition Strategy

The USMC competitively awarded two contracts in FY 2014 for development efforts in support of upgrading 392 Personnel-variant (P-Variant) Assault Amphibious Vehicles. Down-select to one contractor for manufacture of prototype vehicles occurred in February 2015. Subsequently, the requirement was increased to upgrading 405 Assault Amphibious Vehicles including the Command-Variant (C-Variant). The program's main focus is on improving Marine force protection capabilities. To support the required capabilities, the Survivability Upgrade program will seek to incorporate Non-Developmental Items (NDI) and/or Commercial off the Shelf (COTS) solutions into the existing P-Variant and C-Variant Reliability, Availability, Maintainability/Rebuild to Standard (RAM/RS) configuration of AAV. The acquisition strategy seeks to minimize cost and schedule, and maximize value, technology readiness, and commonality, while ensuring the selected manufacturer meets the capability attributes established for the RAM/RS. RDT&E funded competitive designs and contract options for Engineering and Manufacturing Development (EMD). Initial Operational Capability (IOC) is scheduled for FY 2019.

E. Performance Metrics

Milestone Reviews:
Initial Operational Capability (IOC): 3rd quarter 2019
Full Rate Production (FRP) decision: 3rd quarter 2019

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206629M / *(U)Amphibious Assault Vehicle*	**Project (Number/Name)** 2938 / *Amphibious Assault 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
Syst Design & Dev / EMD	C/FFP	MCSC : Quantico, VA	82.476	28.228	Aug 2017	17.864	Feb 2018	4.336	Feb 2019	-		4.336	Continuing	Continuing	Continuing
Other Product Development	C/BA	Various : Various	3.105	2.040	Mar 2017	11.476	Mar 2018	1.207	Mar 2019	-		1.207	Continuing	Continuing	Continuing
		Subtotal	85.581	30.268		29.340		5.543		-		5.543	Continuing	Continuing	N/A

Remarks

The decrease from FY18 to FY19 ($23.797M) is due to Survivability Upgrade (SU) transitioning into the final year of contractor development and testing for the P-variant. The decrease also reflects the transition from P-variant Engineering and Manufacturing Development (EMD) to C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM).

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
Travel	Various	Various : Various	0.492	0.286	Oct 2016	0.249	Oct 2017	0.047	Oct 2018	-		0.047	Continuing	Continuing	Continuing
In-House Technical Support	Various	Various : Various	16.246	1.283	Feb 2017	3.418	Feb 2018	2.557	Feb 2019	-		2.557	Continuing	Continuing	Continuing
		Subtotal	16.738	1.569		3.667		2.604		-		2.604	Continuing	Continuing	N/A

Remarks

The decrease from FY18 to FY19 ($1.063M) reflects a reduction to engineering management and technical support for nonrecurring test and evaluation and logistic support for systems integration because of the transition from AAV SU P-variant EMD to C-variant Production Qualification Testing (PQT), Live Fire Test & Evaluation (LFT&E), Full Up System Level Testing (FUSL), and Reliability, Availability, Maintainability (RAM).

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 (DT)	Various	Various : Various	5.220	2.171	Nov 2016	10.793	Feb 2018	2.355	Feb 2019	-		2.355	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206629M / *(U)Amphibious Assault Vehicle*	**Project (Number/Name)** 2938 / *Amphibious Assault 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
Operational Testing (OT)	WR	MCOTEA : Quantico, VA	1.022	0.000		7.965	Mar 2018	5.965	Mar 2019	-		5.965	Continuing	Continuing	Continuing
Live Fire Test and Evaluation (LFT&E)	Various	Various : Various	2.173	1.473	Mar 2017	2.482	Mar 2018	3.091	Mar 2019	-		3.091	Continuing	Continuing	Continuing
		Subtotal	8.415	3.644		21.240		11.411		-		11.411	Continuing	Continuing	N/A

Remarks

The decrease from FY18 to FY19 ($9.829M) for Testing reflects the completion of Reliability Growth Testing (RGT) in FY18. Decrease also reflects completion in FY19 of Full-Up System Level (FUSL) testing and Developmental Testing efforts for Production Qualification Testing/Reliability Qualification Testing (PQT/RQT) for the P-variant that began in FY18.

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 Svcs	C/FFP	MCSC : Quantico, VA	6.802	0.000	Apr 2017	1.826	Apr 2018	1.996	Apr 2019	-		1.996	Continuing	Continuing	Continuing
Engineering and Technical Services	Various	Various : Various	11.645	1.090	Mar 2017	2.655	Mar 2018	1.083	Mar 2019	-		1.083	Continuing	Continuing	Continuing
		Subtotal	18.447	1.090		4.481		3.079		-		3.079	Continuing	Continuing	N/A

Remarks

The decrease from FY18 to FY19 ($1.402M) in In-House Technical Support reflects less engineering and technical support required as Survivability Upgrade P-variant enters the final year of 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	129.181	36.571		58.728		22.637		-		22.637	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206629M / *(U)Amphibious Assault Vehicle*	**Project (Number/Name)** 2938 / *Amphibious Assault Vehicle*

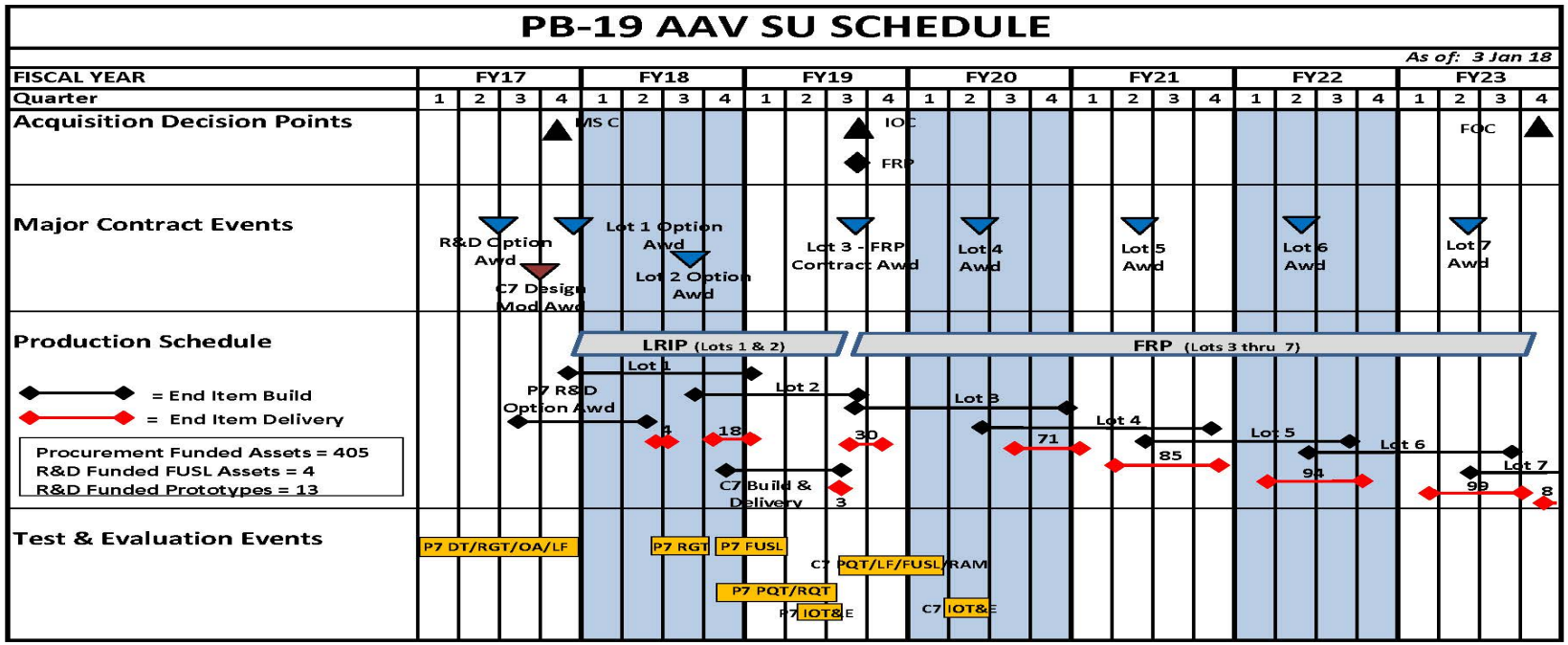


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0206629M / *(U)Amphibious Assault Vehicle*	**Project (Number/Name)** 2938 / *Amphibious Assault Vehicle*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2938				
MS C for Survivability Upgrade	4	2017	4	2017
LRIP Lot 1 for P-variant Survivability Upgrade	4	2017	1	2019
LRIP Lot 2 for P-variant Survivability Upgrade	3	2018	3	2019
Developmental Test and Evaluation/Production Qualification Testing/Reliability Testing (PQT/RQT) for P-variant Survivability Upgrade	4	2018	3	2019
Full-Up System Level Testing (FUSL) for P-variant Survivability Upgrade	4	2018	2	2019
IOT&E for P-variant Survivability Upgrade	2	2019	3	2019
Full Rate Production for Survivability Upgrade	3	2019	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0207161N *I Tactical Aim Missiles*							
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	424.073	54.678	42.884	40.121	-	40.121	20.053	7.571	0.424	0.446	0.000	590.250
0457: *AIM-9X*	424.073	54.678	42.884	40.121	-	40.121	20.053	7.571	0.424	0.446	0.000	590.250
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 442												

A. Mission Description and Budget Item Justification

The AIM-9X (Sidewinder) short-range air-to-air missile is a long term evolution of the AIM-9 series of fielded missiles. The AIM-9X missile program provides a launch and leave, air combat munition that uses passive infrared (IR) energy for acquisition and tracking of enemy aircraft and complements the Advanced Medium Range Air-to-Air Missile (AMRAAM). Air superiority in the short-range air-to-air missile arena is essential and includes first shot, first kill opportunity against an enemy employing IR countermeasures. The AIM-9X employs several components common with the AIM-9M (fuze, rocket motor and warhead). Anti-Tamper features have been incorporated to protect improvements inherent in this design. AIM-9X is a Post Milestone C, Acquisition Category IC joint service program with Navy lead.

The Block II program has completed independent operational testing and found to be operationally effective and operational/suitable. The program achieved Navy Initial Operational Capability (IOC) in March 2015 and received Full Rate Production decision in August 2015. The first Full Rate Production Lot contract was awarded in September 2015. This budget line will continue technical refresh of critical obsolete components, implement cost reduction initiatives, improve insensitive munitions performance, correct deficiencies, and increase capabilities through software enhancements, and conduct testing to ensure platform integration onto threshold US Navy aircraft.

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. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	56.285	42.884	33.458	-	33.458
Current President's Budget	54.678	42.884	40.121	-	40.121
Total Adjustments	-1.607	0.000	6.663	-	6.663
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.607	0.000			
• Rate/Misc Adjustments	0.000	0.000	6.663	-	6.663

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0207161N *I Tactical Aim Missiles*

Change Summary Explanation

The FY 2019 funding request was reduced by $0.097 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 increase in Rate/Misc Adjustments is associated with continuing the development and testing of the missile processor and Instrumented Measurement Unit (IMU) to avoid obsolescence.

Schedule:

1. SIP III Missile software version 9.4 Integration Testing (IT-D1) has been extended 12 months due to software design and software development challenges. Additional time is required to verify performance thresholds of the performance specification, and to verify the AIM-9X Block II missile system is ready for Follow-On Operational Test and Evaluation (FOT&E, OT-D1).
2. Operational Test Readiness Review (OTRR) as well as Operation Testing OT-D1 start date has been extended 12 months to share results with DT and minimize program cost.
3. The Lot 17 Hardware Engineering Change Proposal (ECP) cut-in date has been extended 3 months due to AIM-9X Block II+ reliability issues discovered during production qualification.
4. The SIP III hardware Critical Design Review (CDR) has been extended 8 months due to allow for additional time to redesign the guidance unit processor.
5. The Production Delivery schedule has been adjusted by 3 months to allow additional time required to obtain AIM-9X Block II parts for production.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0207161N / *Tactical Aim Missiles*	Project (Number/Name) 0457 / *AIM-9X*	

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
0457: *AIM-9X*	424.073	54.678	42.884	40.121	-	40.121	20.053	7.571	0.424	0.446	0.000	590.250
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 442

A. Mission Description and Budget Item Justification

AIM-9X is a long-term evolution of the AIM-9, a fielded system, qualifying this as a research category operational systems development. The AIM-9X short range air-to-air missile modification program provides a launch and leave, air combat munition that uses passive Infra-Red (IR) energy for acquisition and tracking of enemy aircraft and complements the Advanced Medium Range Air-to-Air Missile (AMRAAM). Air superiority in the short range air-to-air missile arena is essential and includes first shot, first kill opportunity against an enemy employing IR countermeasures. The AIM-9X employs several components common with the AIM-9M (fuze, rocket motor and warhead). The AIM-9X Block II missile is critical to project power and win decisively in accordance with the Fiscal Year 2015 Defense Planning Guidance and Navy's Navigation Plan 2015 - 2019. The missile is essential to Pacific Command plans to counter threats employed by advanced Digital Radio Frequency Memory (DRFM) electronic attack, cruise missiles, and Unmanned Aerial Vehicles.

This line item continues Technical Refresh of components and software, as well as incorporates advanced development products and capabilities, to meet threshold requirements of the capabilities production document. Specifically, the program will redesign, develop and integrate components facing obsolescence, implement cost reduction initiatives, enhance insensitive munitions performance, incrementally improve operational flight software to fully utilize capabilities of the missile, and improvements in anti-tamper and cyber security technology.

The program strategy is to first redesign the control actuation system (CAS) battery, along with the AIM-9X Block II Plus (AIM-9X-3) and incorporate it into the Lot 17 (FY 2017) production missile. Next, the program will complete missile software improvements (software version 9.4) and release it into Lot 19 (FY 2019) and prior missiles. The software will provide improved infrared counter-countermeasures, partial and degraded cueing, improved lock on after launch capability, improve small target acquisition, and provide surface attack 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: Product Development	49.117	33.989	27.049	0.000	27.049
Articles:	-	-	-	-	-
Description: Continuation of Primary Hardware Development/Pre-Planned Product Improvement (Tech Refresh) efforts for the AIM-9X weapon system. This includes Systems Engineering / Program management, as well as support required, to ensure AIM-9X missile integration with threshold US Navy aircraft platforms. This also includes efforts to redesign missile components in order to resolve Block II component obsolescence to ensure missile producibility and increase reliability beyond Lot 20. Incorporate anti-temper and cyber security					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
technology improvements, and implement cost reduction initiatives, and to comply with the Insensitive Munitions (IM) requirements as established by Joint Requirements Oversight Council memo dated 11 February 2009. ***FY 2018 Plans:*** Complete v9.317 software release to resolve F-22 aircraft deficiencies discovered during Block II integration testing. Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Incorporate anti tamper and cyber security technology improvements. Continue to develop v9.4 Block II software improvements to utilize full capability of the missile. Continue to develop missile hardware design improvements necessary to enhance IM performance. ***FY 2019 Base Plans:*** Continue Engineering Manufacturing Development required to redesign, integrate, test and qualify components due to obsolescence and implement cost reduction initiatives. Continue to develop v9.4 Block II software improvements to utilize full capability of the missile. Incorporate anti tamper and cyber security technology improvements. Continue to develop missile hardware design improvements necessary to enhance IM performance. Complete Critical Design Review necessary to incorporate IMU, dome and processor redesigns into Lot 20 production. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease in FY 2019 reflects the completion of the development activities associated the obsolescence redesign of missile components and v9.4 software improvements.					
Title: Test and Evaluation Activities and Support	5.352	8.688	12.865	0.000	12.865
Articles:	-	-	-	-	-
Description: Test and Evaluation (T&E) and associated governmental support required to ensure the AIM-9X missile integration with threshold US Navy aircraft platforms (F/A-18A+/C/D/E/F). Developmental and Operational testing of the next tech refresh version of software improvements to the missile, Operation Flight Software version 9.4. ***FY 2018 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue Developmental Testing and Integrated Testing (DT/IT-D1) planning of Operational Flight Software version 9.4 including improvements associated with further integrating the F/A-18 aircraft to utilize full capability of the Block II missile. ***FY 2019 Base Plans:*** Continue Developmental Testing and Integrated Testing (DT/IT-D1) of Operational Flight Software version 9.4 including improvements associated with further integrating the F/A-18 aircraft to utilize full capability of the Block II missile. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY 2019 reflects Developmental Testing and Integrated Testing conducted at the Naval Air Warfare Center and at Commander Operational Test Force required to incorporate software v9.4 improvements into the missile.					
Title: Management Services ***Articles:*** ***Description:*** Transportation / Travel for AIM-9X efforts in supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above. ***FY 2018 Plans:*** Continue funding transportation and travel costs associated with AIM-9X missile program efforts supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above. ***FY 2019 Base Plans:*** Continue funding transportation and travel costs associated with AIM-9X missile program efforts supporting the major test events and program decisions identified in the Product Development and Test and Evaluation sections above. ***FY 2019 OCO Plans:*** N/A	0.209 -	0.207 -	0.207 -	0.000 -	0.207 -
Accomplishments/Planned Programs Subtotals	54.678	42.884	40.121	0.000	40.121

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

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 2209: *Sidewinder*	70.912	79.692	77.927	0.381	78.308	81.970	89.480	92.044	99.881	352.510	1,725.102
• MPAF 3479: *Sidewinder*	127.438	125.350	121.253	-	121.253	122.108	164.987	108.441	118.413	33.290	2,060.745
• RDTE, AF 41: *Sidewinder*	52.898	34.952	37.511	-	37.511	28.517	19.598	16.121	14.127	Continuing	Continuing
• MPA, C62001000: *IFPC Inc 2-I Block 1, Missile*	0.000	57.742	189.047	-	189.047	336.570	415.426	292.100	0.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

Milestone C decision for LRIP was held June 24, 2011. The program received USN Initial Operational Capability (IOC) in March 2015 and Full Rate Production (FRP) Approval in August 2015 followed by contract award for FRP-1 in September 2015. The program awarded the FRP-3 contract in March 2017, and will award the option for FRP-4 in May 2018. The program plans to award FRP-5 in February 2019.

E. Performance Metrics

AIM-9X Block II:

1. Complete v9.317 software release to resolve F-22 aircraft deficiencies found during Block II integration testing (2Q FY 2018).

AIM-9X Block II Tech Refresh:

1. Complete Lot 17 Cut In Engineering Change Proposal to incorporate redesigned control actuation system battery and Block II plus (AIM-9X-3) into production (1Q FY 2018).
2. Complete Preliminary Design Review (PDR) to incorporate Inertial Measurement Unit (IMU), dome and processor redesigns into Lot 20 production (3Q FY 2018).
3. Complete Development Testing (DT-D1) for software v9.4 improvements (4Q FY 2017).
4. Complete (DT/IT-D1)for software v9.4 improvements (1Q FY 2020).
5. Complete OTRR for software v9.4 improvements (1Q FY 2020).
6. Complete Critical Design Review (CDR) to incorporate Inertial Measurement Unit (IMU), dome and processor redesigns into Lot 20 production (2Q FY 2019).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

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 & Software Development	SS/CPFF	Raytheon Missile Systems : Tucson, AZ	60.642	42.892	Feb 2017	29.221	Feb 2018	22.962	Feb 2019	-		22.962	0.000	155.717	149.391
Aircraft Integration - Contract	C/CPFF	NSMA : Arlington, VA	2.224	1.806	Mar 2017	0.432	Mar 2018	0.000		-		0.000	0.000	4.462	4.462
Aircraft Integration - USG	WR	NAWCWD : China Lake, CA	23.176	0.548	Dec 2016	0.472	Dec 2017	0.000		-		0.000	0.000	24.196	-
USG Systems Engineering & Project Managment Support	WR	NAWC AD : Patuxent River, MD	0.721	0.556	Dec 2016	0.357	Dec 2017	0.000		-		0.000	0.000	1.634	-
USG Systems Engineering & Project Managment Support	WR	NAWCWD : China Lake, CA	4.688	3.015	Dec 2016	3.507	Dec 2017	4.087	Feb 2019	-		4.087	0.000	15.297	-
Rocket Motor Technology Study	WR	Army Research Lab : Huntsville, AL	0.000	0.300	Feb 2017	0.000		0.000		-		0.000	0.000	0.300	-
Prior Year Prod Dev cost no longer funded in the FYDP	Various	Various : Various	263.154	0.000		0.000		0.000		-		0.000	0.000	263.154	-
		Subtotal	354.605	49.117		33.989		27.049		-		27.049	0.000	464.760	N/A

Remarks

1. Total prior years - FY95 and prior under PE 0603715D.
2. The decrease in Primary Hardware & Software Development between FY 2018 and FY2019 reflects curtailing the development activities associated the obsolescence redesign of missile components and v9.4 software upgrade.
3. The decrease in Aircraft Integration between FY 2018 to FY 2019 reflects completion of threshold platform software integration requirements with the AIM-9X Block II program.
4. The increase in USG Systems Engineering & Project Management from FY 2018 to FY 2019 reflects a USN government lab test support requirement to ensure tech refresh improvements are incorporated into the final hardware and software design at PAX, and conduct Insensitive Munitions Risk Reductions (IMRR) activities at China Lake.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

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 Tech Support	C/CPIF	Navy System Mgmt Activity : Arlington, VA	0.476	0.025	Feb 2017	0.000		0.000		-		0.000	0.000	0.501	0.501
Operational Test and Eval (OPTEVFOR)	C/CPFF	Wyle Lab Inc. : Huntsville, AL	0.479	0.445	Feb 2017	0.000		0.000		-		0.000	0.000	0.924	0.799
Prior Year Support Costs	C/CPFF	Various : Various	0.949	0.000		0.000		0.000		-		0.000	0.000	0.949	-
		Subtotal	1.904	0.470		0.000		0.000		-		0.000	0.000	2.374	N/A

Remarks

Provides one-time engineering and management services in support of air to air weapons development, testing, and integration 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
Oper Test & Eval	WR	COMOPTEVFOR : Norfolk, VA	8.965	0.020	Mar 2017	0.845	Mar 2018	3.933	Mar 2019	-		3.933	0.000	13.763	-
Oper Test & Eval (NAWC CL) (GOVT)	WR	NAWCWD : China Lake, CA	6.552	4.862	Dec 2016	7.843	Dec 2017	8.932	Mar 2019	-		8.932	1.960	30.149	-
Prior year T&E cost no longer funded in the FYDP	Various	Various : Various	40.382	0.000		0.000		0.000		-		0.000	0.000	40.382	-
		Subtotal	55.899	4.882		8.688		12.865		-		12.865	1.960	84.294	N/A

Remarks

Increase in Operational Test and Evaluation at COMOPTEVFOR between FY 2018 and FY2019 reflects DT/IT-D1 efforts to incorporate software v9.4 into the missile.
Increase in Development Test at China Lake between FY2018 and FY2019 reflects DT/IT-D1 efforts to test software v9.4 improvements in accordance with the test and evaluation master plan (TEMP) revision after Block II.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0207161N / *Tactical Aim Missiles*	Project (Number/Name) 0457 / *AIM-9X*	

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 - Material	WR	NAVAIR : Patuxent River, MD	0.503	0.100	Oct 2016	0.075	Oct 2017	0.075	Oct 2018	-		0.075	0.000	0.753	-
Travel - Obligation throughout the year	WR	NAWCAD : Patuxent River, MD	3.129	0.109	Oct 2016	0.132	Oct 2017	0.132	Oct 2018	-		0.132	0.134	3.636	-
Prior Year Mgmt cost no longer funded in the FYDP	Various	Various : Various	8.033	0.000		0.000		0.000		-		0.000	0.000	8.033	-
		Subtotal	11.665	0.209		0.207		0.207		-		0.207	0.134	12.422	N/A

Remarks

Provides transportation of test assets, as well as travel of persons, in support of the AIM-9X Block II System Improvement Program (SIP) III project.

	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	424.073	54.678		42.884		40.121		-		40.121	2.094	563.850	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

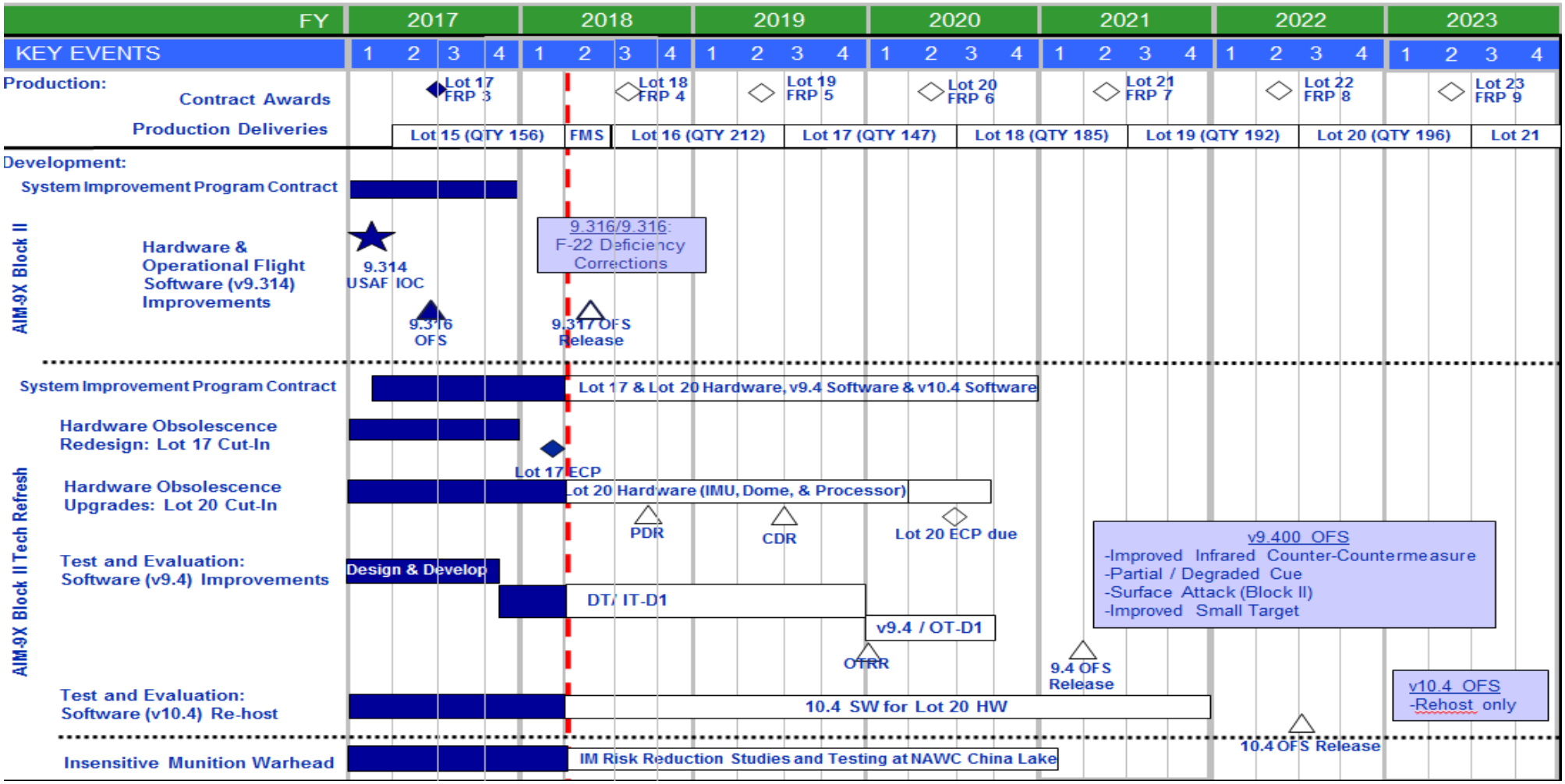


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
TACTICAL AIM MISSILES				
Production Milestones - Block II: Contract Awards: Lot 17 (FRP 3): QTY 147	2	2017	2	2017
Production Milestones - Block II: Contract Awards: Lot 18 (FRP 4): QTY 185	3	2018	3	2018
Production Milestones - Block II: Contract Awards: Lot 19 (FRP 5): QTY 192	2	2019	2	2019
Production Milestones - Block II: Contract Awards: Lot 20 (FRP 6): QTY 196	2	2020	2	2020
Production Milestones - Block II: Contract Awards: Lot 21 (FRP 7): QTY 198	2	2021	2	2021
Production Milestones - Block II: Contract Awards: Lot 22 (FRP 8): QTY 188	2	2022	2	2022
Production Milestones - Block II: Contract Awards: Lot 23 (FRP 9): QTY 173	2	2023	2	2023
Production Deliveries: Lot 15 (FRP 1) QTY 156	2	2017	1	2018
Production Deliveries: Lot 16 (FRP 2) QTY 212	3	2018	2	2019
Production Deliveries: Lot 17 (FRP 3) QTY 147	3	2019	2	2020
Production Deliveries: Lot 18 (FRP 4) QTY 185	3	2020	2	2021
Production Deliveries: Lot 19 (FRP 5) QTY 192	3	2021	2	2022
Production Deliveries: Lot 20 (FRP 6) QTY 196	3	2022	2	2023
Production Deliveries: Lot 21 (FRP 7) QTY 198	3	2023	4	2023
AIM-9X Block II: System Improvement Program Contract Award: System Improvement Program II Engineering Manufacturing Development Contract	1	2017	4	2017
AIM-9X Block II: Hardware & Software (v9.3) Improvements: Air Force Initial Operational Capability	1	2017	1	2017
AIM-9X Block II: Hardware & Software (v9.3) Improvements: Operational Flight Software Release v9.316	2	2017	2	2017
AIM-9X Block II: Hardware & Software (v9.3) Improvements: Operational Flight Software Release v9.317	2	2018	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207161N / *Tactical Aim Missiles*	**Project (Number/Name)** 0457 / *AIM-9X*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AIM-9X Block II Tech Refresh: Tech Refresh Development Contracts: System Improvement Program III Engineering Manufacturing Development Contract	1	2017	4	2020
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware (CAS Battery & Block II+)	1	2017	4	2017
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 17 Cut In: Lot 17 Hardware Cut-In Engineering Change Proposal	1	2018	1	2018
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Hardware (IMU, Dome & Processor)	1	2017	2	2020
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Preliminary Design Review	3	2018	3	2018
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Critical Design Review	2	2019	2	2019
AIM-9X Block II Tech Refresh: Hardware Obsolescence Redesign: Lot 20 Cut In: Lot 20 Hardware Cut-In Engineering Change Proposal	2	2020	2	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Testing	1	2017	4	2017
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Development Test / Integrated Testing	4	2017	1	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Test Readiness Review	1	2020	1	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Operational Testing	1	2020	4	2020
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v9.4) Improvements: Software v9.4 Release	2	2021	2	2021
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Development Testing	1	2017	4	2021
AIM-9X Block II Tech Refresh: Test and Evaluation: Software (v10.x) Rehost: Software v10.4 Operational Flight Software Release	3	2022	3	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0207163N *I AMRAAM*							
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	159.254	34.010	25.364	32.473	-	32.473	35.853	38.499	29.394	26.866	49.446	431.159
0981: *AMRAAM*	159.254	34.010	25.364	32.473	-	32.473	35.853	38.499	29.394	26.866	49.446	431.159
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 185												

A. Mission Description and Budget Item Justification

This joint Navy/Air Force program is structured in response to the Joint Service Operational Requirement and Mission Element Need Statement to develop an air superiority air-to-air missile with significant improvements in operational utility and combat effectiveness. This program supports the integration of the Advanced Medium Range Air-to-Air Missile (AMRAAM) into Navy aircraft with analysis of Navy unique applications, aircraft missile integration tasks, product improvement efforts including missile software upgrade development and procurement of hardware to support Navy test and evaluation tasks. Funding in FY 2017 through FY 2023 supports Navy unique Test & Evaluation for Navy fielding of the AIM-120C7 and AIM-120D Electronic Protection Improvement Program (EPIP) capability via System Improvement Program (SIP).

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. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	40.350	25.364	32.358	-	32.358
Current President's Budget	34.010	25.364	32.473	-	32.473
Total Adjustments	-6.340	0.000	0.115	-	0.115
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-5.000	0.000			
• SBIR/STTR Transfer	-1.340	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.115	-	0.115

Change Summary Explanation

The FY 2019 funding request was reduced by $0.605 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-2, RDT&E Budget Item Justification: PB 2019 Navy	Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0207163N *I AMRAAM*

Technical: FY 2019 includes funding for improved missile performance at longer range, increased survivability, improved lethality, continues Advanced AIM-120C7 & AIM-120D Electronic Protection Improvement Program (EPIP) and System Improvement Program (SIP) efforts through software development, simulation and test efforts, and 5th generation aerial target emulation initiatives.

Schedule: SIP schedule slip is a result of flight test complexities and delays.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0207163N / *AMRAAM*	Project (Number/Name) 0981 / *AMRAAM*	

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
0981: *AMRAAM*	159.254	34.010	25.364	32.473	-	32.473	35.853	38.499	29.394	26.866	49.446	431.159
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 185

A. Mission Description and Budget Item Justification

This joint Navy/Air Force program is structured in response to the Joint Service Operational Requirement and Mission Element Need Statement to develop an air superiority air-to-air missile with significant improvements in operational utility and combat effectiveness. This program supports the integration of the Advanced Medium Range Air-to-Air Missile (AMRAAM) into Navy aircraft with analysis of Navy unique applications, aircraft missile integration tasks, product improvement efforts including missile software upgrade development and procurement of hardware to support Navy test and evaluation tasks. Funding in FY 2017 through FY 2023 supports Navy unique Test & Evaluation for Navy fielding of the AIM-120C7 and AIM-120D Electronic Protection Improvement Program (EPIP) capability via SIP.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Test and Evaluation	5.485	4.062	5.433	0.000	5.433
Articles:	-	-	-	-	-
Description: Test and Evaluation (T&E) and associated governmental support required to ensure AIM-120 missile integration with threshold US Navy aircraft platforms (F/A-18 C/D/E/F and Joint Strike Fighter). Increased funding in FY19 is required due to additional flight test requirements and to evaluate the Hardware-in-the Loop Facility to support 5th generation aerial target emulation.					
FY 2018 Plans: Conduct OTRR for SIP-2 and EPIP Advanced Tape 2. Conduct AIM-120D SIP-2 and AIM-120C7 IT/OT test events, supply inputs to the OT test report. Certify and field EPIP Advanced Tape 1 on F/A-18. Provide test and evaluation inputs to SIP-3 designs and support the Critical Design Review.					
FY 2019 Base Plans: Complete EPIP Advanced Tape 2 OT test report and generate the fielding decision for EPIP Advanced Tape 2 fielding decision for F/A-18 aircraft in 2QFY19. Complete AIM-120D SIP-2 OT test events, supply inputs to the OT test report and generate the fielding decision for SIP-2 on F/A-18 aircraft in 4QFY19. Provide necessary documentation and provide test results for SIP-3 DT events. Evaluate Hardware-in-the-Loop Facility to support 5th generation aerial target emulation initiatives.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207163N / *AMRAAM*	**Project (Number/Name)** 0981 / *AMRAAM*

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 in FY 2019 reflects additional Operational Test and Evaluation work being performed at COMOPTEVFOR and NAWC WD China lake to incorporate software v9.4 improvements into the missile.					
Title: Identify potential improvements	0.227	0.230	0.234	0.000	0.234
Articles:	-	-	-	-	-
Description: Engineering support of AMRAAM, including investigation and analysis of technologies that offer potential improvements in AMRAAM lethality/performance and compatibility with related weapons systems. ***FY 2018 Plans:*** Continue engineering support of AMRAAM, to include investigation and analysis of technologies that offer potential improvements in AMRAAM lethality/performance and compatibility with related weapons systems. ***FY 2019 Base Plans:*** Continue engineering support of AMRAAM, to include investigation and analysis of technologies that offer potential improvements in AMRAAM lethality/performance and compatibility with related weapons systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase in FY 2019 funding is due to additional program requirements.					
Title: System Improvement Program (SIP) Efforts	28.298	21.072	26.806	0.000	26.806
Articles:	-	-	-	-	-
Description: Continuation of System Improvement Program (SIP)/Technical Maturity and Risk Reduction (TMRR) efforts for the AMRAAM weapon system. These include systems engineering, program management, missile software and/or hardware upgrades to increase capability, survivability, lethality, as well as aircraft Operational Flight Profile updates on a recurring basis. EPIP Advanced Tape 1 and Tape 2 capability improvements on the C7 missile variant will be incorporated into AIM-120D SIP-2 and 3 software updates. ***FY 2018 Plans:*** Complete AIM-120D SIP-2 IT test events, conduct Functional Configuration Audit/Test Readiness Board and enter into OT. Conduct AIM-120D SIP-3 Critical Design Review and enter into DT testing. Complete					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207163N / *AMRAAM*	**Project (Number/Name)** 0981 / *AMRAAM*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
AIM-120C7 EPIP Advanced Tape 1 OT report and field for the F/A-18. Conduct AIM-120C7 EPIP Advanced Tape 2 OT. Continue AIM-120D SIP-3 design and conduct Critical Design Review. ***FY 2019 Base Plans:*** Complete SIP-2 OT events required for fielding decision for the AIM-120D software improvement. Complete AIM-120C7 EPIP Advanced Tape 2 OT efforts and field Tape 2 in the AIM-120C7 variant. Continue AIM-120D SIP-3 development efforts. Award AIM-120D SIP-4 Risk Reduction contract and begin technology maturation and risk reduction. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Funding increase in FY 2019 is due to SIP-3 requirements along with SIP-4 risk reduction contract and technology maturation.					
Accomplishments/Planned Programs Subtotals	34.010	25.364	32.473	0.000	32.473

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/ 2206: *AMRAAM*	197.229	197.109	211.058	1.183	212.241	284.895	348.246	359.433	367.486	385.083	4,695.718
• MPAF/3479: *AMRAAM*	337.844	304.327	342.316	-	342.316	430.962	468.452	444.471	481.959	1,199.900	13,084.244
• RDTE,AF/673777: *AMRAAM*	62.470	61.145	65.228	-	65.228	66.430	67.613	68.830	56.820	45.550	1,002.330

Remarks

D. Acquisition Strategy

AMRAAM production procurements will continue across the FYDP with periodic pre-planned technical design refreshes and value engineering change proposals.

AMRAAM's Acquisition Program Baseline (APB) was updated on 28 Oct 2015.

E. Performance Metrics

Meeting cost, schedule, performance, funding and life cycle sustainment requirements 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 / 7	R-1 Program Element (Number/Name) PE 0207163N / *AMRAAM*	Project (Number/Name) 0981 / *AMRAAM*	

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 (EGLIN)	SS/CPAF	RAYTHEON COMPANY : Tucson AZ	61.247	23.616	Jan 2017	17.462	Jan 2018	22.349	Jan 2019	-		22.349	94.188	218.862	218.862
Award Fees (EGLIN)	SS/CPAF	RAYTHEON COMPANY : Tucson AZ	9.312	4.168	Jan 2017	3.082	Jan 2018	3.944	Jan 2019	-		3.944	16.621	37.127	37.127
Primary Hdw Development (NAWCAD)	WR	NAWCAD : Patuxent River MD	3.577	0.437	Nov 2016	0.460	Nov 2017	0.447	Nov 2018	-		0.447	2.366	7.287	-
Prior Years Dev Cost no longer funded in the FYDP	Various	Various : Various	26.921	0.000		0.000		0.000		-		0.000	0.000	26.921	-
		Subtotal	101.057	28.221		21.004		26.740		-		26.740	113.175	290.197	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 (NSMA)	WR	NAVY SYST MGT ACT : Arlington VA	4.273	0.227	Jan 2017	0.230	Jan 2018	0.234	Jan 2019	-		0.234	1.240	6.204	-
Prior Years Support costs no longer funded in the FYDP	Various	Various : Various	19.295	0.000		0.000		0.000		-		0.000	0.000	19.295	-
		Subtotal	23.568	0.227		0.230		0.234		-		0.234	1.240	25.499	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 (NAWCWD)	WR	NAWCWD : China Lake CA	26.709	5.485	Nov 2016	3.452	Nov 2017	4.811	Nov 2018	-		4.811	40.493	80.950	-
Oper Test & Eval	WR	COMOPTEVFOR : Norfolk, VA	0.595	0.000		0.610	Mar 2018	0.622	Mar 2019	-		0.622	3.290	5.117	-
		Subtotal	27.304	5.485		4.062		5.433		-		5.433	43.783	86.067	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0207163N / *AMRAAM*	Project (Number/Name) 0981 / *AMRAAM*

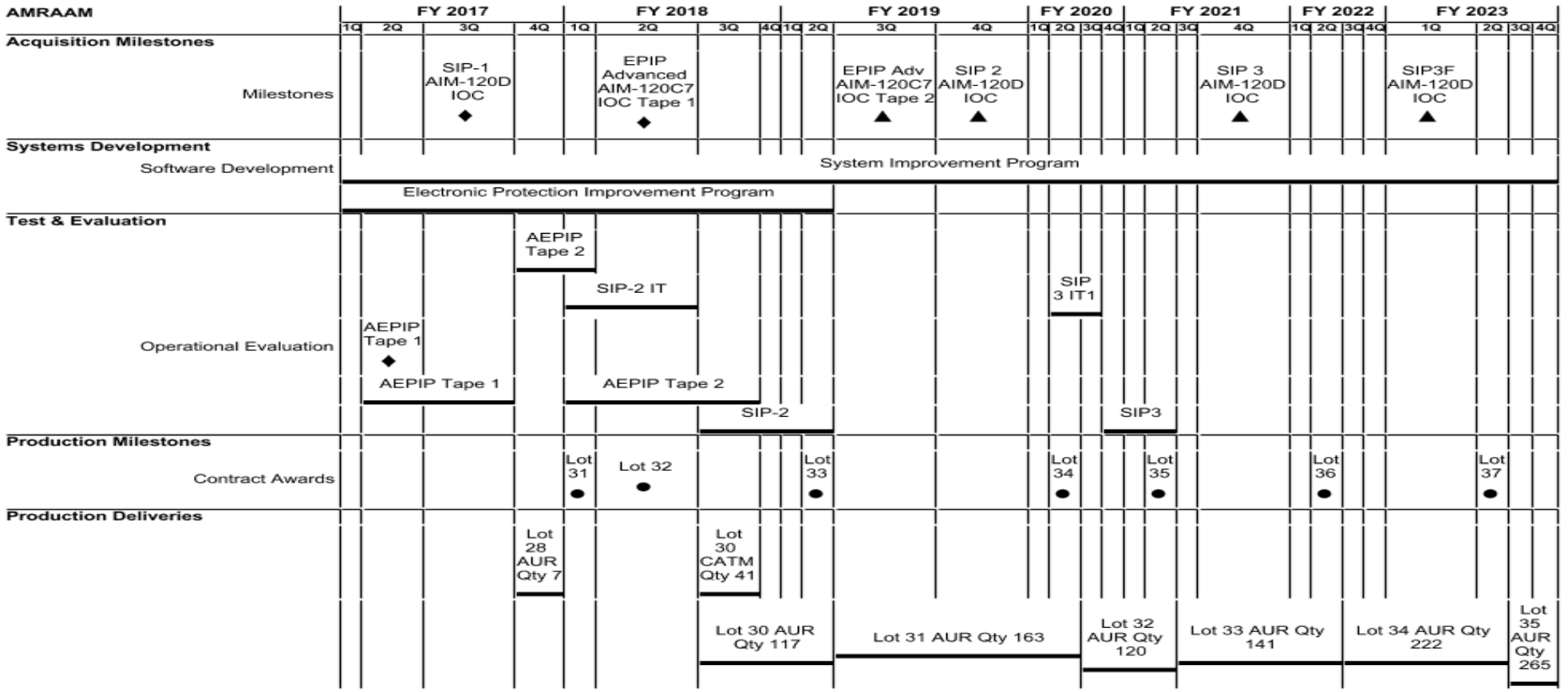
Management Services ($ in Millions)

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	MIPR	PMA-259 : Eglin AFB FL	3.323	0.077	Oct 2016	0.068	Oct 2017	0.066	Oct 2018	-		0.066	0.332	3.866	-
Prior Years Mgmt Costs no longer funded in the FYDP	Various	Various : Various	4.002	0.000		0.000		0.000		-		0.000	0.000	4.002	-
		Subtotal	7.325	0.077		0.068		0.066		-		0.066	0.332	7.868	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	159.254	34.010		25.364		32.473		-		32.473	158.530	409.631	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207163N / *AMRAAM*	**Project (Number/Name)** 0981 / *AMRAAM*



2019PB - 0207163N - 0981

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207163N / *AMRAAM*	**Project (Number/Name)** 0981 / *AMRAAM*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
AMRAAM				
Acquisition Milestones: Milestones: SIP-1 AIM-120D IOC	3	2017	3	2017
Acquisition Milestones: Milestones: EPIP Advanced AIM-120C7 IOC Tape 1	2	2018	2	2018
Acquisition Milestones: Milestones: SIP 2 AIM-120D IOC	4	2019	4	2019
Acquisition Milestones: Milestones: SIP 3 AIM-120D IOC	4	2021	4	2021
Acquisition Milestones: Milestones: SIP3F AIM-120D IOC	1	2023	1	2023
Acquisition Milestones: Milestones: EPIP Advanced AIM-120C7 IOC Tape 2	3	2019	3	2019
Systems Development: Software Development: System Improvement Program	1	2017	4	2023
Systems Development: Software Development: Electronic Protection Improvement Program	1	2017	2	2019
Test & Evaluation: AEPIP Tape 2 IT-4/5	4	2017	1	2018
Test & Evaluation: SIP-2 IT-1/2/3	1	2018	2	2018
Test & Evaluation: SIP 3 IT1-3	2	2020	3	2020
Test & Evaluation: Operational Evaluation: AEPIP Tape 1 OT-1	2	2017	2	2017
Test & Evaluation: Operational Evaluation: AEPIP Tape 1 OT-2/3	2	2017	3	2017
Test & Evaluation: Operational Evaluation: AEPIP Tape 2 OT-4/5/6	1	2018	3	2018
Test & Evaluation: Operational Evaluation: SIP-2 OT-1/2/3/4	3	2018	2	2019
Test & Evaluation: Operational Evaluation: SIP3 OT1-4	4	2020	2	2021
Production Milestones: Contract Awards: Production Lot 31 Contract Award	1	2018	1	2018
Production Milestones: Contract Awards: Production Lot 32 Contract Award	2	2018	2	2018
Production Milestones: Contract Awards: Production Lot 33 Contract Award	2	2019	2	2019
Production Milestones: Contract Awards: Production Lot 34 Contract Award	2	2020	2	2020
Production Milestones: Contract Awards: Production Lot 35 Contract Award	2	2021	2	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0207163N / *AMRAAM*	**Project (Number/Name)** 0981 / *AMRAAM*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Contract Awards: Production Lot 36 Contract Award	2	2022	2	2022
Production Milestones: Contract Awards: Production Lot 37 Contract Award	2	2023	2	2023
Production Deliveries: Production Lot 28 AUR Qty 7	4	2017	4	2017
Production Deliveries: Production Lot 30 CATM Qty 41	3	2018	3	2018
Production Deliveries: Production Lot 30 AUR Qty 117	3	2018	2	2019
Production Deliveries: Production Lot 31 AUR Qty 163	3	2019	2	2020
Production Deliveries: Production Lot 32 AUR Qty 120	3	2020	2	2021
Production Deliveries: Production Lot 33 AUR Qty 141	3	2021	2	2022
Production Deliveries: Production Lot 34 AUR Qty 222	3	2022	2	2023
Production Deliveries: Production Lot 35 AUR Qty 265	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0219902M *I Global Combat Support Systems - 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**
Total Program Element	0.000	9.128	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.128
5503: *Global Combat Support System - Marine Corps (GCSS-MC)*	0.000	9.128	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.128

A. Mission Description and Budget Item Justification

GLOBAL COMBAT SUPPORT SYSTEM-MARINE CORPS, (GCSS-MC)/Logistics Chain Management (LCM) is the implementation of the enterprise Information Technology (IT) architecture designed to support both improved and enhanced Marine Air Ground Task Force (MAGTF) Combat Support Services (CSS) functions and MAGTF Commander and Combatant Commanders/Joint Task Force (CC/JTF) combat support information requirements. The primary goal of GCSS-MC/LCM is to provide the capabilities specified in the Logistics Operational Architecture (Log OA). The result of enabling the Log OA is the retirement of logistics applications. GCSS-MC/LCM exposes timely mission information to Marine Corps operational and CSS commanders, CC/JTF commanders and their staffs and other authorized users. It exposes information interoperability and common logistics information applications and services across functional areas. GCSS-MC/LCM is an enabler that allows operating forces commanders to base decisions on complete logistics information and make decisions in concert with specific operational tasks. Other follow-on functionalities can be invoked if affordable and when defined by the problem statements.
Funding in GCSS-MC/LCM RDT&E PE 0206313M/Project 2510 transitioned to PE 0219902M/Project 5503 commencing in FY17.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	9.128	0.000	2.695	-	2.695
Current President's Budget	9.128	0.000	0.000	-	0.000
Total Adjustments	0.000	0.000	-2.695	-	-2.695
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	0.000	0.000			
• Program Adjustments	0.000	0.000	-2.695	-	-2.695

Change Summary Explanation

The decrease from FY17 to FY18 is due to change in acquisition strategy and a re-phase of the capability.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0219902M / *Global Combat Support Systems - Marine Corps*	Project (Number/Name) 5503 / *Global Combat Support System - Marine Corps (GCSS-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
5503: *Global Combat Support System - Marine Corps (GCSS-MC)*	0.000	9.128	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	9.128
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

GLOBAL COMBAT SUPPORT SYSTEM-MARINE CORPS (GCSS-MC)/Logistics Chain Management (LCM) is the physical implementation of the enterprise Information Technology (IT) architecture designed to support both improved and enhanced Marine Air Ground Task Force (MAGTF) Combat Support Services (CSS) functions and MAGTF Commander and Combatant Commanders/Joint Task Force (CC/JTF) combat support information requirements. The primary goal of GCSS-MC/LCM is to provide the capabilities specified in the Logistics Operational Architecture (LOG OA). The result of enabling the LOG OA is the retirement of logistics applications. The GCSS-MC/LCM exposes timely mission information to Marine Corps operational and CSS commanders, CC/JTF commanders and their staffs and other authorized users. It exposes information interoperability and common logistics information applications and services across functional areas. GCSS-MC/LCM is an enabler that allows operating forces commanders to base decisions on complete logistics information and make decisions in concert with specific operational tasks. Other follow-on capabilities can be invoked if affordable and when defined by the problem statements. Funding in GCSS-MC/LCM RDT&E PE 0206313M/Project 2510 transitioned to PE 0219902M/Project 5503 commencing in FY17.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Global Combat Support Systems - Marine Corps / Logistics Chain Management (GCSS-MC/LCM)	9.128	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: The decrease from FY17 to FY18 is due to change in acquisition strategy and a re-phase of the capability.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	9.128	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 / 7	**R-1 Program Element (Number/Name)** PE 0219902M / *Global Combat Support Systems - Marine Corps*	**Project (Number/Name)** 5503 / *Global Combat Support System - Marine Corps (GCSS-MC)*

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/4616: *Global Combat Support System - Marines/LCM*	1.089	1.990	1.200	-	1.200	4.500	1.230	1.256	1.281	Continuing	Continuing

Remarks

D. Acquisition Strategy

PMW 230 strategy for GCSS-MC/LCM is to 'embrace and replace' existing logistics information systems. Using the capabilities provided by GCSS-MC/LCM Increment 1, PMW 230 (PM for GCSS-MC) will embrace existing logistics information systems or replace them as appropriate with modern enabling technology that meets the requirements of the Business Case Analysis(s) (BCAs).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0219902M / *Global Combat Support Systems - Marine Corps*	Project (Number/Name) 5503 / *Global Combat Support System - Marine Corps (GCSS-MC)*	

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
GCSS-MC/LCM Product Development	TBD	TBD : TBD	0.000	8.040	Mar 2018	0.000		0.000		-		0.000	0.000	8.040	Continuing
		Subtotal	0.000	8.040		0.000		0.000		-		0.000	0.000	8.040	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
GCSS-MC/LCM Development Support	TBD	MCSC : Quantico, VA	0.000	0.838	Mar 2018	0.000		0.000		-		0.000	0.000	0.838	Continuing
		Subtotal	0.000	0.838		0.000		0.000		-		0.000	0.000	0.838	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
GCSS-MC/LCM Development Oversight	TBD	MCSC : Quantico, VA	0.000	0.250	Mar 2018	0.000		0.000		-		0.000	0.000	0.250	Continuing
		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	9.128		0.000		0.000		-		0.000	0.000	9.128	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0219902M / *Global Combat Support Systems - Marine Corps*	**Project (Number/Name)** 5503 / *Global Combat Support System - Marine Corps (GCSS-MC)*

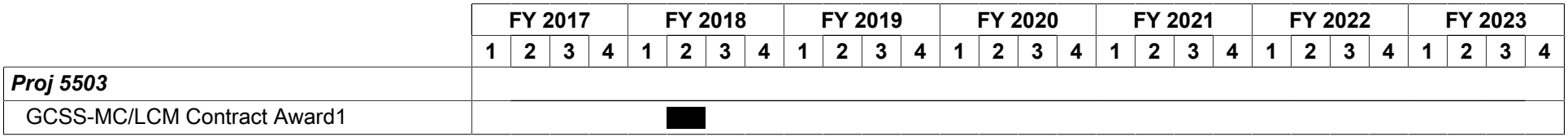


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0219902M / *Global Combat Support Systems - Marine Corps*	**Project (Number/Name)** 5503 / *Global Combat Support System - Marine Corps (GCSS-MC)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 5503				
GCSS-MC/LCM Contract Award1	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303109N *I Satellite Communications (Space)*							
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	4,684.176	30.826	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4,715.002
0728: *EHF SATCOM Terminals*	696.989	18.322	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	715.311
2472: *Mobile User Objective Sys (MUOS)*	3,987.187	10.206	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,997.393
3398: *Enterprise SATCOM Gateway Modems (ESGMs)*	0.000	2.298	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.298
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 290, 345												

A. Mission Description and Budget Item Justification

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) program for enhancing protected and survivable satellite communications to Naval forces. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with today's Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence in support of A2AD initiatives. The NMT system will replenish and improve on Navy terminal capabilities of the Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS) and Global Broadcast Service (GBS). The new system will equip the warfighters with the assured, jam resistant, secure communications as described in the joint AEHF satellite communications system and WGS Operational Requirements Documents (ORD). The NMT will provide multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

The Joint Ultra-High Frequency (UHF) Military Satellite Communications (MILSATCOM) Network Integrated Control System (JMINI CS) is a legacy system that commenced in 1998. JMINI CS is a Navy-led, Joint-interest program providing integrated, dynamic, and centralized control of non-processed UHF MILSATCOM 5/25 kHz Demand Assigned Multiple Access (DAMA) and Demand Assigned Single Access (DASA) channels to maximize existing highly sought after SATCOM resources. The system also provides decentralized web-based management of those resources for use as a situational awareness tool for Combatant Commanders, Global SATCOM Support Centers, and Regional SATCOM Support Centers. The system is expected to operate well beyond the original 2015 End of Life (EoL) date to 2033. The JMINI CS Program will perform concept development and exploration to identify cost-effective solutions to address multiple life cycle support issues, in order to minimize loss of service to the fleet. The effort will involve evaluation, development, laboratory and integration testing of Commercial Off-The-Shelf (COTS) and Government off-the-shelf (GOTS) hardware and software to replace obsolete components or subsystems while maintaining interoperability with existing systems.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303109N *I Satellite Communications (Space)*

The Mobile User Objective System (MUOS) program provides for the development of the next generation Department of Defense (DoD) advanced narrowband communications satellite constellation. The current Ultra-High Frequency (UHF) Follow-On (UFO) constellation relies on the MUOS legacy payload to meet the UHF SATCOM requirement. This MUOS Research Development Test & Evaluation, Navy (RDT&E,N) effort supports Full Operational Capability (FOC) in FY 2020.

The Navy Global Broadcast Service (GBS) Program is the Navy component of the Joint Military Satellite Communications(MILSATCOM) ACAT IC program that delivers the continuous flow of high-speed, high-volume communication and information flow for deploying, deployed, on the move, and garrisoned forces. The Joint GBS system supports the Navy Strategic Plan and equips warfighters with counter Anti-Access/Area Denial (A2AD) communications in a denied Command, Control, Communications, Computers, and Intelligence (C4I) environment. The Enterprise SATCOM Gateway Modem (ESGM) is the DoD Chief Information Officer directed solution to satisfy the Transmission Security (TRANSEC) requirement in place of the Joint Internet. Testing and fielding of the ESGM is a joint venture, operationally directed by the Defense Information Systems Agency (DISA) and the Air Force as the lead service. GBS augments and interfaces with other communications systems, provides relief to overburdened communications systems already in place, and provides information to previously unsupported users. GBS provides bandwidth five times any other system, up to 45 Mbps of forward link data (shore to ship) per WGS satellite transponder.

Beginning in FY18, the Satellite Communications (Space) funding profiles have moved from PE 0303109N to PE 1203109N.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	37.372	0.000	0.000	-	0.000
Current President's Budget	30.826	0.000	0.000	-	0.000
Total Adjustments	-6.546	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.222	0.000			
• Rate/Misc Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions Adjustments	-0.068	-	-	-	-
• Congressional Directed Reductions Adjustments	-5.256	-	-	-	-

Change Summary Explanation

Decrease in Satellite Communications (Space) by $0.93M as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303109N *I Satellite Communications (Space)*

EHF SATCOM Terminals (project 0728) - This project has transferred to a new PE 1203109N FY2018-FY2022.
Enterprise SATCOM Gateway Modems (ESGMs Project 3398) - This project has been transferred to new PE 1203109N FY2018-FY2022.

Funding:
0728: FY2018-FY2022 NMT, JALN-M and Technology Insertion funding transferred to a new PE 1203109N.
2472: FY2018-FY2022 MUOS funding transferred to a new PE 1203109N.
3398: FY2018-FY2022 ESGMs funding transferred to a new PE 1203109N.

Technical:
EHF SATCOM Terminals (project 0728) and Enterprise SATCOM Gateway Modems (ESGMs) transferred to a new PE 1203109N FY2018-FY2022.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (Space)*				Project (Number/Name) 0728 / *EHF SATCOM Terminals*			
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**
0728: *EHF SATCOM Terminals*	696.989	18.322	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	715.311
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 290												

Note

NMT FY18-FY22 funding profile has moved to PE 1203109N.

A. Mission Description and Budget Item Justification

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) Program for enhancing protected and survivable satellite communications to Naval forces. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas, and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with today's Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence. The NMT system will replenish and improve on Navy Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS), and Global Broadcast Service (GBS) terminal capabilities. The new system will equip the warfighters with assured, jam resistant, secure communications as described in both the joint AEHF Satellite Communications System and the WGS Operational Requirement Documents (ORD). Mission requirements specific to Navy operations, including threat levels and scenarios, are contained in the ORD. The NMT will provide multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

Wideband Anti-Jam Modem Systems (WAMS) enhances communication capability of shipboard and submarine NMTs by providing wideband Anti-Jam (AJ) Satellite Communication throughput over Wideband Global SATCOM (WGS). WAMS enables space segment AJ diversity (EHF/AEHF and WGS), thus enabling NMT ships and submarines equipped with the modem to operate in wideband links closer to threat jammers. WAMS enables the use of WGS X and Ka-band resources to assure access to mission critical communications in the A2AD environment. The use of WAM Protected Tactical Waveform (PTW) on WGS will augment AEHF extended data rate (XDR) services to provide the information throughput capacity necessary to support critical Command and Control capability.

Joint Aerial Layer Network-Maritime (JALN-M) is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially in an Anti-Access Area Denial (A2AD) satellite denied environment. With disruption or loss of Space tier communications, JALN-M establishes and/or restores connectivity within the High Capacity Backbone (HCB) Common Data Link (CDL) tier, the Distribution Access Range Extension (DARE) tier, and the Transition tier in accordance with the JALN-M Initial Capabilities Document and the JALN Analysis of Alternatives (AoA) Final Report. JALN-M is a robust, assured communications capability providing joint connectivity via the HCB and Navy platform connectivity via a pseudo satellite DARE capability. JALN-M will use the Extended Data Rate (XDR) NMT waveform for intra-battle group DARE communications, a Common Data Link (CDL) waveform for the HCB cross-link capability, and intend to develop a pre-planned product improvement to leverage enhanced Ultra High Frequency/High Frequency (UHF/HF) waveforms for coalition connectivity. A critical component of A2AD is Adaptive Coding software development incorporation into the baseline NMT terminal in addition to supporting the JALN-M demonstration. This capability

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

autonomously enhances maximum throughput and supports degraded conditions by adjusting End-to-End code rate to provide continuous, mission critical, and protected communications.

Technology Insertion, studies and implementation is necessary for military satellite communications systems development to support emerging technologies for Commercial Broadband Satellite Program (CBSP) and Global Broadcast Service (GBS) Terminals. Efforts will include evaluation of End-to-End performance testing of data rates associated with Broadband and Broadcast transmissions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NMT Development	7.438	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Overall program efforts include investigation of emerging technologies through study, development, and associated testing for feasibility of satellite communications-related program insertion.					
FY 2018 Plans: NMT Development FY18 funding profile has moved to PE 1203109N.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: NMT Development FY18 funding profile has moved to PE 1203109N.					
Title: Joint Aerial Layer Network Maritime (JALN-M)	10.784	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Joint Aerial Layer Network Maritime (JALN-M) FY18 funding profile has moved to PE 1203109N.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Joint Aerial Layer Network Maritime (JALN-M) FY18 funding profile has moved to PE 1203109N.					
Title: Technology Insertion	0.100	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: Overall program efforts include technology insertion implementation and associated testing required to support satellite communications. ***FY 2018 Plans:*** Technology Insertion FY18 funding has transferred to PE 1203109N. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Technology Insertion FY18 funding has transferred to PE 1203109N.					
Accomplishments/Planned Programs Subtotals	18.322	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/3216: *Navy Multiband Terminal (NMT)*	33.992	69.764	113.885	-	113.885	92.150	21.536	31.279	19.072	73.062	1,508.298

Remarks

D. Acquisition Strategy

The NMT Follow-On Full Deployment (FOFD) contract will continue NMT production for Afloat platforms and Shore locations, in support of the Chief of Naval Operations and the Department of the Navy (DON), and will allow the NMT Program to complete Full Operational Capability (FOC). The competitive contract awarded to COMTECH supports the development of Anti-Access Area Denial (A2AD).

E. Performance Metrics

The RDT&E goal for the NMT program is to create a military satellite communications system that consolidates capabilities of current and future satellite systems into a single terminal. SATCOM-related technology insertion, studies and associated testing will support the GBS and CBSP Programs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

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	431.733	0.000		0.000		0.000		-		0.000	0.000	431.733	-
Software Development	C/CPAF	Raytheon : Marlborough, MA	71.425	0.000		0.000		0.000		-		0.000	12.492	83.917	-
Systems Engineering	WR	SSC PAC : San Diego, CA	22.088	2.733	Jan 2017	0.000		0.000		-		0.000	0.000	24.821	-
Systems Engineering	WR	NUWC : Newport, RI	37.122	4.026	Jan 2017	0.000		0.000		-		0.000	3.000	44.148	-
Software Development JALN-M	C/CPAF	RAYTHEON : Marlborough, MA	12.492	0.843	Mar 2017	0.000		0.000		-		0.000	0.000	13.335	-
Systems Engineering	C/CPAF	Systech : San Diego, CA	5.438	0.000		0.000		0.000		-		0.000	0.000	5.438	-
Software Development Time of Day (TOD)	C/CPAF	RAYTHEON : Marlborough, MA	0.000	0.126	Jan 2017	0.000		0.000		-		0.000	0.000	0.126	-
Systems Engineering	C/CPFF	MIT/LL : Marlborough, MA	0.400	0.250	May 2017	0.000		0.000		-		0.000	0.400	1.050	-
Software Development ATIP Adaptive Coding (AC) /Time of Day (TOD)	C/CPFF	COMTECH : Tempe, AZ	27.463	2.544	Nov 2016	0.000		0.000		-		0.000	2.867	32.874	-
		Subtotal	608.161	10.522		0.000		0.000		-		0.000	18.759	637.442	N/A

Remarks

FY17 initiated studies for the Adaptive Coding Time of Day effort. FY18 NMT Product Development focuses on the complexity of software design development across systems and vendors to support Adaptive Coding Time of Day (TOD) Encryption. The program will be performing NMT testing with Enhanced Polar Systems (EPS) and will initiate testing of the PTSFD EDM modems. FY18 funding profile has moved to PE 1203109N.

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	Various	Various : Various	25.722	0.000		0.000		0.000		-		0.000	0.000	25.722	-
Software Integration/ Government Oversight	WR	NUWC : Newport, RI	2.280	1.887	Nov 2016	0.000		0.000		-		0.000	2.008	6.175	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (Space)*	Project (Number/Name) 0728 / *EHF SATCOM Terminals*	

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 Engineering Support	C/CPAF	SYSTECH : San Diego, CA	2.559	0.660	Nov 2016	0.000		0.000		-		0.000	1.194	4.413	-
Software Integration Support	WR	SSC PAC : San Diego, CA	1.266	0.733	Nov 2016	0.000		0.000		-		0.000	1.266	3.265	-
		Subtotal	31.827	3.280		0.000		0.000		-		0.000	4.468	39.575	N/A

Remarks

NMT FY18 funding profile has moved to PE 1203109N.

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
EPS & JALN-M Development	WR	SSC PAC : San Diego, CA	24.197	2.789	Nov 2016	0.000		0.000		-		0.000	2.000	28.986	-
Operational Test & Evaluation 1	WR	COMOPTEVFOR : Norfolk, VA	5.969	0.139	Nov 2016	0.000		0.000		-		0.000	0.100	6.208	-
Developmental Test & Evaluation	C/CPAF	Raytheon : Marlborough, MA	3.947	0.000		0.000		0.000		-		0.000	0.000	3.947	-
		Subtotal	34.113	2.928		0.000		0.000		-		0.000	2.100	39.141	N/A

Remarks

NMT FY18 funding profile has moved to PE 1203109N.

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 Management	C/CPFF	BAH : San Diego	9.445	0.200	Nov 2016	0.000		0.000		-		0.000	0.220	9.865	-
Program Management	C/CPFF	BAH : San Diego	10.899	1.342	Nov 2016	0.000		0.000		-		0.000	1.654	13.895	-
Acquisition Management	WR	NCCA : Various	0.653	0.000		0.000		0.000		-		0.000	0.000	0.653	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

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	SPAWAR : Various	1.891	0.050	Nov 2016	0.000		0.000		-		0.000	0.040	1.981	-
		Subtotal	22.888	1.592		0.000		0.000		-		0.000	1.914	26.394	N/A

Remarks

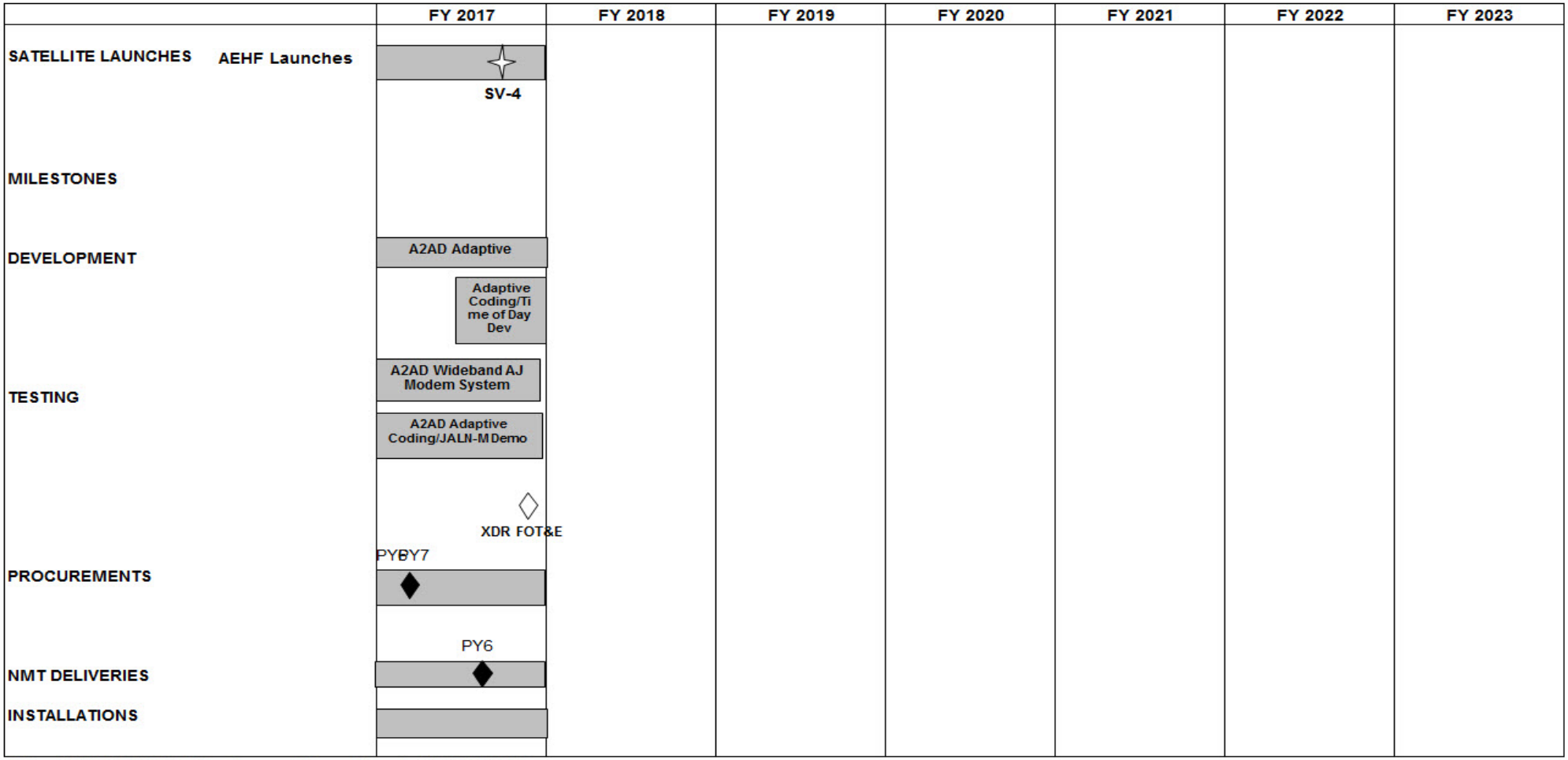
NMT FY18 funding profile has moved to PE 1203109N.

	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	696.989	18.322		0.000		0.000		-		0.000	27.241	742.552	N/A

Remarks

NMT FY18 funding profile has moved to PE 1203109N.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*



Note: FY18-FY23 NMT funding profile resides in PE 1203109N.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0728				
Procurement Year 6 (PY6)	1	2017	1	2017
AEHF Launch SV-4	3	2017	3	2017
A2AD Adaptive Coding & JALN-M Development	1	2017	4	2017
A2AD Wideband AJ Modem Development	1	2017	4	2017
XDR FOT&E	4	2017	4	2017
A2AD Wideband AJ Modem System (WAMS) Development	1	2017	4	2017
Procurement Year 7 (PY7)	1	2017	1	2017
FRP PY6 Delivery	3	2017	3	2017
A2AD Adaptive Coding/Time of Day	3	2017	4	2017
A2AD Adaptive Coding/JALN-M Demo Integration & Test	1	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (Space)*				Project (Number/Name) 2472 / *Mobile User Objective Sys (MUOS)*			
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**
2472: *Mobile User Objective Sys (MUOS)*	3,987.187	10.206	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3,997.393
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
Project MDAP/MAIS Code: 345												

Note

Project 2472 will be realigned to PE 1203109N FY2018-FY2022

A. Mission Description and Budget Item Justification

The Mobile User Objective System (MUOS) provides a worldwide, multi-service population of mobile and fixed-site terminal users with Ultra-High Frequency (UHF), narrowband, beyond line of sight satellite communications (SATCOM). MUOS significantly increases performance and capacity in support of critical Combatant Command SATCOM priorities. MUOS is the replacement system for the UHF Follow-on (UFO) system, which is currently beyond its design life. MUOS consists of Space, Ground, and User Entry Segments. The Space Segment consists of 5 geosynchronous satellites, one which is an on-orbit spare, and provides both a legacy UHF payload, which is backward compatible with UFO, and a Wideband Code Division Multiple Access (WCDMA) payload, which provides 3G cellular-like capability. The Ground Segment consists of four world-wide Radio Access Facilities (RAFs) and two satellite control facilities. Each RAF includes three 60 ft. antennas, and numerous racks of equipment. The RAF in Hawaii includes a Network Management Facility (NMF). The RAFs in Hawaii and Virginia each include a Switching Facility (SF). The User Entry Segment consists of the MUOS waveform that is ultimately integrated into MUOS-capable terminals. The MUOS legacy capability has been in operational use since 2012, and the WCDMA capability transitioned to Early Combatant Command Use in July 2016.

In addition to providing UHF SATCOM for the Department of Defense (DoD), the Navy has the overall responsibility to deliver the End-to-End (E2E) MUOS capability to the warfighter. This responsibility involves systems engineering, integration, and test management of all MUOS system of system activities, to include the integration of the MUOS waveform into MUOS-capable terminals and the subsequent terminal certification testing.

In June 2016 based on the results of the Multi-Service Operational Test and Evaluation-2 (MOT&E-2), Director, Operational Test & Evaluation (DOT&E) assessed MUOS not operationally effective or suitable. As a result of the program addressing findings and preparing for MOT&E-2B in FY19, Full Operational Capability (FOC) has been moved to FY20.

The budget line beginning in FY17 is dedicated to completion of the MOT&E-2B activities, system optimization to address the dynamic, worldwide electromagnetic and cybersecurity environment in which MUOS operates, and testing to support certification of MUOS-capable terminals.

Funding moved from PE 0303109N to 1203109N starting in FY18.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Mobile User Objective Sys (MUOS)	10.206	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					
Accomplishments/Planned Programs Subtotals	10.206	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
• WPN/2433: *Mobile User Objective System (MUOS)*	33.723	46.357	66.779	-	66.779	67.380	53.460	45.985	46.907	617.197	3,044.814

Remarks

D. Acquisition Strategy

Currently sustainment and engineering activities are procured via the baseline MUOS Risk Reduction and Design Development contract. The program is working to transition these activities to dedicated sustainment contracts for the Ground/User Entry and Space Segments. Integration of the MUOS waveform into MUOS-capable terminals and execution of certification testing of MUOS-capable terminals are executed primarily by the Navy Working Capital Funded SPAWAR Systems Center Pacific.

E. Performance Metrics

MUOS Goal: Achieve Full Operational Capability in FY 2020.

Metric: Successfully complete 5 developmental test assist events in FY18, and Multi-Service Operational Test and Evaluation-2B FY19.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

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
RRDD AOS Contract	C/CPAF	Lockheed Martin (LM) : Sunnyvale, CA	3,550.527	3.306	Oct 2016	0.000		0.000		-		0.000	0.000	3,553.833	-
Product Development PY	Various	Various : Various	133.670	0.000		0.000		0.000		-		0.000	0.000	133.670	-
		Subtotal	3,684.197	3.306		0.000		0.000		-		0.000	0.000	3,687.503	N/A

Remarks

In accordance with Program Office's Acquisition Strategy, engineering services will be continued and negotiated on a new contract vehicle to be awarded in FY18.
Increase of ~$600K in RRDD AOS Contract (Engineering Contract) from FY17 to FY18 due to increased efforts to address Operational Test deficiencies.
Funding moved from PE 0303109N to 1203109N starting in FY18.

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 PY	Various	Various : Various	38.378	0.000		0.000		0.000		-		0.000	0.000	38.378	-
		Subtotal	38.378	0.000		0.000		0.000		-		0.000	0.000	38.378	N/A

Remarks

Funding moved from PE 0303109N to 1203109N starting in FY18.

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	Various : Various	31.269	0.000		0.000		0.000		-		0.000	0.000	31.269	-
		Subtotal	31.269	0.000		0.000		0.000		-		0.000	0.000	31.269	N/A

Remarks

Increase of $1.765M in Test and Evaluation efforts from FY17 to FY18 due to Test Assist Events in preparation for MOT&E-2B.
Funding moved from PE 0303109N to 1203109N starting in FY18.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

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	145.363	3.000	Nov 2016	0.000		0.000		-		0.000	0.000	148.363	-
Government Engineering	Various	Various : Various	38.444	3.900	Oct 2016	0.000		0.000		-		0.000	0.000	42.344	-
Management Services PY including Travel	Various	Various : Various	49.536	0.000		0.000		0.000		-		0.000	0.000	49.536	-
		Subtotal	233.343	6.900		0.000		0.000		-		0.000	0.000	240.243	N/A

Remarks

Funding moved from PE 0303109N to 1203109N starting 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	3,987.187	10.206		0.000		0.000		-		0.000	0.000	3,997.393	N/A

Remarks

Funding moved from PE 0303109N to 1203109N starting in FY18.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

MUOS Program Schedule

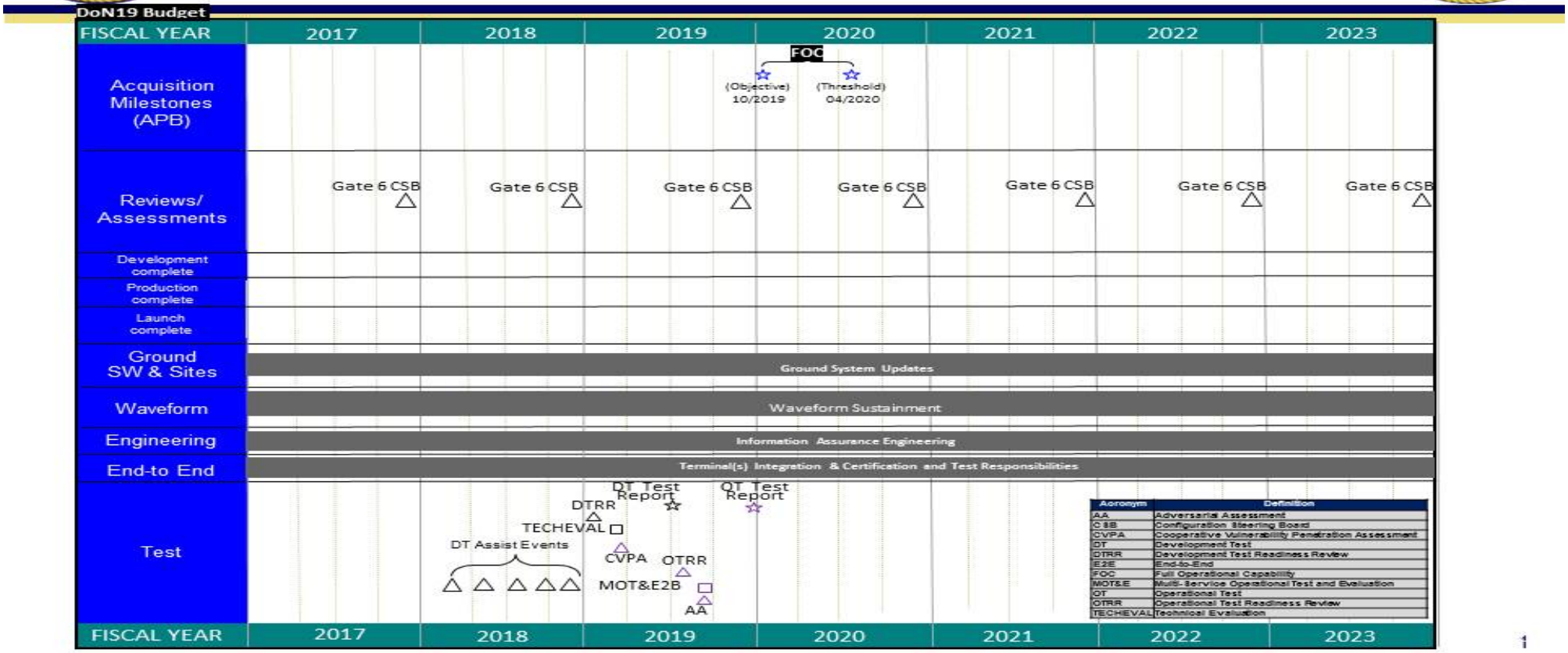


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2472				
Gate 6/CSB FY17	4	2017	4	2017
Ground System Updates	1	2017	4	2017
Waveform Sustainment	1	2017	4	2017
Information Assurance Engineering	1	2017	4	2017
Terminal Integration, Certification, and Test	1	2017	4	2017

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (Space)*	Project (Number/Name) 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*	

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
3398: *Enterprise SATCOM Gateway Modems (ESGMs)*	0.000	2.298	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.298
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

ESGM's FY18-FY19 funding profile has moved to PE 1203109N.

A. Mission Description and Budget Item Justification

The Navy Global Broadcast Service (GBS) Program is the Navy component of the Joint Military Satellite Communications (MILSATCOM) program that delivers the continuous flow of high-speed, high-volume communication and information flow for deploying, deployed, on the move, and garrisoned forces. The GBS system supports the Navy Strategic Plan and equips warfighters with counter Anti-Access/Area Denial (A2AD) communications in a denied Command, Control, Communications, Computers, and Intelligence (C4I) environment. GBS provides Satellite Communications (SATCOM) capability for forces afloat, ashore, and Naval Special Warfare Command.

The Enterprise SATCOM Gateway Modem (ESGM) is the DoD Chief Information Officer directed solution to satisfy the Transmission Security (TRANSEC) requirement. This modem will replace the existing modem in the GBS System. Testing and fielding of the ESGM is a joint venture, operationally directed by the Defense Information Systems Agency (DISA) and the Air Force as the lead service. Additionally, the ESGM will continue to enable GBS reception of the Digital Video Broadcast - Satellite 2nd Generation (DVB-S2).

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 SATCOM Gateway Modems (ESGMs)	2.298	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: Enterprise SATCOM Gateway Modems (ESGMs) FY18 funding profile resides in PE 1203109N.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	2.298	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 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The GBS program reached a Full Rate Production Decision on 24 Oct 2008 and is in sustainment. The Enterprise Satellite Communications (SATCOM) Gateway Modem (ESGM), the Commercial Off-The-Shelf (COTS) Internet Protocol (IP) modem, provides Transmission Security functionality in support of DoD CIO direction to implement Information Assurance for all transmission media.

E. Performance Metrics

The RDT&E goal for the GBS program is to create a military satellite communications system that supports current and future requirements for Anti-Access/Area Denial and Information Assurance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303109N / *Satellite Communications (Space)*	Project (Number/Name) 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*	

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	SSC PAC : San Diego, CA	0.000	0.559	May 2017	0.000		0.000		-		0.000	0.000	0.559	-
Systems Engineering	WR	NUWC : Newport, RI	0.000	0.280	May 2017	0.000		0.000		-		0.000	0.000	0.280	-
Systems Engineering	WR	SSC LANT : Charleston, SC	0.000	0.754	May 2017	0.000		0.000		-		0.000	0.000	0.754	-
		Subtotal	0.000	1.593		0.000		0.000		-		0.000	0.000	1.593	N/A

Remarks

ESGM's FY18 funding profile has moved to PE 1203109N.

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	SYSTECH : San Diego, CA	0.000	0.200	May 2017	0.000		0.000		-		0.000	0.000	0.200	-
Developmental Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.370	May 2017	0.000		0.000		-		0.000	0.000	0.370	-
		Subtotal	0.000	0.570		0.000		0.000		-		0.000	0.000	0.570	N/A

Remarks

ESGM's FY18 funding profile has moved to PE 1203109N.

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	BAH : San Diego	0.000	0.120	May 2017	0.000		0.000		-		0.000	0.000	0.120	-
Travel	Reqn	SPAWAR : Various	0.000	0.015	May 2017	0.000		0.000		-		0.000	0.000	0.015	-
		Subtotal	0.000	0.135		0.000		0.000		-		0.000	0.000	0.135	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*

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
Remarks ESGM's FY18 funding profile has moved to PE 1203109N.															

	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	2.298		0.000		0.000		-		0.000	0.000	2.298	N/A

Remarks

ESGM's FY18 funding profile has moved to PE 1203109N.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*

	2017	2018	2019	2020	2021	2022	2023
DEVELOPMENT and INTEGRATION	ESGM Development & Integration						
TESTING							
PROCUREMENT							

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303109N / *Satellite Communications (Space)*	**Project (Number/Name)** 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3398				
ESGM Development and Integration	4	2017	4	2017

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303138N *I Consolidated Afloat Network Ent Services(CANES)*

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	179.639	23.224	24.271	23.697	-	23.697	22.173	22.656	23.186	23.671	280.704	623.221
9C87: *CANES Integration*	179.639	23.224	24.271	23.697	-	23.697	22.173	22.656	23.186	23.671	280.704	623.221

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): M417

A. Mission Description and Budget Item Justification

Consolidated Afloat Networks and Enterprise Services (CANES) is the Navy's Program of Record (POR) to replace and modernize existing afloat networks with the necessary hardware, software and enterprise services infrastructure to enable information warfare from and within the tactical domain. CANES provides complete infrastructure inclusive of hardware, software, processing, storage and end user devices for the Unclassified, Coalition, Secret and Sensitive Compartmented Information (SCI) enclaves to a wide variety of Navy surface combatants, submarines and Maritime Operations Centers. CANES services include application hosting, data transport and storage, system management, cyber security, email, web, chat, collaboration, and voice and video services. CANES is based on the overarching concept of reducing the number of afloat networks and providing enhanced efficiency through a single engineering focus on integrated technical solutions. It allows for streamlined acquisition, contracting, test events, sustainment, and significant lifecycle efficiencies through consolidation of multiple configuration management baselines, logistics, and training efforts into a single unified support structure.

More than eighty (80) hosted applications and systems inclusive of Command and Control, Intelligence, Surveillance and Reconnaissance, Information Operations, Logistics and Business domains require the CANES infrastructure to operate in the tactical environment. Specific programs, such as Distributed Common Ground System - Navy (DCGS-N), Global Command and Control System - Maritime (GCCS-M), Naval Tactical Command Support System (NTCSS), and Undersea Warfare Decision Support System (USW-DSS), no longer provide their own independent network hardware and now depend on CANES to field, host, and sustain their capabilities. The CANES Application Integration program provides common software governance, testing, processes, and tools to application developers, and evaluates and confirms compatibility between CANES and the hosted applications prior to fielding. CANES also provides a set of capabilities called Agile Core Services (ACS) which brings common network services to allow hosted application developers to focus on the unique capabilities they provide.

CANES is funded and programmed to develop regular technical updates with an agile and robust hardware and software baseline development cycle necessary to pace rapidly evolving cyber security threats and meet emerging operational demands within the tactical domain. In order to deliver a mission effective, secure and affordable afloat network, CANES implements a Development Operations (DevOps) framework to improve its engineering processes and speed the deployment of new cyber security, application hosting and baseline updates. CANES requires that Automated Digital Network System (ADNS) field prior to or concurrently with CANES due to the architectural reliance between the two programs.

In FY 2019, CANES RDT&E investment will continue the development of the Technical Insertion (TI) 3 functional baselines including Enterprise Engineering and Certification (E2C) laboratory engineering efforts; perform systems engineering efforts to complete and update technical data packages; perform Development Testing in

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303138N *I Consolidated Afloat Network Ent Services(CANES)*

support of submarine functional baselines; and perform Development Testing Assist (DTA) for TI 3 software development. Additionally, new and emerging technologies will be evaluated for integration into future CANES TI baselines.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	23.541	24.271	22.410	-	22.410
Current President's Budget	23.224	24.271	23.697	-	23.697
Total Adjustments	-0.317	0.000	1.287	-	1.287
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.306	0.000			
• Program Adjustments	0.000	0.000	1.422	-	1.422
• Rate/Misc Adjustments	0.000	0.000	-0.135	-	-0.135
• Congressional General Reductions Adjustments	-0.011	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($0.314) 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: N/A

Funding: $1.5M added in FY2019 to develop CANES functional baseline for Aegis Ashore modernization efforts.

Schedule:
Development Testing (DT) for submarines will be in Q1FY19 due to submarine test platform operational commitments. FDD was achieved in 1QFY16.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)*	Project (Number/Name) 9C87 / *CANES 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
9C87: *CANES Integration*	179.639	23.224	24.271	23.697	-	23.697	22.173	22.656	23.186	23.671	280.704	623.221
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: M417

A. Mission Description and Budget Item Justification

Consolidated Afloat Networks and Enterprise Services (CANES) is the Navy's Program of Record (POR) to replace and modernize existing afloat networks with the necessary hardware, software and enterprise services infrastructure to enable information warfare from and within the tactical domain. CANES provides complete infrastructure inclusive of hardware, software, processing, storage and end user devices for the Unclassified, Coalition, Secret and Sensitive Compartmented Information (SCI) enclaves to a wide variety of Navy surface combatants, submarines and Maritime Operations Centers. CANES services include application hosting, data transport and storage, system management, cyber security, email, web, chat, collaboration, and voice and video services. CANES is based on the overarching concept of reducing the number of afloat networks and providing enhanced efficiency through a single engineering focus on integrated technical solutions. It allows for streamlined acquisition, contracting, test events, sustainment, and significant lifecycle efficiencies through consolidation of multiple configuration management baselines, logistics, and training efforts into a single unified support structure.

More than eighty (80) hosted applications and systems inclusive of Command and Control, Intelligence, Surveillance and Reconnaissance, Information Operations, Logistics and Business domains require the CANES infrastructure to operate in the tactical environment. Specific programs, such as Distributed Common Ground System - Navy (DCGS-N), Global Command and Control System - Maritime (GCCS-M), Naval Tactical Command Support System (NTCSS), and Undersea Warfare Decision Support System (USW-DSS), no longer provide their own independent network hardware and now depend on CANES to field, host, and sustain their capabilities. The CANES Application Integration program provides common software governance, testing, processes, and tools to application developers, and evaluates and confirms compatibility between CANES and the hosted applications prior to fielding. CANES also provides a set of capabilities called Agile Core Services (ACS) which brings common network services to allow hosted application developers to focus on the unique capabilities they provide.

CANES is funded and programmed to develop regular technical updates with an agile and robust hardware and software baseline development cycle necessary to pace rapidly evolving cyber security threats and meet emerging operational demands within the tactical domain. In order to deliver a mission effective, secure and affordable afloat network, CANES implements a Development Operations (DevOps) framework to improve its engineering processes and speed the deployment of new cyber security, application hosting and baseline updates. CANES requires that Automated Digital Network System (ADNS) field prior to or concurrently with CANES due to the architectural reliance between the two 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: CANES Integration	23.224	24.271	23.697	0.000	23.697
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Complete TI 2 hardware and software baseline development and initiate development of TI 3 software baseline including E2C laboratory engineering efforts. Perform systems engineering efforts for TI 3 to complete functional baselines and update technical data packages. ***FY 2019 Base Plans:*** Continue development of Technical Insertion (TI) 3 functional baseline including ACS; Enterprise Engineering and Certification (E2C) laboratory engineering efforts; and implementation of a Development Operations development and testing environment. Perform systems engineering efforts to complete functional baselines and update technical data packages in support of TI 3. Perform Development Testing in support of CANES submarine functional baseline and perform Development Testing Assist (DTA) for TI 3 software development. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Minor reduction of RDT&E funding from FY2018 to FY2019 attributed to previous increase to FY18 RDT&E budget for data cloud integration via Agile Core Services (ACS).					
Accomplishments/Planned Programs Subtotals	23.224	24.271	23.697	0.000	23.697

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/2915: *CANES*	207.730	322.754	423.027	-	423.027	428.315	394.533	441.888	414.738	2,881.395	6,677.715
• OPN/2925: *CANES Intell*	35.313	48.028	54.465	-	54.465	54.528	47.749	52.764	50.129	469.064	1,096.285

Remarks

D. Acquisition Strategy

CANES is an ACAT IAC Major Automated Information System (MAIS) program. The program office employed a multiple-phase, multiple-award down-select contract strategy to reduce program risks and maintain competition in both design development and limited production during contract performance. Milestone C was achieved in 1QFY13 and Full Deployment Decision (FDD) was achieved in 1QFY16. In 2QFY15, a separate full and open indefinite delivery indefinite quantity (IDIQ) multiple award contract (MAC) production contract was awarded to support future production. CANES is programmed to develop regular technical updates to its hardware and software baselines to ensure that no cyber security vulnerabilities exist due to hardware and software obsolescence.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*

E. Performance Metrics

Early RDT&E investment and sustainment of dual design contractors through the development phase reduced Total Ownership Cost (TOC) from Milestone B to Milestone C. Cost avoidance throughout the life of the program is based on 1) reducing the number of networks through the use of mature, certified, cross domain technologies; 2) reducing the infrastructure footprint and associated costs for hardware afloat; and 3) providing increased capability to meet current and projected war fighter requirements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)*	**Project (Number/Name)** 9C87 / *CANES 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
Prior Year Product Development	Various	Various : Various	158.657	0.000		0.000		0.000		-		0.000	0.000	158.657	162.000
Primary Hardware Development	WR	SSC : San Diego, CA and Charleston, SC	0.000	8.194	Nov 2016	9.220	Nov 2017	8.894	Nov 2018	-		8.894	133.274	159.582	160.000
Primary Software Development	WR	SSC : San Diego, CA and Charleston, SC	0.000	7.257	Nov 2016	9.721	Nov 2017	9.492	Nov 2018	-		9.492	140.516	166.986	169.000
Systems Engineering	C/CPFF	Booz Allen Hamilton (BAH) : San Diego, CA	0.000	0.315	Dec 2016	0.670	Dec 2017	0.654	Dec 2018	-		0.654	9.685	11.324	12.000
Systems Engineering	WR	SSC : San Diego, CA and Charleston, SC	0.000	4.481	Nov 2016	2.750	Dec 2017	2.685	Dec 2018	-		2.685	39.751	49.667	51.000
Systems Engineering	MIPR	US ARMY CECOM (MITRE) : San Diego, CA	0.000	0.827	Dec 2016	0.790	Nov 2017	0.776	Nov 2018	-		0.776	11.419	13.812	14.000
		Subtotal	158.657	21.074		23.151		22.501		-		22.501	334.645	560.028	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 Year Support	Various	Various : Various	3.854	0.000		0.000		0.000		-		0.000	0.000	3.854	4.000
Studies & Design	WR	SSC : San Diego, CA	0.000	0.150	Jan 2017	0.460	Nov 2017	0.449	Nov 2018	-		0.449	6.649	7.708	8.500
Certification Authority	C/CPFF	NSMA : Washington, DC	0.000	0.377	Apr 2017	0.000		0.000		-		0.000	0.000	0.377	0.500
Certification Authority	C/CPFF	Booz Allen Hamilton (BAH) : San Diego,CA	0.000	0.863	Dec 2016	0.450	Dec 2017	0.439	Dec 2018	-		0.439	6.505	8.257	8.500
		Subtotal	3.854	1.390		0.910		0.888		-		0.888	13.154	20.196	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)*	Project (Number/Name) 9C87 / *CANES 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
Prior Year Test & Evaluation	Various	Various : Various	4.944	0.000		0.000		0.000		-		0.000	0.000	4.944	5.200
Operational Test & Evaluation	MIPR	JITC : Fairfax, VA	0.000	0.167	Feb 2017	0.150	Feb 2018	0.250	Feb 2019	-		0.250	2.168	2.735	3.100
Development Test & Evaluation	WR	SSC : San Diego, CA	0.000	0.165	Nov 2016	0.000		0.000		-		0.000	0.000	0.165	0.500
Development Test & Evaluation	MIPR	DTIC : Ft Belvoir, VA	0.000	0.373	Feb 2017	0.000		0.000		-		0.000	0.000	0.373	0.500
		Subtotal	4.944	0.705		0.150		0.250		-		0.250	2.168	8.217	N/A

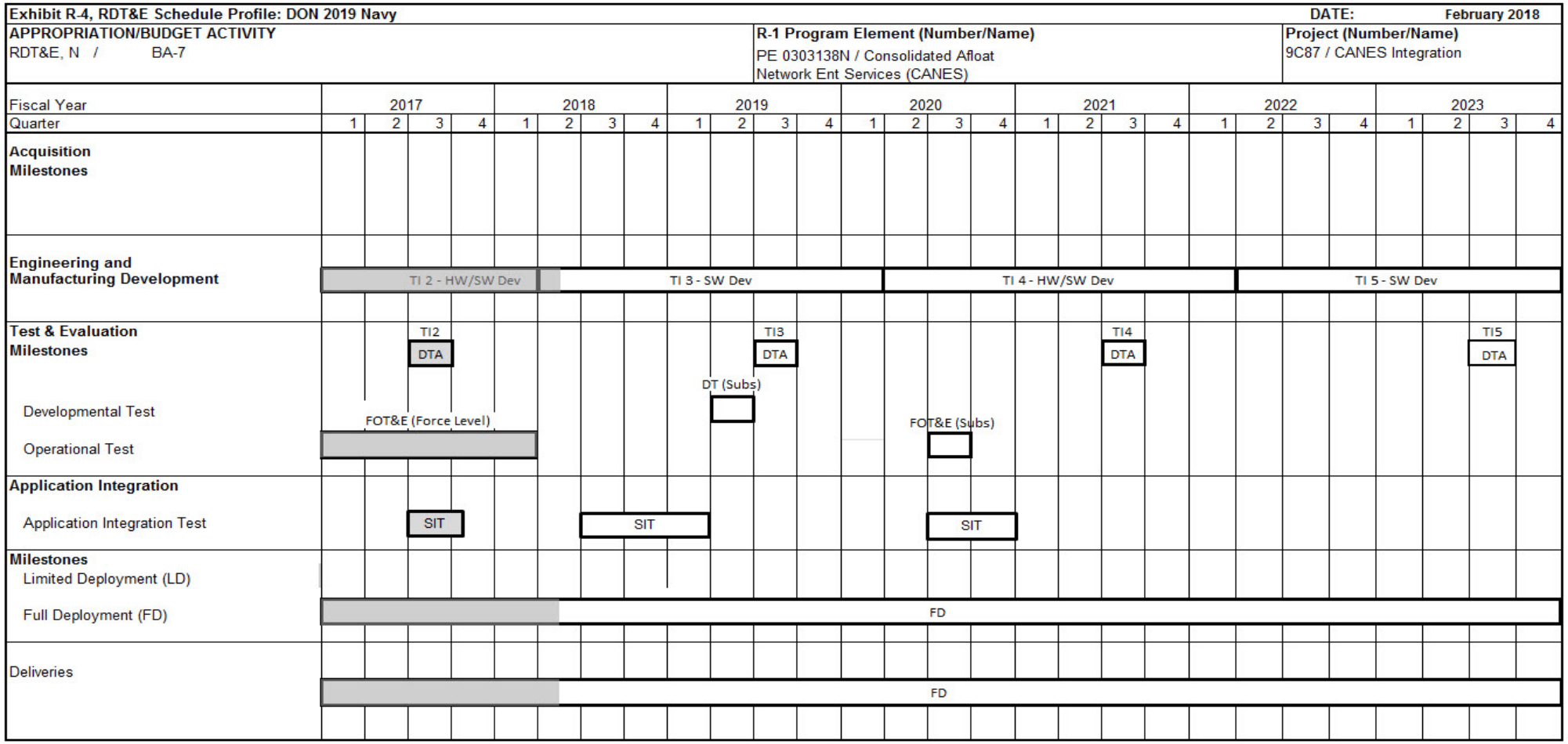
Management Services ($ in Millions)

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
Prior Year Management Services	Various	Various : Various	12.184	0.000		0.000		0.000		-		0.000	0.000	12.184	12.500
Program Management	C/CPFF	STF : San Diego, CA	0.000	0.055	Jan 2017	0.060	Dec 2017	0.058	Dec 2018	-		0.058	0.867	1.040	1.500
		Subtotal	12.184	0.055		0.060		0.058		-		0.058	0.867	13.224	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	179.639	23.224		24.271		23.697		-		23.697	350.834	601.665	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*



TI: Technical Insertion; DT: Development Testing; DTA: Development Testing Assist; FOT&E: Force Level Follow-On Test and Evaluation; SIT: Software Integration Test; FD: Full Deployment

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303138N / *Consolidated Afloat Network Ent Services(CANES)*	**Project (Number/Name)** 9C87 / *CANES Integration*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Fiscal Year				
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 2 Hardware (HW)/SW Development	1	2017	1	2018
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 3 SW Development	2	2018	1	2020
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 4 HW/SW Development	2	2020	1	2022
Engineering and Manufacturing Development: Platform: Engineering and Manufacturing Development - TI 5 SW Development	2	2022	4	2023
Test & Evaluation Milestone: Development Test: Development Test Assist- TI 2	3	2017	3	2017
Test & Evaluation Milestone: Development Test: Development Test Assist- TI 3	3	2019	3	2019
Test & Evaluation Milestone: Development Test: Development Test Assist- TI 4	3	2021	3	2021
Test & Evaluation Milestone: Development Test: Development Test Assist- TI 5	3	2023	3	2023
Test & Evaluation Milestone: Development Test: Developmental Test - Sub	2	2019	2	2019
Test & Evaluation Milestone: Operational Test: Operational Test Force Level - Follow-on Operational Test & Evaluation (FOT&E)	1	2017	1	2018
Test & Evaluation Milestone: Operational Test: Operational Test - FOT&E Sub	3	2020	3	2020
Application Integration: Application Integration SIT 1	3	2017	4	2017
Application Integration: Application Integration SIT 2	3	2018	1	2019
Application Integration: Application Integration SIT 3	3	2020	4	2020
Production Milestone: Full Deployment: Production Milestone - Full Deployment (FD)	1	2017	4	2023
Deliveries: Deliveries - Full Deployment (FD)	1	2017	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0303140N *I Information Sys Security 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	422.597	32.708	50.269	44.228	-	44.228	44.823	38.742	33.577	36.649	Continuing	Continuing
0734: *Communications Security R&D*	406.101	31.185	47.854	41.954	-	41.954	42.690	36.563	31.358	34.381	Continuing	Continuing
3230: *Information Assurance*	16.496	1.523	2.415	2.274	-	2.274	2.133	2.179	2.219	2.268	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Information Systems Security Program (ISSP) ensures the protection of Navy and Navy hosted joint telecommunication and Information Technology (IT) systems from cyber exploitation and attack. The ISSP extends cybersecurity to ensure confidentiality, integrity, and availability of these systems and content processed, stored, or transmitted therein by performing the acquisition, modernization and sustainment of cybersecurity platforms and systems; cyberspace operations include both defensive and offensive measures, which preserve the ability to protect data, networks, net-centric capabilities, and other designated systems while projecting power by the application of force in or through cyberspace. The ISSP includes the protection of the Navy's National Security Systems (NSS). The ISSP must be rapid, predictive, adaptive, and tightly coupled to cyberspace technology. The ISSP provides cybersecurity systems and infrastructure based on mission impacts, cybersecurity threats, information criticality, vulnerabilities, and required defensive countermeasure capabilities.

The ISSP focuses on efforts that address the risk management of cyberspace, which provides capabilities to protect, detect, restore and respond. The ISSP provides the Navy with the following cybersecurity elements: (1) defense of National Security Systems (NSS), including the Nuclear Command, Control, and Communications, Navy (NC3-N) system, naval weapons systems, critical naval infrastructure for Command, Control, Communications, Computers, & Intelligence (C4I) afloat and shore networks, joint time and navigation systems, and industrial control systems, using modern cryptographic solutions and cyber security tools; (2) technologies for the Navy's Computer Network Defense (CND) service provider that accelerates the Navy's ability to prevent, constrain, and mitigate cyber attacks and critical vulnerabilities; (3) Navy Cyber Situational Awareness (NCSA) technologies that provides the operational context for cyber threat intelligence and Situational Awareness (SA), from external boundaries to tactical edge infrastructures; (4) assurance of the Navy's Cryptography (Crypto) telecommunications infrastructure and the wireless spectrum; (5) sensing cyber threats across all Navy shore and afloat networks to expand the capabilities of monitoring, assessing, and detecting adversary activities across multiple enclaves through the collection of tools in SHARKCAGE; (6) alignment to Navy's Insider Threat program; (7) assurance of joint-user cyberspace domains, using a Defense-In-Depth (DiD) security architecture and its alignment with the Joint Information Environment (JIE)/Joint Regional Security Stack (JRSS); (8) assurance technologies, including Key Management (KM) and Public Key Infrastructure (PKI).

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 7: *Operational Systems Development*			R-1 Program Element (Number/Name) PE 0303140N *I Information Sys Security Program*		
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	38.510	50.269	53.013	-	53.013
Current President's Budget	32.708	50.269	44.228	-	44.228
Total Adjustments	-5.802	0.000	-8.785	-	-8.785
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.549	0.000			
• Program Adjustments	0.000	0.000	-8.202	-	-8.202
• Rate/Misc Adjustments	0.000	0.000	-0.583	-	-0.583
• Congressional General Reductions Adjustments	-0.053	-	-	-	-
• Congressional Directed Reductions Adjustments	-5.200	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by $0.704 million to account for the availability of prior year execution balances.

TECHNICAL: N/A

SCHEDULE:

Computer Network Defense (CND):
- Added Build 14 Development milestone. Starts in 3QFY22.

Navy Cryptography (Crypto):
- VINSON/Advanced Narrowband Digital Voice Terminal (ANDVT) Cryptographic Modernization (VACM) deliveries shifted from 1QFY18 to 2QFY18 in accordance with the United States Air Force (USAF) schedule.
- Advanced Cryptographic Capability (ACC) Fielding Decision added to Q4FY18 in accordance with the National Security Agency (NSA) schedule.
- KGV-11M Preliminary Design Review (PDR) shifted from 4QFY18 to 1QFY19, in accordance with the schedule.
- KGV-11M Development Test and Evaluation (DT&E) shifted from 2QFY20 to 1QFY20, in accordance with the 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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0303140N *I Information Sys Security Program*

Key Management (KM):
- Capability Increment (CI)-2 Spiral 2 Spin 3 Development, Integration and Test shifted from Q1FY18 to Q3FY17.
- CI-2 Spiral 2 Deliveries shifted from Q2FY18 to Q1FY18.

SHARKCAGE & Navy Cyber Situational Awareness (NCSA):
- SHARKCAGE and NCSA are Rapid Deployment Capability (RDC) efforts. An RDC is the Navy's implementation of the Department of Defense (DoD) 5000 defined "Accelerated Acquisition Program." It provides the ability to react immediately to a newly discovered enemy threat(s) or potential enemy threat(s) through tailored procedures, to allow for fielding of mature capabilities based on Commercial Off-The-Shelf (COTS) and Non-Developmental Item (NDI) products within a two year period. At the end of that period SHARKCAGE and NCSA are planned to transition to respective Acquisition Category (ACAT) programs.
- SHARKCAHE & NCSA RDC Delivery completion shifted from 4QFY19 to 3QFY19.
- SHARKCAGE & NCSA Transition Deliveries start shifted from 1QFY20 to 4QFY19.

FUNDING:

Navy Cryptography (Crypto):
- FY19 increase is for continued development of Advanced Cryptographic Capabilities (ACC) security software of various Communications Security (COMSEC) devices and compatibility of cryptographic devices capable of receiving software updates.

Key Management (KM):
- FY19 decrease aligns to the completion of CI-2 Spiral 2/Spin 3.

SHARKCAGE:
- FY19 decrease reflects a realignment within SHARKCAGE from Research, Development, Test and Evaluation (RDTE) to Other Procurement, Navy (OPN) and Operations and Maintenance, Navy (OMN) based on program requirements shifting from development to procurement, integration and sustainment.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0303140N / *Information Sys Security Program*				Project (Number/Name) 0734 / *Communications Security R&D*			
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**
0734: *Communications Security R&D*	406.101	31.185	47.854	41.954	-	41.954	42.690	36.563	31.358	34.381	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Information Systems Security Program (ISSP) Research Development Test & Evaluation (RDT&E) efforts extend our cybersecurity and resiliency, provide Defensive Cyberspace Operations (DCO), and cross domain solutions to protect data, Department of Defense (DoD) Information Networks (DoDIN), net-centric operations, the forward deployed, and other designated systems in order to protect cyberspace and critical warfighting capabilities.

This project includes a rapidly evolving development, design and application integration effort to modernize cryptographic equipment and ancillaries with state-of-the-art replacements to counter evolving and increasingly sophisticated threats. Communications Security (COMSEC) and Transmission Security (TRANSEC) are evolving from stand-alone, dedicated devices to embedded modules incorporating National Security Agency (NSA) approved cryptographic engines, loaded with the certified algorithms and keys, and interconnected via industry-defined interfaces. This includes the DoDIN capability requirements document for the development of Content Based Encryption (CBE).

Computer Network Defense (CND): The CND program provides cyberspace capabilities to secure the Cyber Domain. CND is a combination of hardware, software, sets of processes and protective measures that use computer networks to detect, monitor, protect, analyze and defend against network infiltrations resulting in service/network denial, degradation and disruptions. CND enables a government or military institute/organization to defend against network attacks perpetrated by malicious or adversarial computer systems or networks.

Navy Cryptography (Crypto): Navy Crypto modernizes legacy cryptographic equipment which includes families of COMSEC and TRANSEC devices that are divided into crypto voice, crypto data, crypto products and associated ancillary devices. These devices provide modern cryptographic solutions to replace obsolete, legacy devices within the crypto categories.

Key Management (KM): KM monitors and tracks capability verification testing, designs and tests capabilities to provide a net-centric web based architecture, for the ordering, management, and distribution of all cryptographic key material to support Navy users, to include integration of Intermediary Application (iApp).

Public Key Infrastructure (PKI): The DoD PKI program, under the authority of the Under Secretary of Defense for Acquisition, Technology, and Logistics (USD AT&L), develops and tests PKI equipment and is responsible for meeting statutory and regulatory requirements for the DoD PKI program. The Navy PKI program tests and implements products for afloat networks and shore non-Navy Marine Corps Intranet (NMCI) networks and institutionalizes Identity and Access Management (IdAM) so that person and non-person entities can securely access all authorized DoD resources.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

SHARKCAGE: SHARKCAGE is a global, federated DCO enclave consisting of shore sensor nodes, DCO analysis workbenches, and analytic suites. Utilizing one-way passive taps in a protected, isolated, classified environment, SHARKCAGE consolidates cyber event data from multiple platforms and networks, providing Navy DCO forces with a shared environment and common platform for integrated workflow, collaboration, and analysis. SHARKCAGE efficiently detects, correlates, and analyzes nation and non-nation state attacks against maritime Navy networks and the Naval Networking Environment (NNE).

Navy Cyber Situational Awareness (NCSA): NCSA is a command and control infrastructure that provides Navy commanders with timely, trusted, and comprehensive Situational Awareness (SA) of the cyberspace domain to include tailored, near real-time visualization of network health, vulnerabilities, and operational readiness through the correlation of data from multiple sources. NCSA combines asset data, baseline configuration data, and real-time threat data which is critical for defending a fully-interconnected network infrastructure. NCSA enables early threat detection and timely decision making.

Cybersecurity Services: Cybersecurity Services develop cyber architecture and provides cybersecurity engineering for the DoD and Department of the Navy (DoN) cybersecurity interests based on the requirements prioritized by Fleet Cyber Command/Commander Tenth Fleet (FCC/C10F). Cybersecurity Services transitions new technologies to address current Navy cybersecurity challenges.

FY19 will focus on efforts that address the risk management of cyberspace, which provides capabilities to protect, detect, restore and respond. The ISSP provides the Navy with the following cybersecurity elements: (1) defense of National Security Systems (NSS), including the Nuclear Command, Control, and Communications, Navy (NC3-N) system, naval weapons systems, critical naval infrastructure for Command, Control, Communications, Computers, & Intelligence (C4I) afloat and shore networks, joint time and navigation systems, and industrial control systems, using modern cryptographic solutions and cyber security tools; (2) technologies supporting the Navy's Computer Network Defense (CND) service provider that will help the Navy's ability to prevent, constrain, and mitigate cyber attacks and critical vulnerabilities; (3) Navy Cyber Situational Awareness (NCSA) technologies that provides the operational context for cyber threat intelligence and Situational Awareness (SA), from external boundaries to tactical edge infrastructures; (4) assurance of the Navy's Crypto telecommunications infrastructure and the wireless spectrum; (5) sensing cyber threats across all Navy shore and afloat networks to expand the capabilities of monitoring, assessing, and detecting adversary activities across multiple enclaves through the collection of tools in SHARKCAGE; (6) alignment to Navy's Insider Threat program; (7) assurance of joint-user cyberspace domains, using a Defense-In-Depth (DiD) security architecture and its alignment with the Joint Information Environment (JIE)/Joint Regional Security Stack (JRSS); (8) assurance technologies, including the Key Management (KM) and Public Key Infrastructure (PKI).

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Computer Network Defense (CND)	21.358	14.039	13.160	0.000	13.160
Articles:	-	-	-	-	-
FY 2018 Plans: SHARKCAGE and Navy Cyber Situational Awareness (NCSA) development efforts previously budgeted under CND have been broken out for greater visibility into cybersecurity.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

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 develop Navy's portion of the Nuclear Command, Control, and Communications, Navy (NC3-N) and Ballistic Missile Defense (BMD) cyber security system of systems within the Computer Network Defense (CND) architecture. Continue to develop, integrate, and test CND Inc 2 Builds, Defense-in-Depth (DiD), and Situational Awareness (SA) technologies for knowledge-empowered CND operations for shore sites and afloat platforms within Navy's Outside Continental United States (OCONUS) Navy Enterprise Network (ONE-Net) and Command, Control, Communication, Computers and Intelligence (C4I) networks to achieve improved network defense and security wholeness. Continue enhancing the Vulnerability Remediation Asset Manager (VRAM) tool per Fleet Cyber Command / Commander Tenth Fleet (FCC/C10F) and Naval Information Forces (NAVIFOR) requirements, to include Security Technical Implementation Guides (STIG) Reporting Integration, web services to share data between VRAM, cyber readiness databases and mission support systems to improve Department of Defense (DoD) cyber readiness. Continue to evaluate needs derived from stakeholders and the CND Capabilities Steering Group (CCSG), and correspondingly develop, update, and integrate CND suites. Continue to implement DoD and United States Cyber Command (USCC) cybersecurity tools and mandates into ONE-Net and C4I networks. Continue to provide technical guidance to support Consolidated Afloat Network and Enterprise Services (CANES) deployment of new CND capabilities. Begin to optimize CND suite for alignment with Joint Regional Security Stack (JRSS), including the transition of some capabilities from the CND suite into JRSS. Continue efforts to further virtualize CND capabilities for more effective and cost-efficient deployment of cybersecurity technologies. Continue to develop, integrate, and test solution to replace and assume acquisition management of Navy Cyber Defense Operations Command's (NCDOC) tactical sensor infrastructure. Begin development and alignment to Navy's Insider Threat program to identify possible insider threats across multiple enclaves in order to fulfill the Presidential, DoD, and Department of Navy (DoN) directives. ***FY 2019 Base Plans:*** Continue to develop Navy's portion of the Nuclear Command, Control, and Communications, Navy (NC3-N)and Ballistic Missile Defense (BMD) cyber security system of systems within the CND architecture. Continue to develop, integrate, and test Computer Network Defense (CND) Inc 2 Builds, Defense-in-Depth (DiD), and Situational Awareness (SA) technologies for knowledge-empowered CND operations for shore sites and afloat platforms within Navy's ONE-Net and C4I networks to achieve improved network defense and security wholeness. Continue enhancing the Vulnerability Remediation Asset Manager (VRAM) tool, to include STIG Reporting Integration, web services to share data between VRAM, cyber readiness databases and mission support systems to improve DoD cyber readiness. Continue to evaluate needs derived from stakeholders and the CND Capabilities Steering Group (CCSG), and correspondingly develop, update, and integrate CND suites. Continue to implement DoD and United States Cyber Command (USCC) cybersecurity tools and mandates					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
into ONE-Net and C4I networks. Continue to provide technical guidance to support CANES deployment of new CND capabilities. Continue to optimize CND suite for alignment with JRSS, including the transition of some capabilities from the CND suite into JRSS. Continue efforts to further virtualize CND capabilities for more effective and cost-efficient deployment of cybersecurity technologies. Continue to develop, integrate, and test solution to replace and assume acquisition management of NCDOC's tactical sensor infrastructure. Continue development and alignment to Navy's Insider Threat program to identify possible insider threats across multiple enclaves in order to fulfill the Presidential, DoD, and DoN directives. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant changes from FY18 to FY19					
Title: Navy Cryptography (Crypto)	4.672	11.912	13.565	0.000	13.565
Articles:	-	-	-	-	-
FY 2018 Plans: FY18 increase will modernize common software for Transmission Security (TRANSEC), including the KGV-11M crypto core, based on the THORNTON TRANSEC Algorithm Modernization (TTAM). Specification algorithm modernization is mandated by Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6510 to meet mandated National Security Agency (NSA) cease key dates. The TRANSEC algorithm modernization mandate protects critical Ultra High Frequency (UHF) circuits from unauthorized access, spoofing, and denial of service. Complete contract award for development of KGV-11M TRANSEC End Cryptographic Units (ECU). Develop a transition plan for TRANSEC and Advanced Cryptographic Capabilities (ACC)-based devices to support crypto modernization. Continue TRANSEC replacement product development and continue developmental testing, focusing on the KGV-11M device. Continue to provide development and security engineering for modernization of Department of the Navy (DoN) crypto systems and embeddable crypto modernization strategies. Continue to work with NSA on certification authority, acquisition authority and data testing for all crypto modernization efforts. Continue to investigate impacts of upcoming NSA security enhancements for crypto modernization products. Continue ACC solutions development and testing across multiple products. Conduct test and evaluation on new software capabilities for crypto modernization products. Continue modernization of VINSON/Advanced Narrowband Digital Voice Terminal (ANDVT) Cryptographic Modernization (VACM) ancillary devices. Continue					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
to develop Navy strategy and implementation plan to modernize secure voice architectures within Navy networks. ***FY 2019 Base Plans:*** FY19 increase is for continued development of Advanced Cryptographic Capabilities (ACC) security software of various Communications Security (COMSEC) devices and compatibility of cryptographic devices capable of receiving software updates. Continue developing a transition plan for Transmission Security (TRANSEC) and Advanced Cryptographic Capabilities (ACC) for crypto modernization. Continue KGV-11M product development and continue developmental testing. Complete KGV-11M Preliminary Design Review (PDR). Complete KGV-11M Critical Design Review (CDR). Continue to provide development and security engineering for modernization of DoN crypto systems and embeddable crypto modernization strategies. Continue to work with NSA on certification authority and data testing for all crypto modernization efforts. Continue to investigate impacts of upcoming NSA security enhancements for crypto modernization products. Continue to enhance and modernize VINSON/Advanced Narrowband Digital Voice Terminal (ANDVT) Cryptographic Modernization (VACM) ancillary devices. Continue to develop Navy strategy and implementation plan to modernize secure voice architectures within Navy networks. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 increase is for continued development of Advanced Cryptographic Capabilities (ACC) security software of various Communications Security (COMSEC) devices and compatibility of cryptographic devices capable of receiving software updates.					
Title: Key Management (KM)	2.363	2.230	0.823	0.000	0.823
Articles:	-	-	-	-	-
FY 2018 Plans: Achieve Full Operational Test & Evaluation (FOT&E) and Full Deployment Decision (FDD) for Key Management Infrastructure (KMI) Spiral 2. Continue migrating Continue migrating Communications Security (COMSEC) Management Workstation (CMWS) and the follow on to Simple Key Loader (SKL) into the KMI environment. Initiate the development, engineering, and testing of KMI Capability Increment (CI)-3, including the integration					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
of the Intermediary Application (iApp) within a network environment, which will enhance the accounting for and distribution of KMI key delivery. ***FY 2019 Base Plans:*** Continue migrating COMSEC CMWS and the follow on to SKL into the KMI environment. Continue the development, engineering and testing of KMI CI-3, including the integration of iApp within a network environment, which will enhance the accounting for and distribution of KMI key delivery. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease aligns to the completion of Capability Increment (CI)-2 Spiral 2/Spin 3.					
Title: Public Key Infrastructure (PKI)	0.350	0.360	0.366	0.000	0.366
Articles:	-	-	-	-	-
FY 2018 Plans: Continue Navy compliance and compatibility with Department of Defense (DoD) Public Key Infrastructure (PKI) implementation, cryptographic algorithms and development efforts, to include Computer Network Defense (CND), Elliptic Curve Cryptography (ECC), Secure Hash Algorithms (SHA-256) and other encryption methodologies, Navy Certificate Validation Infrastructure (NCVI), Common Access Card (CAC), Alternate Logon Token (ALT), and Alternate Logon Token (SIPRNet) Token. Continue research, test and evaluation of Non-classified Internet Protocol Router Network (NIPRNet) Enterprise Alternate Token System (NEATS), Non-Person Entity (NPE), PKI authentication capabilities to support mobile devices, Identity and Access Management (IdAM) technologies, and Real-time Automated Personnel Identification System (RAPIDS) Operating Systems (OS). ***FY 2019 Base Plans:*** Continue Navy compliance and compatibility with DoD PKI implementation, cryptographic algorithms and development efforts, to include CND, ECC, SHA-256 and other encryption methodologies, NCVI, CAC, ALT, and SIPRNet Token. Continue research, test and evaluation of NEATS, NPE, PKI authentication capabilities to support mobile devices, IdAM technologies, and RAPIDS OS. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
No significant changes from FY18 to FY19					
Title: SHARKCAGE	0.000	8.973	5.322	0.000	5.322
Articles:	-	-	-	-	-

FY 2018 Plans:
SHARKCAGE development efforts were previously budgeted under Computer Network Defense (CND); funding broken out for greater visibility into cybersecurity.

FY18 funds SHARKCAGE development efforts to provide Defensive Cyber Operations (DCO) forces with the ability to detect adversary activities and analyze cyber attacks against Navy networks via protected, isolated networks, and integrate intelligence and Navy data to assess potential cyber threats. SHARKCAGE will provide the capability to analyze active cyber threats and take actions to contain/stop threat activities. The data that is collected and analyzed via SHARKCAGE is presented and visualized via the Navy Cyber Situational Awareness (NCSA) capability. Continue development of SHARKCAGE DCO enclave to address new requirements from the fleet in light of emerging threats in the tactical environment. Development efforts include network taps, sensors, and analytic toolsets for passively monitoring multiple Navy shore and afloat networks and enclaves (e.g., Command, Control, Communications, Computers and Intelligence (C4I) networks, Combat Systems (CS), Hull, Mechanical, and Electrical (HM&E), etc.) to detect and assess cyber threats across multiple security enclaves. Continue development of event collection and analysis components for shore sensor nodes and afloat flyaway kits for deployed Cyber Protection Teams (CPT).

FY 2019 Base Plans:
Continue development of SHARKCAGE DCO enclave to address requirements from the fleet in light of emerging threats in the tactical environment. Development efforts include network taps, sensors, and analytic toolsets for passively monitoring multiple Navy shore and afloat networks and enclaves (e.g., C4I networks, CS, HM&E, etc.) to detect and assess cyber threats across multiple security enclaves. Continue development of event collection and analysis components for shore sensor nodes and afloat flyaway kits for deployed CPT.

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 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
FY19 decrease reflects a realignment within SHARKCAGE from Research, Development, Test and Evaluation (RDTE) to Other Procurement, Navy (OPN) and Operations and Maintenance, Navy (OMN) based on program requirements shifting from development to procurement, integration and sustainment.					
Title: Navy Cyber Situational Awareness (NCSA)	0.000	7.840	6.356	0.000	6.356
Articles:	-	-	-	-	-
FY 2018 Plans: Navy Cyber Situational Awareness (NCSA) development efforts were previously budgeted under Computer Network Defense (CND); funding broken out for greater visibility into cybersecurity. FY18 funds NCSA development activities that provide Navy forces near real-time cyber risk and readiness information of Navy networks and their associated mission impacts across the Navy enterprise as an enabler of assured Command and Control (C2). NCSA receives cyber threat analysis from SHARKCAGE. As a result, operational level of war cyber situational awareness will be provided to Fleet Cyber Command (FCC) and Navy Geographic Maritime Operations Centers (MOC) through visualization capabilities via web-accessible cyber Common Operational Pictures (COP) established through the correlation of relevant cyber data sources; combining asset data, baseline configuration data, event data, and real-time threat data critical for defending Navy networks and Navy network infrastructure. Continue development and maturation of NCSA capabilities to address new requirements from the fleet in light of emerging threats in the tactical environment. Development efforts will include the integration of all-source intelligence with Navy maritime data to enable early threat detection, and assessment of adversary activities and capabilities, intent, and access to critical Navy networks. NCSA development efforts will provide a shared and tailorable Maritime Cyber "Integrated" COP external to FCC/Commander Tenth Fleet (C10F) beginning with Commander, Pacific Fleet (COMPACFLT) MOC to enable assessments of cyber vulnerabilities, threats, and risks relative to Ballistic Missile Defense (BMD) and Nuclear Command, Control, and Communications, Navy (NC3-N) missions. NCSA's maturation will provide for monitoring of relevant and current Navy networks providing near real-time visualization and analytics of the cyberspace domain. ***FY 2019 Base Plans:*** Continue the integration of all-source intelligence with Navy maritime data to enable early threat detection, and assessment of adversary activities and capabilities, intent, and access to critical Navy networks. Continue the development of a shared and tailorable Maritime Cyber "Integrated" COP external to FCC/C10F beginning with COMPACFLT MOC to enable assessments of cyber vulnerabilities, threats, and risks relative to BMD and NC3-					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
N missions. NCSA maturation will provide for monitoring of relevant and current Navy networks providing near real-time visualization and analytics of the cyberspace domain. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 decrease reflects a realignment within NCSA from Research, Development, Test and Evaluation (RDTE) to Operations and Maintenance, Navy (OMN) based on program requirements.					
Title: Cybersecurity Services	2.442	2.500	2.362	0.000	2.362
Articles:	-	-	-	-	-
FY 2018 Plans: Continue coordination and alignment with Joint Information Environment (JIE) (e.g., Joint Regional Security Stack (JRSS), Joint Management System (JMS), etc.) to ensure Navy architecture requirements for tactical networks are met. Continue to provide security systems engineering support for the development of Department of Defense (DoD) and Department of Navy (DoN) cybersecurity architectures and the transition of new technologies to address Navy cybersecurity challenges. Continue to provide updates to reflect emerging priorities and address Navy specific threats. Continue to coordinate cybersecurity activities across the virtual System Command (SYSCOM) via the Cybersecurity Trusted Architecture (TA) to ensure the security design and integration of cybersecurity products and services is consistent across the Navy for major initiatives such as the future afloat, ashore, and Outside of the Continental United States (OCONUS) networks. Continue to provide cybersecurity risk analysis and recommended risk mitigation strategies for Navy critical networks and Command, Control, Communication, Computers, & Intelligence (C4I) systems. Continue to coordinate with the Navy acquisition community to ensure cybersecurity requirements are identified and addressed within the development cycles for emerging Navy network and C4I capabilities. Continue to evaluate products for security issues and develop guidance and procedures for the design and integration of risk mitigation strategies via appropriate cybersecurity controls. ***FY 2019 Base Plans:*** Continue coordination and alignment with JIE (e.g., JRSS, JMS, Tactical Processing Node (TPN) etc.) to ensure Navy architecture requirements for tactical networks are met. Continue to provide security systems engineering support for the development of DoD and DoN cybersecurity architectures and the transition of new technologies to address Navy cybersecurity challenges. Continue to provide updates to reflect emerging priorities and address Navy specific threats. Continue to coordinate cybersecurity activities across the virtual SYSCOM via					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
the Cybersecurity TA to ensure the security design and integration of cybersecurity products and services is consistent across the Navy for major initiatives such as the future afloat, ashore, and OCONUS networks. Continue to provide cybersecurity risk analysis and recommended risk mitigation strategies for Navy critical networks and C4I systems. Continue to coordinate with the Navy acquisition community to ensure cybersecurity requirements are identified and addressed within the development cycles for emerging Navy network and C4I capabilities. Continue to evaluate products for security issues and develop guidance and procedures for the design and integration of risk mitigation strategies via appropriate cybersecurity controls. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant changes from FY18 to FY19					
Accomplishments/Planned Programs Subtotals	31.185	47.854	41.954	0.000	41.954

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/3415: *Info Sys Security Program (ISSP)*	92.454	89.663	153.526	-	153.526	169.790	167.008	164.884	171.918	Continuing	Continuing

Remarks

D. Acquisition Strategy

Computer Network Defense (CND): The CND Acquisition Category (ACAT) IVM program is a layered protection strategy, which militarizes Commercial Off-The-Shelf (COTS) and integrates Government Off-The-Shelf (GOTS) hardware and software products that collectively provide an effective network security infrastructure. The rapid advancement of cyber technology requires an efficient process for updating CND tools deployed to afloat and shore platforms. Recognizing the need for future CND capability improvements, the CND program implements an evolutionary acquisition strategy that delivers CND capabilities in multiple builds and functionality releases that address validated requirements.

Navy Cryptography (Crypto): Modernized crypto devices will replace legacy crypto in accordance with the mandate by Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6510 as well as the National Security Agency (NSA) planned decertification, which improves the Navy's cyber defense posture. For Advanced Cryptographic Capability (ACC) the acquisition strategy will follow the NSA direction on mandated software upgrades. The planned KGV-11M program will be led by the Navy.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

Key Management (KM): Key Management Infrastructure (KMI) is a NSA-led ACAT I program. It is the next generation Electronic Key Management System (EKMS) that provides the infrastructure for management, ordering and distribution of key material as well as directly supporting the key requirements of all Crypto modernization efforts. KMI will follow an increment/spiral development strategy. The KMI program will continue to develop alternative architecture implementations for communities within the Navy to implement the Intermediary Application (iApp) as a KM solution.

Public Key Infrastructure (PKI): Department of Defense (DoD) PKI is an ACAT I program jointly led by the NSA and the Defense Information Systems Agency (DISA). The Under Secretary of Defense for Acquisition, Technology and Logistics (USD AT&L) is the Milestone Decision Authority (MDA). The Navy PKI project supports the DoD-wide implementation of PKI products and services across Navy afloat, non-Navy Marine Corps Intranet (NMCI), Outside the Continental United States (OCONUS) networks and other excepted networks.

SHARKCAGE: The SHARKCAGE Rapid Deployment Capability (RDC) effort will integrate COTS and GOTS hardware and software products to monitor multiple Navy networks and enclaves to detect, analyze, and assess threats. SHARKCAGE will provide Navy Cyber Defense Operations Command (NCDOC), Navy Information Operations Centers (NIOC), Fleet Cyber Command/Commander Tenth Fleet (FCC/C10F), Cyber Protection Teams (CPT), and other CND deployers with a global Defensive Cyberspace Operations (DCO) enclave to monitor the Naval Networking Environment (NNE) and maritime Navy networks, including Navy shore sites and afloat platforms conducting Ballistic Missile Defense (BMD) and Nuclear Command, Control, and Communications, Navy (NC3-N) missions.

Navy Cyber Situational Awareness (NCSA): The NCSA RDC effort will integrate COTS and GOTS hardware and software products to provide visualization of Navy networks and enclaves to analyze and assess mission threats. NCSA will be implemented via an evolutionary acquisition approach using an iterative, agile software enhancement process in the form of capability drops to address future cyber Situation Awareness (SA) capabilities and improvements required by fleet warfighters. These government-led agile software enhancements will be documented and managed through a requirements governance board process.

Cybersecurity Services: Cybersecurity Services is a Navy project, which develops cyber architecture and provides security engineering for the DoD and Department of the Navy (DoN) cybersecurity interests based on the requirements prioritized by Fleet Cyber Command/Commander Tenth Fleet (FCC/C10F). Cybersecurity Services transitions new technologies to address current Navy cybersecurity challenges.

E. Performance Metrics

Computer Network Defense (CND):

* Provide the ability to protect from, react to, and restore operations after an intrusion or other catastrophic event through validated contingency plans for 100% of CND systems.
* Develop dynamic security defense capabilities, based on the CND posture as an active response to threat attack sensors and vulnerability indications to provide adequate defenses against subversive acts of trusted people and systems, both internal and external, by integration of anomaly-based detection solutions into the design solutions for 100% of authorized Navy enclaves.
* Defend against the unauthorized use of a host or application, particularly operating systems, by development and/or integration of host-based intrusion prevention system design solutions for 100% of authorized Navy enclaves.

Navy Cryptography (Crypto):

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

* Meet 100% of Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6510 Cryptographic Modernization (CM) requirements within the current Fiscal Year Defense Plan (FYDP) by conducting a gap analysis and building a CM roadmap and implementation plan to allow Naval Information Forces (NAVIFOR) to establish operational priorities based on risk assessments. The gap analysis is an effort to analyze current integrated legacy cryptographic devices within the Department of the Navy (DoN) inventory with known algorithm vulnerability dates, assess lifecycle sustainment issues, and identify transition device schedules, where they exist.
* Meet 100% of Top Secret (TS) and SECRET CJCSI 6510 requirements by fielding modern cryptographic devices or request "key extension" via the Joint Staff Military Command, Control, Communications, and Computers Executive Board (MC4EB).
* Increase the functionality of cryptographic devices by replacing two legacy cryptographic devices with one modern device, where possible, identify, and implement modern small form factor, multi-channel cryptography devices.

Key Management (KM):
* Meet 100% of DoN, US Coast Guard (USCG) key management requirements. USCG and Military Sealift Command (MSC) replace existing Electronic Key Management System (EKMS) Tier 2 systems with a Key Management Infrastructure (KMI) Intermediary Application (iApp). Littoral Combat Ship (LCS) implements iApp to automate key deliver to the platforms.
* Incorporate 100% of the Communication Security (COMSEC) Manager Workstation (CMWS) requirements into the iApp baseline to meet KMI Capability Increment (CI)-2 and KMI CI-3 capabilities.

Public Key Infrastructure (PKI):
* Provide integration support to ensure Navy networks and programs of record comply with Department of Defense (DoD) PKI requirements on Non-classified Internet Protocol Router Network (NIPRNet) and Secret Internet Protocol Router Network (SIPRNet), per DoD Instruction 8520.02.
* Ensure 100% interoperability with DoD and Federal partners by researching and evaluating enhanced cryptographic algorithms and DoD PKI certificate changes.

SHARKCAGE:
* Deliver a global Defensive Cyberspace Operations (DCO) enclave that conducts monitoring and analysis of network traffic and event data to detect, correlate, and assess cyber threats to the Naval Networking Environment (NNE).
* Continue to develop and enhance SHARKCAGE capabilities in order to meet the Navy Cyber Situational Awareness Urgent Operational Need (UON) as defined by Fleet Cyber Command/Commander Tenth Fleet (FCC/C10F).

Navy Cyber Situational Awareness (NCSA):
* Deliver a maritime Cyber Common Operational Picture (COP) tailored to a fleet Maritime Operations Center (MOC) area of responsibility to provide operational impacts based on cyber events.
* Continue to develop and enhance NCSA capabilities in order to meet the NCSA UON as defined by FCC/C10F.

Cybersecurity Services:
* Ensure 100% interoperability and application of commercial standards compliance for Information Systems Security Program (ISSP) products by researching and conducting selective evaluations, integrating and testing Commercial Off-The-Shelf (COTS)/Non-Developmental Item cybersecurity products. Evaluation may include

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

defensible network boundary capabilities such as firewalls, secure routers and switches, guards, Virtual Private Networks (VPN), and network Intrusion Prevention Systems (IPS).

* Provide 100% of the services delineated in OPNAVINST 5239.1C by serving as the Navy's cybersecurity technical lead by developing cybersecurity risk analysis and recommended risk mitigation strategies for critical Navy networks and Command, Control, Communications, Computers, and Intelligence (C4I) systems.
* Coordinate cybersecurity activities across the Navy Enterprise via the Cybersecurity Trusted Architecture (TA) to measure effectiveness of Navy networks. Ensure the security design and integration of Computer Adaptive Network Defense-in-Depth (CANDiD) products and services and that they are 100% interoperable and operationally acceptable across the Navy for major initiatives such as the future afloat, ashore, and Outside the Continental United States (OCONUS) networks.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303140N / *Information Sys Security Program*	Project (Number/Name) 0734 / *Communications Security R&D*

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)	WR	SSC PAC : San Diego, CA	9.976	2.232	Oct 2016	2.953	Oct 2017	2.750	Oct 2018	-		2.750	Continuing	Continuing	Continuing
Hardware Development	C/CPFF	SSC PAC : San Diego, CA	2.816	0.560	Dec 2016	0.869	Dec 2017	0.809	Dec 2018	-		0.809	Continuing	Continuing	Continuing
Hardware Development (WR)	WR	SSC LANT : Charleston, SC	4.805	0.269	Oct 2016	0.570	Oct 2017	0.531	Oct 2018	-		0.531	Continuing	Continuing	Continuing
Hardware Development	C/CPFF	SSC LANT : Charleston, SC	1.255	0.504	Jan 2017	1.068	Jan 2018	0.995	Jan 2019	-		0.995	Continuing	Continuing	Continuing
Software Development (WR)	WR	SSC PAC : San Diego, CA	18.198	5.520	Oct 2016	9.781	Oct 2017	7.746	Oct 2018	-		7.746	Continuing	Continuing	Continuing
Software Development	C/CPFF	SSC PAC : San Diego, CA	3.695	2.998	Dec 2016	5.610	Dec 2017	5.040	Dec 2018	-		5.040	Continuing	Continuing	Continuing
Software Development (WR)	WR	SSC LANT : Charleston, SC	4.259	2.253	Oct 2016	2.232	Oct 2017	2.079	Oct 2018	-		2.079	Continuing	Continuing	Continuing
Software Development	C/CPFF	SSC LANT : Charleston, SC	5.349	3.956	Jan 2017	4.138	Jan 2018	3.854	Jan 2019	-		3.854	Continuing	Continuing	Continuing
Software Development	FFRDC	MITRE : McLean, VA	1.371	1.451	Dec 2016	2.022	Dec 2017	1.883	Dec 2018	-		1.883	Continuing	Continuing	Continuing
Software Development	Various	Various : Various	66.737	0.251	Dec 2016	0.532	Dec 2017	0.495	Dec 2018	-		0.495	Continuing	Continuing	Continuing
Software Development	C/CPFF	BAH : San Diego, CA	3.187	2.539	Jan 2017	2.801	Jan 2018	2.609	Jan 2019	-		2.609	Continuing	Continuing	Continuing
Software Development	FFRDC	GTRI : Atlanta, GA	6.228	2.593	Jan 2017	7.873	Jan 2018	6.266	Jan 2019	-		6.266	Continuing	Continuing	Continuing
Software Development	WR	NSMA : San Diego, CA	0.805	1.308	Dec 2016	1.631	Dec 2017	1.519	Oct 2018	-		1.519	Continuing	Continuing	Continuing
Software Development	WR	NRL : Washington DC	1.260	0.895	Dec 2016	0.903	Dec 2017	0.841	Oct 2018	-		0.841	Continuing	Continuing	Continuing
Development (PY)	Various	Various : Various	190.205	0.000		0.000		0.000		-		0.000	0.000	190.205	-
		Subtotal	320.146	27.329		42.983		37.417		-		37.417	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

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
Architecture	WR	Various : Various	5.417	0.246	Oct 2016	0.248	Oct 2017	0.231	Oct 2018	-		0.231	Continuing	Continuing	Continuing
Architecture	WR	SSC LANT : Charleston, SC	1.571	0.458	Oct 2016	0.473	Oct 2017	0.441	Oct 2018	-		0.441	Continuing	Continuing	Continuing
Studies & Design	WR	Various : Various	6.059	0.196	Oct 2016	0.415	Oct 2017	0.387	Oct 2018	-		0.387	Continuing	Continuing	Continuing
Requirements Analysis	C/CPFF	BAH : San Diego, CA	5.651	0.196	Oct 2016	0.416	Jan 2018	0.387	Jan 2019	-		0.387	Continuing	Continuing	Continuing
		Subtotal	18.698	1.096		1.552		1.446		-		1.446	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
System DT&E	WR	SSC PAC : San Diego, CA	37.635	0.330	Oct 2016	0.333	Oct 2017	0.310	Oct 2018	-		0.310	Continuing	Continuing	Continuing
System DT&E	WR	COTF : Norfolk, VA	0.837	0.470	Dec 2016	0.729	Dec 2017	0.679	Dec 2018	-		0.679	Continuing	Continuing	Continuing
System DT&E	C/CPFF	BAH : San Diego, CA	0.510	0.850	Dec 2016	0.858	Jan 2018	0.799	Jan 2019	-		0.799	Continuing	Continuing	Continuing
		Subtotal	38.982	1.650		1.920		1.788		-		1.788	Continuing	Continuing	N/A

Management Services ($ in Millions)

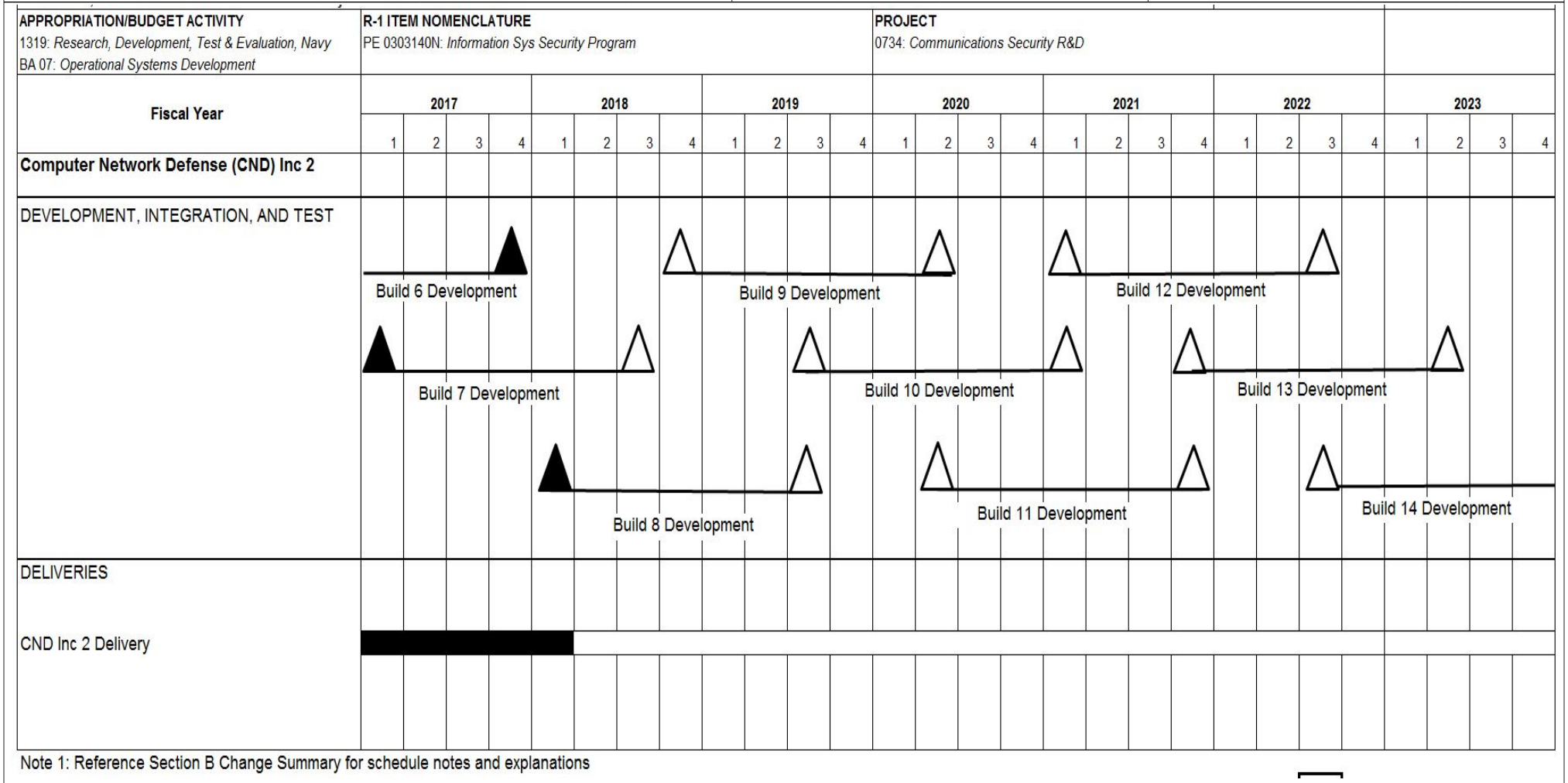
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	C/CPFF	BAH : San Diego, CA	28.275	1.110	Dec 2016	1.399	Jan 2018	1.303	Jan 2019	-		1.303	0.000	32.087	-
		Subtotal	28.275	1.110		1.399		1.303		-		1.303	0.000	32.087	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	406.101	31.185		47.854		41.954		-		41.954	Continuing	Continuing	N/A

Remarks

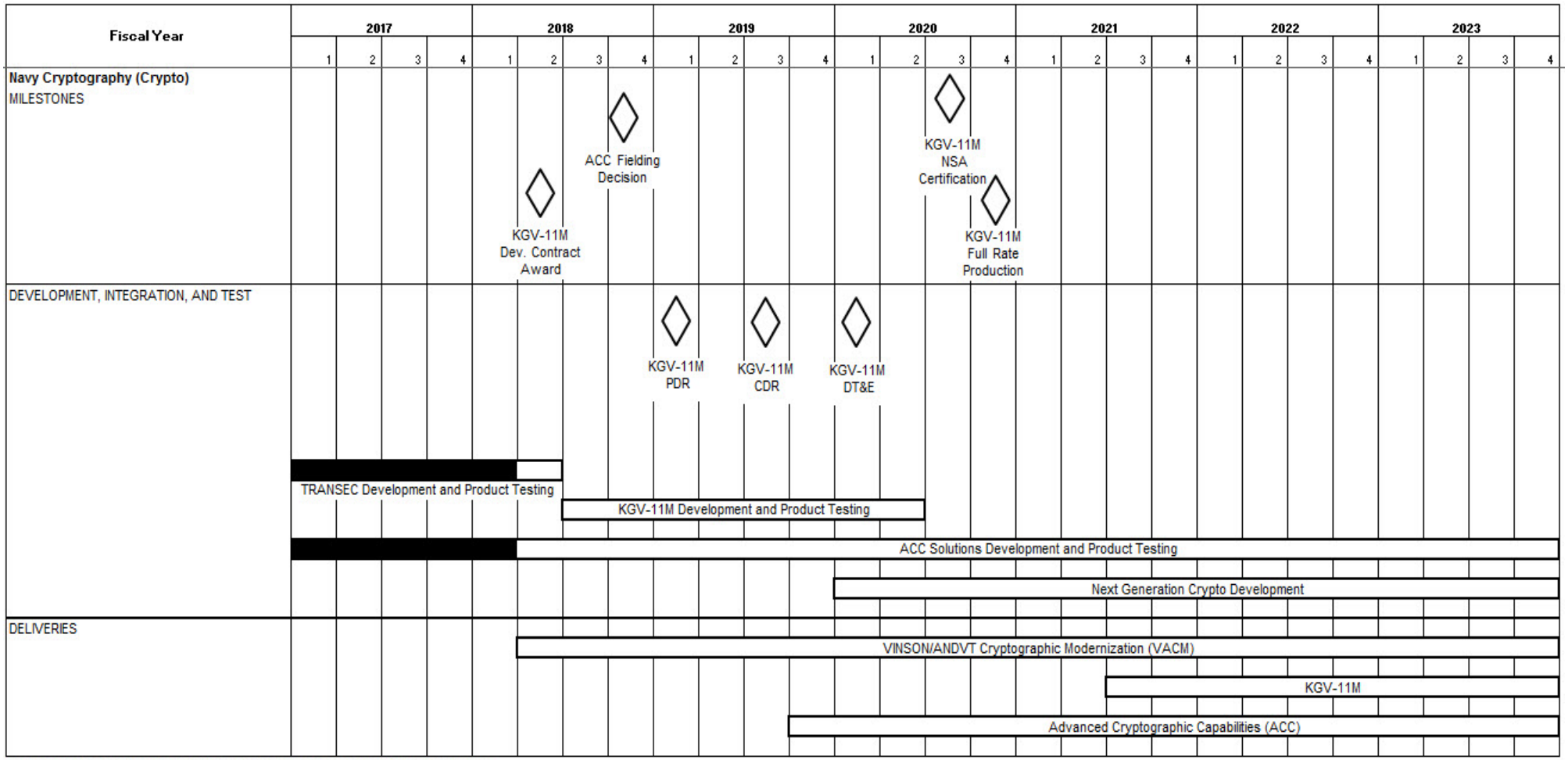
Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	PROJECT
1319: *Research, Development, Test & Evaluation, Navy* BA 07: *Operational Systems Development*	PE 0303140N: *Information Sys Security Program*	0734: *Communications Security R&D*



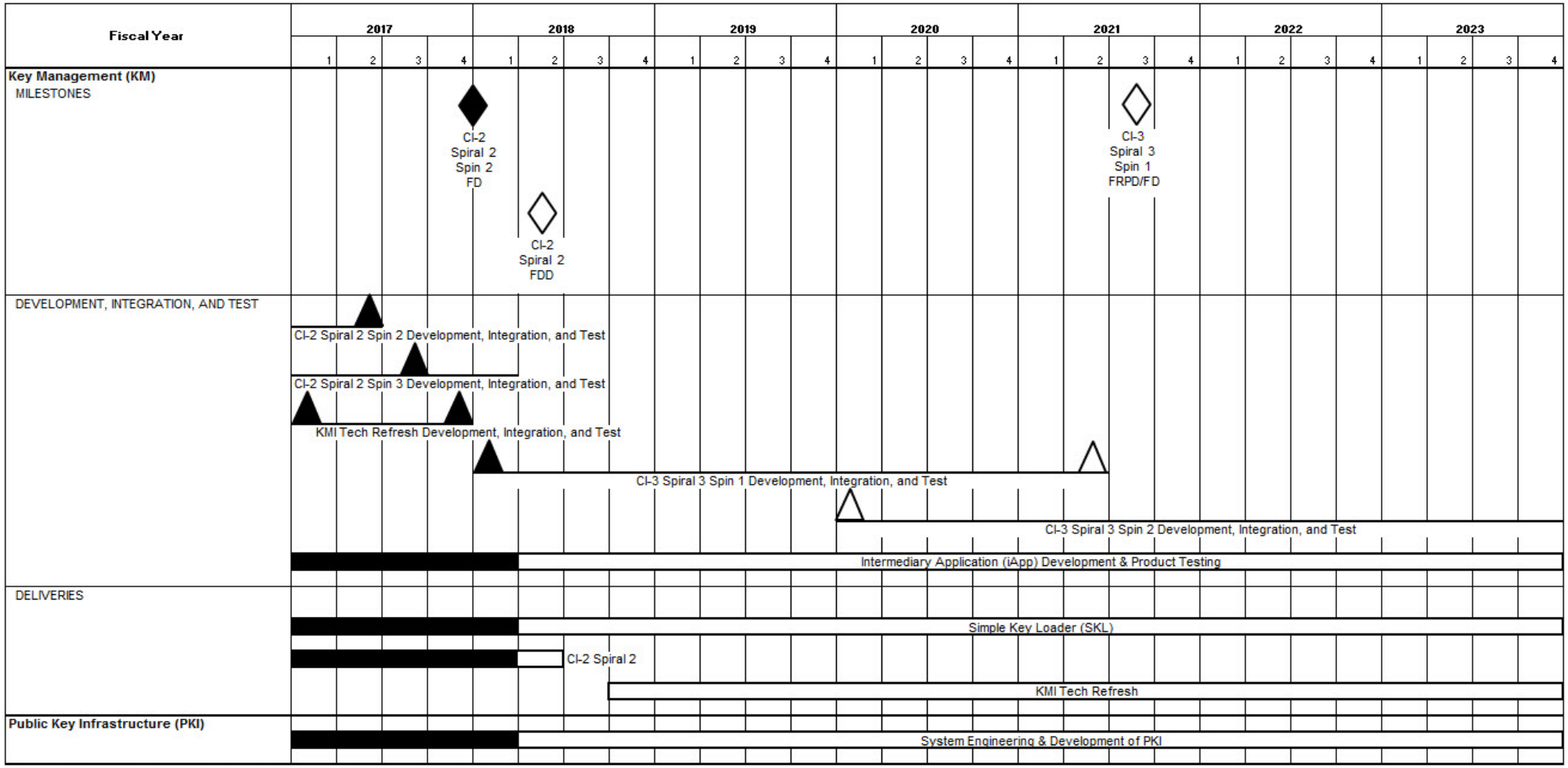
Note 1: Reference Section B Change Summary for schedule notes and explanations

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*



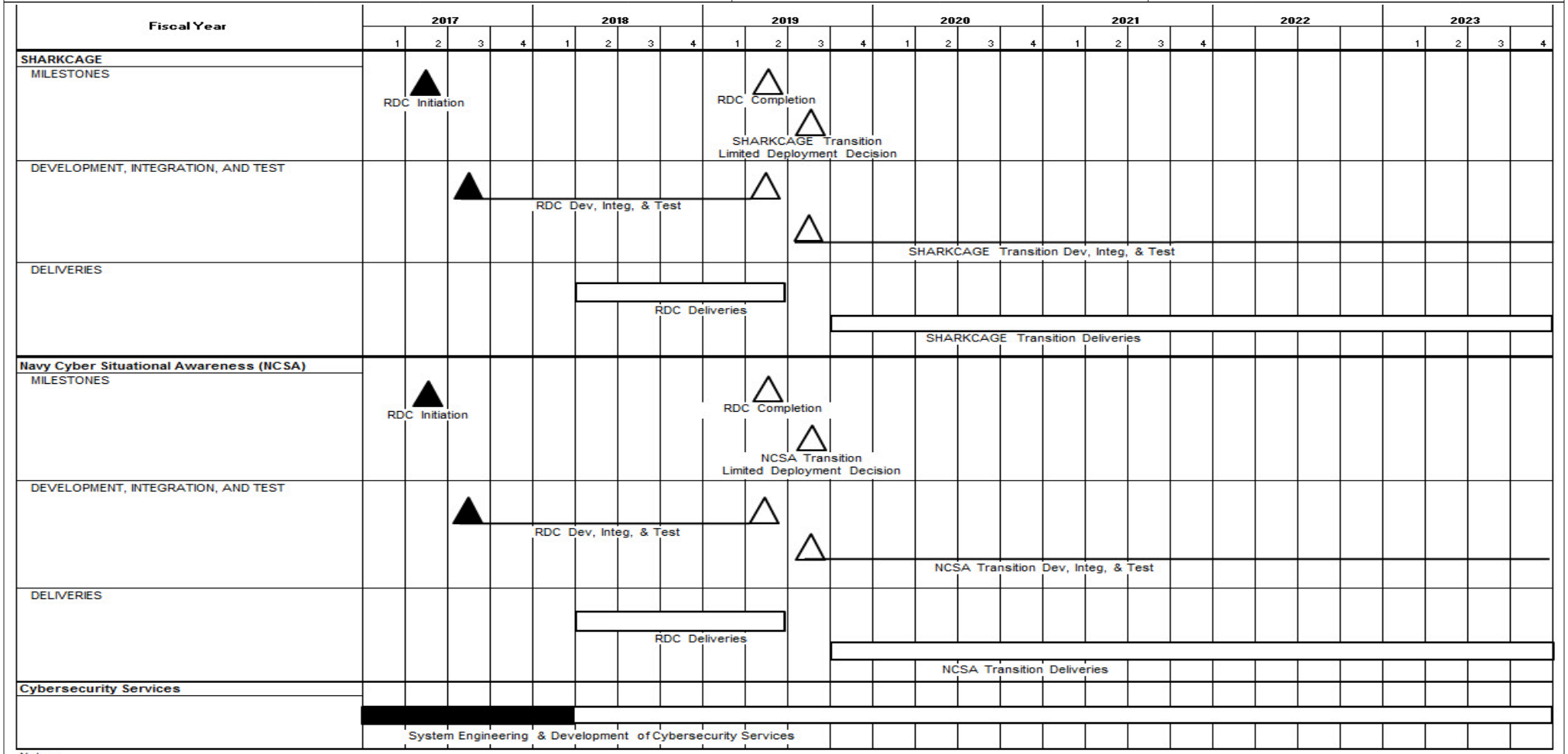
Note 1: Reference Section B Change Summary for schedule notes and explanations

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*



Note 1: Reference Section B Change Summary for schedule notes and explanations

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*



Notes:
1. Reference Section B Change Summary for schedule notes and explanations

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0734				
Computer Network Defense (CND) - Build 6 Dev, Integ, & Test	1	2017	4	2017
CND - Build 7 Dev, Integ, & Test	1	2017	3	2018
CND - Build 8 Dev, Integ, & Test	1	2018	3	2019
CND - Build 9 Dev, Integ, & Test	4	2018	2	2020
CND - Build 10 Dev, Integ, & Test	3	2019	1	2021
CND - Build 11 Dev, Integ, & Test	2	2020	4	2021
CND - Build 12 Dev, Integ, & Test	1	2021	3	2022
CND - Build 13 Dev, Integ, & Test	4	2021	2	2023
CND - Build 14 Dev, Integ, & Test	3	2022	4	2023
CND - Inc 2 Deliveries	1	2017	4	2023
Crypto - TRANSEC Development and Product Testing	1	2017	2	2018
Crypto - KGV-11M Development and Product Testing	3	2018	2	2020
Crypto - ACC Solutions Development and Product Testing	1	2017	4	2023
Crypto - Next Generation Crypto Development	1	2020	4	2023
Crypto - KGV-11M Development Contract Award	2	2018	2	2018
Crypto - ACC Fielding Decision (FD)	4	2018	4	2018
Crypto - KGV-11M PDR	1	2019	1	2019
Crypto - KGV-11M CDR	3	2019	3	2019
Crypto - KGV-11M DT&E	1	2020	1	2020
Crypto - KGV-11M NSA Certification	3	2020	3	2020
Crypto - VACM Deliveries	2	2018	4	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Crypto - KGV-11M Deliveries	4	2020	4	2023
Crypto - ACC Deliveries	4	2019	4	2023
Key Management - KMI CI-2 Spiral 2 Spin 2 Development, Integration, and Test	1	2017	2	2017
Key Management - KMI CI-2 Spiral 2 Spin 3 Development, Integration, and Test	1	2017	3	2017
Key Management - KMI Tech Refresh Development, Integration, and Test	1	2017	4	2017
Key Management - KMI CI-3 Spiral 3 Spin 1 Development, Integration, and Test	1	2018	2	2021
Key Management - KMI CI-3 Spiral 3 Spin 2 Development, Integration, and Test	1	2020	4	2023
Key Management - Intermediary Application (iApp) Development and Product Testing	1	2017	4	2023
Key Management - KMI CI-2 Spiral 2 Spin 2 Fielding Decision (FD)	4	2017	4	2017
Key Management - KMI CI-2 Spiral 2 Full Deployment Decision (FDD)	2	2018	2	2018
Key Management - KMI CI-3 Spiral 3 Spin 1 FRP Decision / FD	3	2021	3	2021
Key Management - Simple Key Loader (SKL) Deliveries	1	2017	4	2023
Key Management - KMI CI-2 Spiral 2 Deliveries	1	2017	1	2018
Key Management - KMI Tech Refresh Deliveries	4	2018	4	2023
Public Key Infrastructure - System Engineering and Development of PKI	1	2017	4	2023
SHARKCAGE - RDC Initiation	2	2017	2	2017
SHARKCAGE - RDC Dev, Integ, & Test	3	2017	2	2019
SHARKCAGE - RDC Deliveries	2	2018	2	2019
SHARKCAGE - RDC Completion	2	2019	2	2019
SHARKCAGE - SHARKCAGE Transition Limited Deployment Decision	3	2019	3	2019
SHARKCAGE - SHARKCAGE Transition Dev, Integ, & Test	3	2019	4	2023
SHARKCAGE - SHARKCAGE Transition Deliveries	4	2019	4	2023
Navy Cyber Situational Awareness (NCSA) - RDC Initiation	2	2017	2	2017
NCSA - RDC Dev, Integ, & Test	3	2017	2	2019
NCSA - RDC Deliveries	2	2018	2	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 0734 / *Communications Security R&D*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
NCSA - RDC Completion	2	2019	2	2019
NCSA - NCSA Transition Limited Deployment Decision	3	2019	3	2019
NCSA - NCSA Transition Dev, Integ, & Test	3	2019	4	2023
NCSA - NCSA Transition Deliveries	4	2019	4	2023
Cybersecurity Services - Systems Engineering & Development of Cybersecurity Services	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303140N / *Information Sys Security Program*	Project (Number/Name) 3230 / *Information Assurance*	

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
3230: *Information Assurance*	16.496	1.523	2.415	2.274	-	2.274	2.133	2.179	2.219	2.268	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The goal of the Information Assurance (IA) program is to ensure the continued protection of Navy and joint information and information systems from hostile exploitation and attack. The Information Systems Security Program (ISSP) activities address the triad of Defense Information Operations: protection, detection, and reaction. Evolving attack sensing (detection), warning, and response (reaction) responsibilities extend far beyond the traditional ISSP role in protection of Information Systems Security (INFOSEC). Focused on the highly mobile forward deployed subscriber, the Navy's adoption of Network-Centric Warfare (NCW) places demands upon the ISSP, as the number of users expands significantly and the criticality of their use escalates. Today, the ISSP protects an expanding core of services critical to the effective performance of the Navy's mission.

The rapid rate of change in the underlying commercial and government information infrastructures makes the provision of security an increasingly complex and dynamic problem. IA technology mix and deployment strategies must evolve quickly to meet rapidly evolving threats and vulnerabilities. No longer can information security be divorced from the information infrastructure. The ISSP enables the Navy's war fighter to trust in the availability, integrity, authentication, privacy, and non-repudiation of information.

This project includes funds for advanced technology development, test and evaluation of naval information systems security based on leading edge technologies that will improve information assurance (e.g., situational awareness and information infrastructure protection) across all command echelons to tactical units afloat and war fighters ashore. This effort will provide the research to develop a secure seamless interoperable, common operational environment of networked information systems in the battle space and for monitoring and protecting the information infrastructure from malicious activities. This effort will provide naval forces a secure capability and basis in its achievement of protection from unauthorized access and misuse, and optimized IA resource allocations in the information battle space. This program will also develop core technology to: (1) improve network infrastructure resistance and resiliency to attacks; (2) enable the rapid development and certification of security-aware applications and information technologies in accordance with the common criteria for IA and IA-enabled information technology products by the National Security Telecommunications and Information Systems Security Committee; and (3) measure the effectiveness and efficiency of IA defensive capabilities under naval environments.

The program will develop common architectural frameworks that facilitate integration of network security capabilities, enable effective seamless interoperation, and contribute to a common consistent picture of the networked environment with respect to information assurance and security. This effort will address the need for a common operational picture for IA, as well as assessment of security technology critical to the success of the mission. This effort will also initiate requirements definition for situational awareness capabilities to support computer network defense in a highly-distributed, homogeneous, and heterogeneous networks including mobile and embedded networked devices. This effort also includes the architectural definition of situational awareness and visualization capabilities to support active computer network defense and support underlying data mining and correlation tools. This includes addressing the capability to remotely manage and securely control the configurations of network security components to implement changes in real time or near real time. This program will also initiate requirements definition for secure

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 3230 / *Information Assurance*

coalition data exchange and interoperation among security levels and classifications, and ensure approaches address various security level technologies as well as emerging architectural methods of providing interoperability across different security levels. IA will examine multi-level aware applications and technologies including databases, web browsers, routers/switches, etc. Efforts will also initiate infrastructure protection efforts as the Navy develops network centric architectures and warfare concepts, ensuring an evolutionary development of security architectures and products for IA that addresses Navy infrastructure requirements. IA will ensure the architectures evolve to provide proper protection as technology, Department of Defense (DoD) missions, and threats continuously evolve. IA includes defensive protections as well as intrusion monitoring (sensors), warning mechanisms, and response capabilities in the architecture. Ensure the unique security and performance requirements of tactical systems, including those operating various security levels are addressed. Also, the program will initiate the efforts to conceptualize new network centric warfare technology to protect our assets, such as secure network gateways, routers, components and tools that improve the survivability of Navy networks. Additionally, IA will provide systems security engineering, certification and accreditation support for high-confidence naval information systems and ensure certification and accreditation approaches are consistent with Navy and DoD 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: Information Assurance (IA)	1.523	2.415	2.274	0.000	2.274
Articles:	-	-	-	-	-
FY 2018 Plans: Continue systems security engineering, certification and accreditation support for high-confidence naval information systems and ensure certification and accreditation approaches are consistent with Navy and DoD requirements. Continue the development of a new techniques/technology for discovering adversarial presence in Navy/DoD networks, especially for APT within the network infrastructure and components/workstations. Efforts will focus on detection, isolation and remediation while maintaining continuity of operations and access to critical data. Complete the development of technology to provide prediction/early warning sensing of impending attacks based on network traffic and user behavior. Provide initial response options/actions based on sensing predictions and train sensors to address predicted threat to reduce the threat to engage cycle. Complete the development of critical cryptographic technology to support Navy unique platforms and requirements such as UASs (e.g., UAVs, UUV) ensuring the technology addresses the limited size, weight and power issues, and multiple data classification processing requirements, while as providing on-the-fly programmability of mission data and key material to support various missions such as COMSEC, ELINT, SIGINT, etc. Adapt the solution for other candidate platforms based on successful technology demonstration. Complete the development of new host-based security technology focused on addressing data-at-rest requirements, protection of the operating system and applications from nation state-sponsored activities, and methods for system and software updates that do not invalidate the security framework of the host workstation. Initiate the development of new technology to support asset criticality and management to improve effectiveness of cyber defenses in support of mission execution, focusing on threats and attack propagation through the network. Initiate the development of a new generation of cross-domain technology that focuses on critical infrastructure protection while protecting against					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 3230 / *Information Assurance*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
sophisticated nation state attacks and exfiltration, while supporting new data models and formats for emerging Navy networks. ***FY 2019 Base Plans:*** Continue the development of a new techniques/technology for discovering adversarial presence in Navy/ DoD networks, especially for APT within the network infrastructure and components/ workstations. Efforts will focus on detection, isolation and remediation while maintaining continuity of operations and access to critical data. Continue systems security engineering, certification and accreditation support for high-confidence, high criticality naval information systems and ensure certification and accreditation approaches are consistent with Navy and DoD requirements. Continue the development of new technology to support asset criticality and management to improve effectiveness of cyber defenses in support of mission execution, focusing on threats and attack propagation through the network. Continue the development of a new generation of cross-domain technology that focuses on critical infrastructure protection while protecting against sophisticated nation state attacks and exfiltration, while supporting new data models and formats for emerging Navy networks. Initiate the development of intelligent security components and infrastructure capable of protecting the DON's critical cyber assets through intelligent, autonomous self-diagnostics, automated damage assessment, and self-healing capabilities. Initiate the development of a framework to systematically identify optimal and pertinent features of cyber behavior data in order to detect anomalies. Anomalies stemming from malicious cyber activity (e.g., intrusions, denial of service, malware) will be identified, as well as the development of metrics indicating the health and security posture of the cyber resources. Initiate the development of algorithms that automatically identify the feature space and select the optimal feature set from the given cyber data, the network traffic, and the interconnectivity of the cyber resources. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease from FY18/19 is due to various efficiency and inflation rate adjustments.					
Accomplishments/Planned Programs Subtotals	1.523	2.415	2.274	0.000	2.274

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 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 3230 / *Information Assurance*

D. Acquisition Strategy

N/A

E. Performance Metrics

Protection of Navy and Joint information from hostile exploitation and attack.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0303140N / *Information Sys Security Program*	Project (Number/Name) 3230 / *Information Assurance*	

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	NRL : Washington, DC	16.496	1.523	Nov 2016	2.415	Nov 2017	2.274	Nov 2018	-		2.274	Continuing	Continuing	Continuing
		Subtotal	16.496	1.523		2.415		2.274		-		2.274	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	16.496	1.523		2.415		2.274		-		2.274	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 3230 / *Information Assurance*

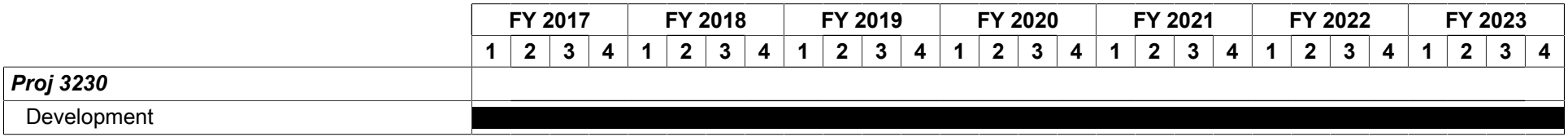


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0303140N / *Information Sys Security Program*	**Project (Number/Name)** 3230 / *Information Assurance*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3230				
Development	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305192N *I JT Military Intel Programs*							
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	6.019	6.352	6.081	-	6.081	6.142	6.276	6.410	6.541	Continuing	Continuing
2246: *Intelligence Support to the Common Operational Picture*	0.000	3.430	3.651	3.396	-	3.396	3.393	3.468	3.542	3.613	Continuing	Continuing
2295: *Maritime Support*	0.000	2.589	2.701	2.685	-	2.685	2.749	2.808	2.868	2.928	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL 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	6.019	6.352	6.491	-	6.491
Current President's Budget	6.019	6.352	6.081	-	6.081
Total Adjustments	0.000	0.000	-0.410	-	-0.410
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.410	-	-0.410

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 / 7	R-1 Program Element (Number/Name) PE 0305192N / *JT Military Intel Programs*	Project (Number/Name) 2246 / *Intelligence Support to the Common Operational Picture*	

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
2246: *Intelligence Support to the Common Operational Picture*	0.000	3.430	3.651	3.396	-	3.396	3.393	3.468	3.542	3.613	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL 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 / 7					R-1 Program Element (Number/Name) PE 0305192N / *JT Military Intel Programs*				Project (Number/Name) 2295 / *Maritime 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**
2295: *Maritime Support*	0.000	2.589	2.701	2.685	-	2.685	2.749	2.808	2.868	2.928	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified CONFIDENTIAL and are submitted annually to Congress in the classified budget justification books.

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305204N *I Tactical Unmanned Aer Vehicles*

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	253.416	8.436	7.770	8.529	-	8.529	9.471	9.512	9.685	9.467	Continuing	Continuing
2478: *Tactical Control System*	253.416	8.436	7.770	8.529	-	8.529	9.471	9.512	9.685	9.467	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element provides for development and capability requirements for Tactical Unmanned Aerial Vehicles. Project is a Joint Military Intelligence Program.

The Tactical Control System (TCS), a component of the MQ-8 System, provides for the joint tactical MQ-8 Fire Scout System. TCS, integrated into the MQ-8 Mission Control System, provides the warfighters with the capability for day/night aerial Intelligence, Surveillance and Reconnaissance, Target Acquisition, voice, data and command and control communications/relay, and mine detection and localization. Additionally, TCS provides a multi-level, scalable, and flexible operator control of the air vehicles and payloads, as well as direct receipt and dissemination of unmanned aerial vehicle sensor data.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	8.436	7.770	10.070	-	10.070
Current President's Budget	8.436	7.770	8.529	-	8.529
Total Adjustments	0.000	0.000	-1.541	-	-1.541
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-1.541	-	-1.541

Change Summary Explanation

The FY 2019 funding request was reduced by $1.400 million to account for the availability of prior year execution balances.

Schedule: TCS schedule and software improvements coincide with MQ-8 Fire Scout schedule milestones.

Technical: None

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305204N / *Tactical Unmanned Aer Vehicles*	Project (Number/Name) 2478 / *Tactical Control 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
2478: *Tactical Control System*	253.416	8.436	7.770	8.529	-	8.529	9.471	9.512	9.685	9.467	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The TCS program supports the MQ-8 Fire Scout System and is a standards-based system, which provides interoperability and commonality for Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) interfaces of Unmanned Aircraft Systems (UAS). TCS software, operating on Mission Control System (also referred to as a Ground Control Station) hardware, utilizes North Atlantic Treaty Organization (NATO) Standardization Agreements (STANAG)-4586 architecture to communicate across a Tactical Common Data Link.

TCS provides a full range of scalable UAS capabilities from passive receipt of air vehicle and payload data to full air vehicle and payload command and control. TCS offers the warfighter a common core operating environment to simultaneously receive, process, and disseminate data from different UAS types for intelligence, reconnaissance, surveillance, and combat assessment.

This program supports enhancements and updates to TCS in order to continue to meet supported air vehicle enhancements, incorporation of new technologies that will be used to enhance overall system performance, incorporate new payloads and payload capabilities (such as advanced sensors and weapons), incorporate multi-vehicle control, incorporate NATO STANAG-4586 and Command, Control, Communications, Computers and Intelligence enhancements, and alignment with OSD direction for UAS control segments. The FY19 funding increase supports final development of the MCS integration with the MQ-8C radar program.

TCS software is incorporated into the MQ-8 Fire Scout System and fields in conjunction with MQ-8. TCS software addresses MQ-8 requirements validated by the Joint Requirements Oversight Council in the MQ-8 Capability Production Document (Nov 2016) and multiple Joint Emergent Operational Need/Urgent Operational Needs statements. TCS is supported by an Operational Requirements Document (Feb 2000).

TCS maximizes the use of contractor and government off-the-shelf hardware and software whenever possible and incorporates software/hardware enhancements where appropriate to maintain growth potential and minimize hardware and operating system dependence. TCS software is interoperable and is compliant with the OSD Command and Control, Communications, Intelligence Joint Technical Architecture, Distributed Common Ground System standards, Global Command and Control System, and NATO standards. TCS hardware and software upgrades support the Navy's Common Control System migration.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: TCS Development and Integration	7.752	7.038	7.742	0.000	7.742
Articles:	-	-	-	-	-
FY 2018 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305204N / *Tactical Unmanned Aer Vehicles*	**Project (Number/Name)** 2478 / *Tactical Control 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 TCS integration and test with MQ-8 development. Continue new TCS capabilities to support requirements for LCS efforts. Continue TCS STANAG 4586 compliance. Continue TCS C4ISR interface integration and testing for MQ-8 systems. Continue hardware and operating system independence initiatives. Continue Radar and payload integration and test, MQ-8C integration, and continue preparations for Common Control System (CCS) integration and demonstrations. Continue TCS Version 8 Common GCS transition. ***FY 2019 Base Plans:*** Continue TCS integration and test with MQ-8 development. Continue new TCS capabilities to support requirements for LCS efforts. Continue TCS STANAG 4586 compliance. Continue TCS C4ISR interface integration and testing for MQ-8 systems. Continue hardware and operating system independence initiatives. Continue Radar and payload integration and test, MQ-8C integration, and continue preparations for CCS integration and demonstrations. Continue TCS Version 8 Common GCS transition and initiate TCS Version 9 CCS preparations. ***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: Technical and Engineering Services	0.684	0.732	0.787	0.000	0.787
Articles:	-	-	-	-	-
FY 2018 Plans: Continue government engineering support, contractor support, program support, and travel for the TCS program. ***FY 2019 Base Plans:*** Continue government engineering support, contractor support, program support, and travel for the TCS program. ***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	8.436	7.770	8.529	0.000	8.529

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305204N / *Tactical Unmanned Aer Vehicles*	**Project (Number/Name)** 2478 / *Tactical Control System*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The TCS program is government owned, non-proprietary software that currently supports the MQ-8 Fire Scout System. The TCS program continues to focus on Navy requirements and standards-based architecture/software to support interoperability. The government-owned TCS software development toolkit is available to all UAS developers and manufacturers that allows a low-cost integration into the open architecture non-proprietary TCS system. TCS provides software modules to the Navy CCS and the TCS tech refresh hardware supports migration to CCS software.

E. Performance Metrics

Successfully complete Navy payloads integration, to include Coastal Battlefield Reconnaissance and Analysis (COBRA). Support MQ-8C Endurance Upgrade, Radar, and future capabilities. Successfully complete Littoral Combat Ship Integration. Complete Developmental and Operational Test.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305204N / *Tactical Unmanned Aer Vehicles*	Project (Number/Name) 2478 / *Tactical Control 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
Primary Software Development 2	SS/CPIF	Raytheon : Falls Church,VA	37.533	7.739	Dec 2016	7.032	Dec 2017	7.742	Dec 2018	-		7.742	57.947	117.993	117.993
Prior Year Cost no longer Funded in the FYDP	C/CPAF	Raytheon : Falls Church,VA	195.332	0.000		0.000		0.000		-		0.000	0.000	195.332	195.332
Primary Software Development 2	SS/CPIF	NGC : San Diego, CA	0.173	0.000		0.000		0.000		-		0.000	0.000	0.173	0.173
		Subtotal	233.038	7.739		7.032		7.742		-		7.742	57.947	313.498	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	Various : Various	1.321	0.025	Nov 2016	0.026	Nov 2017	0.027	Nov 2018	-		0.027	Continuing	Continuing	Continuing
		Subtotal	1.321	0.025		0.026		0.027		-		0.027	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	3.736	0.247	Nov 2016	0.260	Nov 2017	0.268	Nov 2018	-		0.268	Continuing	Continuing	Continuing
Government Engineering Support	WR	Various : Various	10.161	0.246	Nov 2016	0.264	Nov 2017	0.268	Nov 2018	-		0.268	Continuing	Continuing	Continuing
Program Management Support	Various	Various : Various	4.791	0.156	Nov 2016	0.164	Nov 2017	0.199	Nov 2018	-		0.199	Continuing	Continuing	Continuing
Travel	WR	NAVAIR : Patuxent River, MD	0.369	0.023	Nov 2016	0.024	Nov 2017	0.025	Nov 2018	-		0.025	Continuing	Continuing	Continuing
		Subtotal	19.057	0.672		0.712		0.760		-		0.760	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305204N / *Tactical Unmanned Aer Vehicles*	Project (Number/Name) 2478 / *Tactical Control System*	

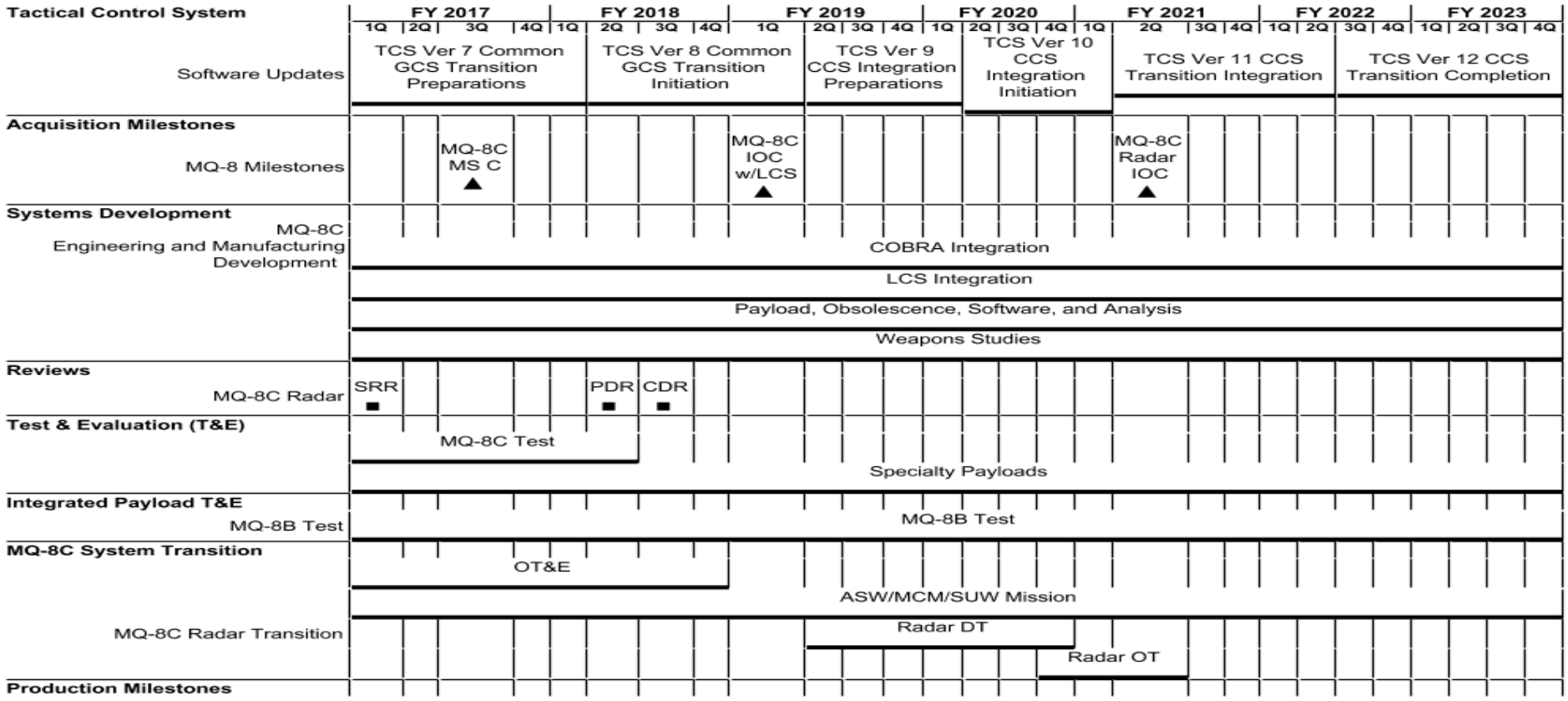
Management Services ($ in Millions)

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
Remarks															
Travel Contract Type is TO.															

	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	253.416	8.436		7.770		8.529		-		8.529	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305204N / *Tactical Unmanned Aer Vehicles*	**Project (Number/Name)** 2478 / *Tactical Control System*



2019PB - 0305204N - 2478

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305204N / *Tactical Unmanned Aer Vehicles*	**Project (Number/Name)** 2478 / *Tactical Control System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Tactical Control System				
Software Updates: TCS Ver 7 Common GCS Transition Preparations	1	2017	1	2018
Software Updates: TCS Ver 8 Common GCS Transition Initiation	2	2018	1	2019
Software Updates: TCS Ver 9 CCS Integration Preparations	2	2019	1	2020
Software Updates: TCS Ver 10 CCS Integration Initiation	2	2020	1	2021
Software Updates: TCS Ver 11 CCS Transition Integration	2	2021	2	2022
Software Updates: TCS Ver 12 CCS Transition Completion	3	2022	4	2023
Acquisition Milestones: MQ-8 Milestones: MQ-8 Initial Operational Capability (IOC) MQ-8C Littoral Combat Ship (LCS)	1	2019	1	2019
Acquisition Milestones: MQ-8 Milestones: MQ-8C Milestone C	3	2017	3	2017
Acquisition Milestones: MQ-8 Milestones: MQ-8C Radar IOC	2	2021	2	2021
Systems Development: Engineering and Manufacturing Development: Coastal Battlefield Reconnaissance and Analysis Integration (COBRA), BLK 1/2/3	1	2017	4	2023
Systems Development: Engineering and Manufacturing Development: Littoral Combat Ship (LCS) Integration	1	2017	4	2023
Systems Development: Engineering and Manufacturing Development: Payload, Obsolescence, Software, and Analysis	1	2017	4	2023
Systems Development: Engineering and Manufacturing Development: Weapons Studies	1	2017	4	2023
Reviews: MQ-8C Radar: System Requirements Review (SRR)	1	2017	1	2017
Reviews: MQ-8C Radar: Preliminary Design Review (PDR)	2	2018	2	2018
Reviews: MQ-8C Radar: Critical Design Review (CDR)	3	2018	3	2018
Test & Evaluation (T&E): MQ-8C Development Test	1	2017	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305204N / *Tactical Unmanned Aer Vehicles*	**Project (Number/Name)** 2478 / *Tactical Control System*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Test & Evaluation (T&E): Specialty Payloads	1	2017	4	2023
Integrated Payload T&E: MQ-8B Test: MQ-8B/C Test: Littoral Combat Ship (LCS) Integration	1	2017	4	2023
MQ-8C System Transition: Operational Test and Evaluation (OT&E)	1	2017	4	2018
MQ-8C System Transition: ASW/MCM/SUW Mission	1	2017	4	2023
MQ-8C System Transition: MQ-8C Radar Transition: Radar Developmental Test (DT)	2	2019	4	2020
MQ-8C System Transition: MQ-8C Radar Transition: Radar Operational Test (OT)	4	2020	2	2021

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305205N *I (U)UAS Integration and Interoperability*							
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	42.202	21.543	39.736	41.212	-	41.212	40.446	36.203	43.309	35.110	Continuing	Continuing
3379: *Common Control System*	42.202	21.543	39.736	41.212	-	41.212	40.446	36.203	43.309	35.110	Continuing	Continuing

Note

The Common Control System (CCS) was budgeted in PE 0604404N prior to FY16.

A. Mission Description and Budget Item Justification

Common Control System (CCS) budget profile changes are due to program realignment and acceleration to support CCS development and integration in support of MQ-25 Stingray, MQ-8 Fire Scout and follow on UxS platforms.

This PU funds the Unmanned Systems (UxSs) CCS. The primary mission of CCS is to provide common control across the Navy's UxSs portfolio to add scalable and adaptable warfighting capability, implement robust cybersecurity attributes, leverage existing government owned products, eliminate redundant software development efforts, consolidate product support, encourage innovation, improve cost control and enable rapid integration of UxS capabilities across Aviation, Surface, Sub-Surface, and Ground domains.

CCS will be a ship/shore/airborne/expeditionary based common control system that provides Vehicle Management (VM) and Mission Management/Mission Planning (MM/MP) capabilities for Naval Group 1 through 5 Unmanned Air Vehicles (UAVs) as well as other domain UxSs. VM is the software that allows the operator to control the UxS. MM/MP is the software that allows the operator to create mission plans and control the UxS's sensors. CCS software is based on the OSD Unmanned Control Segment (UCS) architecture which is a service oriented open architecture that is modular and scalable to meet evolving Service requirements and is also supportive of safety/airworthiness certification and cybersecurity certification and accreditation.

This program will define, develop, and deliver CCS capability that enables the flexibility for Ground Control Systems (GCS) that could be ship, shore, airborne, or expeditionary based to operate multiple and dissimilar Naval UxSs. CCS includes a common framework, user interface, and common components that will also be integrated and tested with legacy platform components. CCS is being developed with an open and modular business model with robust cybersecurity implementation and will be provided as Government Furnished Equipment (GFE) to UxS contractors as required.

The CCS acquisition approach provides increasing capability through incremental development for UxS platforms as follows:

Increment I delivers initial unmanned vehicle management (VM) functionality for MQ-25 Stingray in FY18, which includes flight maneuvering and stationing, situational awareness, and health & performance status monitoring, hosted on legacy platform hardware. CCS VM functionality will also be delivered to MQ-8 Fire Scout in FY19 with requirements development initiated in FY17. Additional efforts include developing plans for integration of common CCS VM services already developed under this program into other UxS cross-domain platforms' control stations to reduce department-level Total Ownership Costs for unmanned Ground Control Systems.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305205N *I (U)UAS Integration and Interoperability*

Increment II builds upon CCS Increment I software delivery, adding discrete common MM/MP capabilities as well as maturing VM capabilities. These MM/MP capabilities include route planning, aerial refueling, sensor and payload control, and data processing and dissemination. CCS Increment II software will be hosted on legacy platform hardware. Additionally, Increment II adds robust cybersecurity controls, key systems safety attributes and core program infrastructure, to include a system integration lab and software support activity (SSA).

Increment III develops common hardware for hosting CCS. CCS Increment III software will be developed and delivered with additional capabilities to include cross-domain capabilities and control of multiple dissimilar UxS for further enterprise-level Total Ownership Cost savings.

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. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	36.509	39.736	17.547	-	17.547
Current President's Budget	21.543	39.736	41.212	-	41.212
Total Adjustments	-14.966	0.000	23.665	-	23.665
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.367	0.000			
• Program Adjustments	0.000	0.000	24.158	-	24.158
• Rate/Misc Adjustments	0.001	0.000	-0.493	-	-0.493
• Congressional Directed Reductions Adjustments	-14.600	-	-	-	-

Change Summary Explanation

Note 1: FY17 planned Increment II software requirements and development effort deferred one year
Note 2: FY17 planned CCS Increment I integration into MQ-8 Fire Scout contract delayed six months
Note 3: Schedule updated to show a more detailed breakout of activities of each Increment, including incremental delivery of additional capabilities in periodic software releases.
Note 4: Schedule updated to show Increment I completion in FY19.
Note 5: Moving Target Indicator (MTI) Speed-to-Fleet effort removed due to direction to allocate all Speed-to-Fleet funds to Geo-intelligence Unified Naval Streaming Systems (GUNNS) in FY17.
Note 6: Additional funding ($24.2M) provided in FY19 for CCS program wholeness and MQ-25 acceleration.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / *(U)UAS Integration and Interoperability*	Project (Number/Name) 3379 / *Common Control 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
3379: *Common Control System*	42.202	21.543	39.736	41.212	-	41.212	40.446	36.203	43.309	35.110	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

The Common Control System (CCS) was budgeted in PE 0604404N prior to FY16.

A. Mission Description and Budget Item Justification

Common Control System (CCS) budget profile changes are due to program realignment and acceleration to support CCS development and integration in support of MQ-25 Stingray, MQ-8 Fire Scout and follow on UxS platforms.

This PE funds the Unmanned Systems (UxSs) CCS. The primary mission of CCS is to provide common control across the Navy's UxSs portfolio to add scalable and adaptable warfighting capability, implement robust cybersecurity attributes, leverage existing government owned products, eliminate redundant software development efforts, consolidate product support, encourage innovation, improve cost control and enable rapid integration of UxS capabilities across Aviation, Surface, Sub-Surface, and Ground domains.

CCS will be a ship/shore/airborne/expeditionary based common control system that provides Vehicle Management (VM) and Mission Management/Mission Planning (MM/MP) capabilities for Naval Group 1 through 5 Unmanned Air Vehicles (UAVs) as well as other domain UxSs. VM is the software that allows the operator to control the UxS. MM/MP is the software that allows the operator to create mission plans and control the UxS's sensors. CCS software is based on the OSD Unmanned Control Segment (UCS) architecture which is a service oriented open architecture that is modular and scalable to meet evolving Service requirements and is also supportive of safety/airworthiness certification and cybersecurity certification and accreditation.

This program will define, develop, and deliver CCS capability that enables the flexibility for Ground Control Systems (GCS) that could be ship, shore, airborne, or expeditionary based to operate multiple and dissimilar Naval UxSs. CCS includes a common framework, user interface, and common components that will also be integrated and tested with legacy platform components. CCS is being developed with an open and modular business model with robust cybersecurity implementation and will be provided as Government Furnished Equipment (GFE) to UxS contractors as required.

The CCS acquisition approach provides increasing capability through incremental development for UxS platforms as follows:

Increment I delivers initial unmanned vehicle management (VM) functionality for MQ-25 Stingray in FY18, which includes flight maneuvering and stationing, situational awareness, and health & performance status monitoring, hosted on legacy platform hardware. CCS VM functionality will also be delivered to MQ-8 Fire Scout in FY19 with requirements development initiated in FY17. Additional efforts include developing plans for integration of common CCS VM services already developed under this program into other UxS cross-domain platforms' control stations to reduce department-level Total Ownership Costs for unmanned Ground Control Systems.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305205N / *(U)UAS Integration and Interoperability*	**Project (Number/Name)** 3379 / *Common Control System*

Increment II builds upon CCS Increment I software delivery, adding discrete common MM/MP capabilities as well as maturing VM capabilities. These MM/MP capabilities include route planning, aerial refueling, sensor and payload control, and data processing and dissemination. CCS Increment II software will be hosted on legacy platform hardware. Additionally, Increment II adds robust cybersecurity controls, key systems safety attributes and core program infrastructure, to include a system integration lab and software support activity (SSA).

Increment III develops common hardware for hosting CCS. CCS Increment III software will be developed and delivered with additional capabilities to include cross-domain capabilities and control of multiple dissimilar UxS for further enterprise-level Total Ownership Cost savings.

The CCS PU funds the Full Motion Video (FMV) for Geo-intelligence Unified Naval Streaming System (GUNSS) Speed-to-the-Fleet capability initiative in FY17.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Increment I	14.400	16.946	3.125	0.000	3.125
Articles:	-	-	-	-	-
Description: Common Control System (CCS) Increment 1 provides Unmanned System (UxS) Vehicle Management (VM) hosted on legacy platform hardware required to support UxSs control system development, integration and test. Initial platforms include MQ-25 Stingray and MQ-8 Fire Scout. ***FY 2018 Plans:*** Development of CCS VM capability will continue in FY18 and includes support for accelerated MQ-25 Stingray capability delivery and CCS VM build delivery to MQ-8 Fire Scout. Increment I Vehicle Management capabilities and common requirements definition, analysis, and development continues in FY18 for other UxS target platforms. ***FY 2019 Base Plans:*** Development of CCS VM capability under Increment I will be completed. Correction of deficiencies, software delivery, and platform integration and test support will continue in FY19. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $13.821M from FY 2018 to FY 2019 due to minimal tasking required in FY 2019 to complete the Increment I efforts.					
Title: Increment II	7.143	22.790	38.087	0.000	38.087
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305205N / *(U)UAS Integration and Interoperability*	**Project (Number/Name)** 3379 / *Common Control System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: CCS Increment II develops common MM/MP capabilities and updates and matures VM capabilities, integrating these capabilities into the core CCS software baseline delivered under Increment I in support of Naval UxSs. CCS Increment II will be the future common control system software supporting MQ-25. Plans include ensuring that maximum commonality is maintained for transition to MQ-8 Fire Scout, MQ-4 Triton, and other UxS to reduce enterprise Total Ownership Cost for UxS Ground Control Systems. Increment II incorporates cyber security measures, key systems safety attributes, and core program infrastructure to include system integration lab and software support activities. ***FY 2018 Plans:*** CCS Increment II will begin initial software development incorporating results of requirements and architecture development efforts. Increment II plans to develop and integrate cybersecurity software modules into the CCS software baseline. Increment II (Mission Planning and Mission Management) common requirements definition, analysis, and development will continue in FY18. Target platforms include: MQ-25 Stingray, MQ-8 Fire Scout and MQ-4 Triton but may be expanded to other UxS domains. Additionally, Increment II planning will include establishment of the Software Support Activity (SSA) for CCS. ***FY 2019 Base Plans:*** CCS Increment II continues software common service development, supported by the continued refinement of incremental common service releases for MQ-25 Stingray and MQ-8 Fire Scout which will also be able to support other future UxS platforms transitioning to CCS. SSA efforts will continue, including support infrastructure for systems engineering, development, integration, test, correction of deficiencies, quality assurance, and cyber security compliance. Integration and test support for CCS platforms will continue. Advanced development and risk reduction efforts support future UxS integration and establishment of formal CCS software test capabilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $15.297M from FY 2018 to FY 2019 due to increased tasking required in FY 2019 associated with Increment II development and integration efforts.					
Accomplishments/Planned Programs Subtotals	21.543	39.736	41.212	0.000	41.212

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305205N / *(U)UAS Integration and Interoperability*	**Project (Number/Name)** 3379 / *Common Control System*

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/0605414N: *Unmanned Carrier Aviation (UCA)*	75.863	222.208	712.338	-	712.338	705.972	690.368	680.097	550.469	Continuing	Continuing
• OPN/4250: *Common Control System*	0.000	0.000	0.594	-	0.594	0.792	1.188	1.484	11.788	Continuing	Continuing

Remarks

D. Acquisition Strategy

Program Executive Office Unmanned Aviation and Weapon Systems (PEO(U&W)) issued an Acquisition Decision Memorandum (ADM) 5000 Ser PEO(U&W)/11-093 dated July 1, 2011 to establish the Common Control System (CCS) to achieve Unmanned Aircraft System (UAS) common control across PEO(U&W) UAS platforms to eliminate redundant efforts, encourage innovation and improve cost control of unmanned aviation. As directed by the ADM the program will define, develop and deliver a common control system to operate respective naval Unmanned Systems (UxS)s. This will include a common framework, a common user interface and common components that will be integrated and tested with unique components on emerging or legacy platforms. The CCS acquisition approach provides increasing UxS capability through incremental development for UxS platforms as follows: Increment I provides common Vehicle Management (VM) capability to MQ-25 Stingray and MQ-8 Fire Scout which can also support other UxSs. Increment II develops common MM/MP capabilities and updates and matures VM capabilities, integrating these capabilities into the core CCS software baseline delivered under Increment I in support of Naval UxSs. Increment III develops common hardware for hosting CCS. CCS Increment III software will be developed and delivered with additional capabilities to include cross-domain capabilities and control of multiple dissimilar UxS for further enterprise-level Total Ownership Cost savings. CCS will be provided to the MQ-25 Stingray air vehicle prime as Government-Furnished Equipment (GFE) and also for transition to MQ-8 Fire Scout, MQ-4 Triton and follow-on UxS platforms to reduce enterprise Total Ownership Cost for Ground Control Systems. CCS will leverage existing government-owned products and employ competitive procurement vehicles. ASN (RDA) designated CCS Increment II as an ACAT II program on December 1, 2017.

E. Performance Metrics

CCS uses a Service-Oriented Architecture based on the OSD Unmanned Control Segment (UCS) architecture. CCS provided analyses and documentation to support the development of Key Performance Parameters (KPP's). CCS inherits the common requirements of each supported UxS platform's CDD through the respective specification trees. CCS must therefore also support the Key Performance Parameters, Key System Attributes, Measures of Suitability/Effectiveness, Concepts of Operations, etc., and concepts of operations flowed down from each supported platform.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305205N / *(U)UAS Integration and Interoperability*	Project (Number/Name) 3379 / *Common Control 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
Primary Software Development (Increment I)	C/CPFF	Raytheon : Dulles, VA	17.036	14.910	Dec 2016	12.982	Dec 2017	0.000		-		0.000	0.000	44.928	44.928
Primary Software Development - Software Services (Increment II)	C/CPFF	TBD : TBD	0.000	0.000		4.311	May 2018	16.988	Feb 2019	-		16.988	Continuing	Continuing	Continuing
Advanced Development	WR	NAWC-WD : China Lake, CA	2.875	1.100	Nov 2016	1.000	Nov 2017	1.205	Nov 2018	-		1.205	Continuing	Continuing	Continuing
Software Cyber Modeling	C/CPFF	JHU APL : Baltimore, MD	2.000	0.000		0.000		0.000		-		0.000	0.000	2.000	2.000
Architecture Development	C/CPFF	SEI : Hanscom, MA	1.205	0.000		0.000		0.000		-		0.000	0.000	1.205	1.205
Architecture Development	C/CPFF	NRL : Washington, DC	2.330	0.000		0.000		0.000		-		0.000	0.000	2.330	2.330
Architecture Development	Various	Various : Various	2.461	1.144	Apr 2017	3.300	Feb 2018	1.000	Nov 2018	-		1.000	Continuing	Continuing	Continuing
SSA - Software Integration	C/CPFF	TBD : TBD	0.000	0.000		3.000	Feb 2018	5.000	Nov 2018	-		5.000	Continuing	Continuing	Continuing
		Subtotal	27.907	17.154		24.593		24.193		-		24.193	Continuing	Continuing	N/A

Remarks

The FY18 Primary Software Development - Software Services contract supports the development of software services that will be incorporated into CCS. Separate competitive contracts for these software services will be awarded and incrementally funded starting in FY18 so the performing activity and location are currently TBD due to the competitive contracting strategy. In FY19 this activity increases due to multiple parallel, incrementally funded design, development, and integration efforts which include CCS Increment II v2.0 (originally started in FY18 and which continues throughout FY19), and the concurrent start in FY19 of CCS Increment II v2.1 analysis, design, and development efforts.

The FY18 SSA-Software Integration contract supports the establishment of a CCS software support activity (SSA). FY19 continues incremental funding for the SSA software integration contract efforts awarded via a competitive 3rd Qtr. FY18 contract award. Performing activity and location are currently TBD due to the competitive contracting strategy.

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	NAWC-AD : Pax River, MD	4.900	2.559	Nov 2016	7.228	Nov 2017	8.104	Nov 2018	-		8.104	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305205N / *(U)UAS Integration and Interoperability*	**Project (Number/Name)** 3379 / *Common Control 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
Lead Systems Engineering and Integration	WR	NAWC-WD : Pt Mugu, CA	2.545	0.450	Nov 2016	0.000		0.000		-		0.000	0.000	2.995	-
Systems Engineering	C/CPFF	Engility : Pax River, MD	0.756	0.000		0.000		0.000		-		0.000	0.000	0.756	0.756
Systems Engineering Integration Test	C/CPFF	Booz Allen : Pax River, MD	2.714	0.000		0.000		0.000		-		0.000	0.000	2.714	2.714
Systems Engineering Study	C/CPFF	CNA : Alexandria, VA	0.800	0.000		0.000		0.000		-		0.000	0.000	0.800	0.800
Systems Engineering	Various	Various : Various	1.100	0.566	Dec 2016	0.000		0.000		-		0.000	0.000	1.666	1.666
Systems Engineering Technical Agent	C/CPFF	DCS Corporation : Alexandria, VA	0.000	0.535	Aug 2017	4.000	Feb 2018	4.000	Nov 2018	-		4.000	Continuing	Continuing	Continuing
		Subtotal	12.815	4.110		11.228		12.104		-		12.104	Continuing	Continuing	N/A

Remarks

Increase in FY19 due to additional support for Increment II software service efforts.

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/OT	WR	NAWC-AD : Pax River, MD	0.100	0.209	Nov 2016	3.315	Nov 2017	4.315	Nov 2018	-		4.315	Continuing	Continuing	Continuing
DT&E	WR	NAWC-WD : Pt Mugu, CA	0.730	0.000		0.000		0.000		-		0.000	0.000	0.730	-
		Subtotal	0.830	0.209		3.315		4.315		-		4.315	Continuing	Continuing	N/A

Remarks

Test and Evaluation efforts increase beginning in FY19 to support MQ-8 DT/OT events for the integration, test, and fielding of CCS Increment I software in MQ-8 control stations.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305205N / *(U)UAS Integration and Interoperability*	**Project (Number/Name)** 3379 / *Common Control 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
Program Management	WR	NAWC-AD : Pax River, MD	0.650	0.020	Nov 2016	0.000		0.000		-		0.000	0.000	0.670	-
Program Management Support	C/CPFF	Ausley Associates : Lexington Park, MD	0.000	0.050	May 2017	0.600	Nov 2017	0.600	Nov 2018	-		0.600	Continuing	Continuing	Continuing
		Subtotal	0.650	0.070		0.600		0.600		-		0.600	Continuing	Continuing	N/A

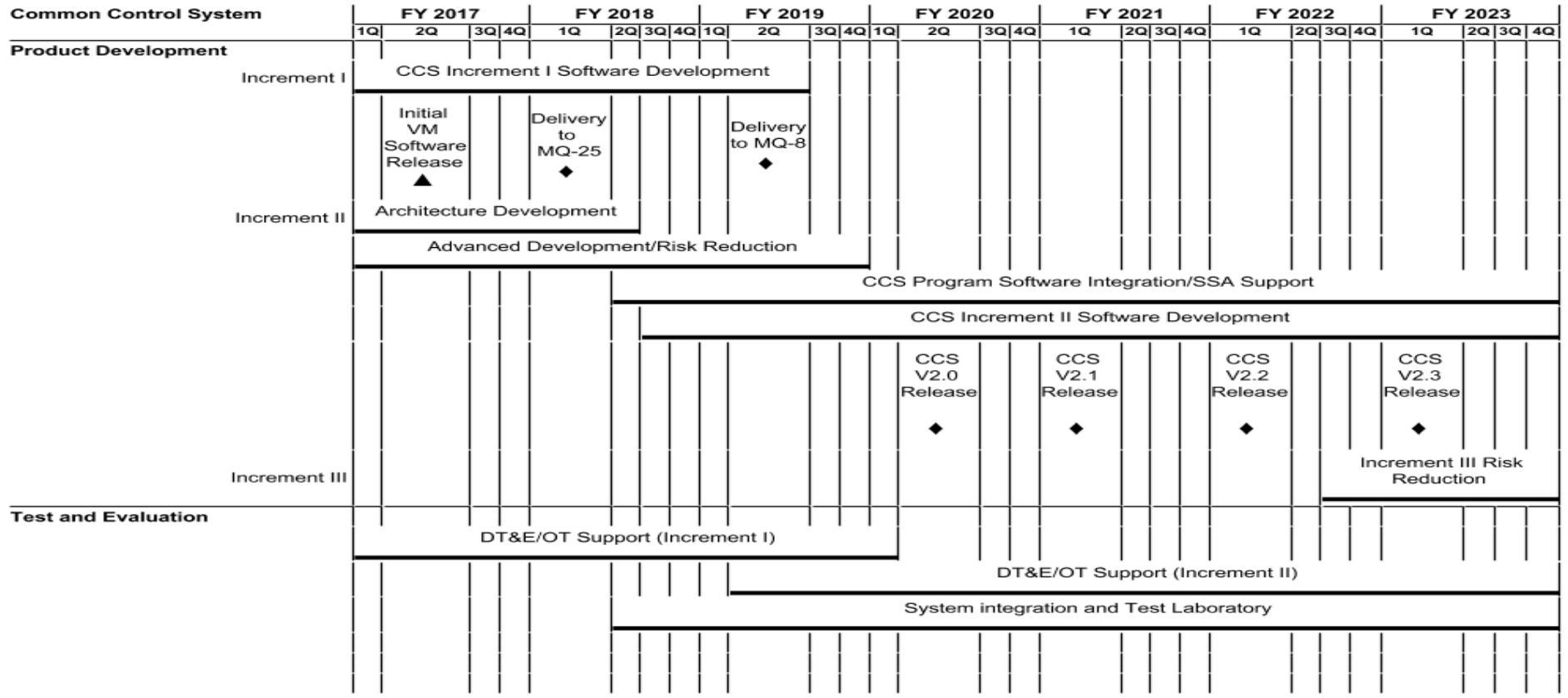
Remarks

Contractor support supporting multiple platforms in FY18 and FY19.

	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	42.202	21.543		39.736		41.212		-		41.212	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305205N / *(U)UAS Integration and Interoperability*	**Project (Number/Name)** 3379 / *Common Control System*



2019OSD - 0305205N - 3379

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305205N / *(U)UAS Integration and Interoperability*	**Project (Number/Name)** 3379 / *Common Control System*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Common Control System				
Product Development: Increment I: CCS Increment I Software Development	1	2017	2	2019
Product Development: Increment I: CCS Increment I Initial VM Software Release	2	2017	2	2017
Product Development: Increment I: Delivery to MQ-25	1	2018	1	2018
Product Development: Increment I: Delivery to MQ-8	2	2019	2	2019
Product Development: Increment II: Architecture Development	1	2017	2	2018
Product Development: Increment II: Advanced Development/Risk Reduction	1	2017	4	2019
Product Development: Increment II: CCS Program Software Integration/SSA Support	2	2018	4	2023
Product Development: Increment II: CCS Increment II Software Development	3	2018	4	2023
Product Development: Increment II: CCS V2.0 Release	2	2020	2	2020
Product Development: Increment II: CCS V2.1 Release	1	2021	1	2021
Product Development: Increment II: CCS V2.2 Release	1	2022	1	2022
Product Development: Increment II: CCS V2.3 Release	1	2023	1	2023
Product Development: Increment III: Increment III Risk Reduction	3	2022	4	2023
Test and Evaluation: DT&E/OT Support (Increment I)	1	2017	1	2020
Test and Evaluation: DT&E/OT Support (Increment II)	2	2019	4	2023
Test and Evaluation: System Integration and Test Laboratory	2	2018	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305208M *I (U)Distributed Common Ground/Surface 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	71.870	2.079	12.867	7.687	-	7.687	9.065	4.604	4.619	4.669	Continuing	Continuing
2268: *Distributed Common Ground System (DCGS-MC)*	71.870	2.079	12.867	7.687	-	7.687	9.065	4.604	4.619	4.669	Continuing	Continuing

A. Mission Description and Budget Item Justification

DCGS-MC, in compliance with the Department of Defense DCGS Family of Systems (FOS) concept, is a service-level effort to migrate select USMC Intelligence, Surveillance and Reconnaissance (ISR) processing and exploitation capabilities into a single, integrated, net-centric baseline that will be interoperable with other services and agencies.

Multiple functional capability sets will be configured to support Marine intelligence analysts across the Marine Air-Ground Task Force (MAGTF). The goal of DCGS-MC is to make external and internal ISR data more visible, accessible, and understandable.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	2.100	12.867	3.947	-	3.947
Current President's Budget	2.079	12.867	7.687	-	7.687
Total Adjustments	-0.021	0.000	3.740	-	3.740
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.011	0.000			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	3.836	-	3.836
• Rate/Misc Adjustments	0.000	0.000	-0.096	-	-0.096
• Congressional General Reductions Adjustments	-0.010	-	-	-	-

Change Summary Explanation

The decrease of $5.180M from FY18 to FY19 is due to the completion of the Operating System (Win10) upgrade and integration, testing, and certification of Joint Strike Fighter (JSF) requirements, National Geospatial Intelligence Agency's (NGA) iStore software; geospatial intelligence (GEOINT) capabilities; and Aeronautical Reconnaissance Coverage Geographic Information System (ArcGIS) Portal within the DCGS-MC Programs of Record. Additionally, funding supported the completion of initiation and test efforts for Tactical Exploitation Group (TEG) and Topographic Production Capability (TPC) assets in support of JSF

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305208M *I (U)Distributed Common Ground/Surface Systems*

squadrons in order to capture increased data sensing capability with newer aviation platforms. Funding also supported the completion of system requirement analysis and review for future software releases to include All Source Fusion (ASF) and Signals Intelligence (SIGINT).

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	Project (Number/Name) 2268 / *Distributed Common Ground System (DCGS-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
2268: *Distributed Common Ground System (DCGS-MC)*	71.870	2.079	12.867	7.687	-	7.687	9.065	4.604	4.619	4.669	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Distributed Common Ground/Surface System Marine Corps (DCGS-MC) is a Family of Systems (FoS) providing analysis and production within garrison and deployed Marine Corps organizations. DCGS-MC will comply with the Department of Defense (DoD) DCGS Enterprise interoperability and information sharing requirements by migrating select processing, exploitation, analysis, and production capabilities into a single, integrated, net-centric baseline within the Marine Corps Intelligence, Surveillance and Reconnaissance Enterprise (MCISRE). This baseline will enable MCISRE analysts to deliver tactically focused, operational and strategic intelligence at the tactical edge throughout all phases of operations and will provide relevant, precise decision support for Joint Task Force (JTF), Marine Air Ground Task Force (MAGTF), and subordinate Marine units. The DoD DCGS Enterprise provides worldwide garrison, and forward projection of tactical ISR capabilities at the Joint Task Force (JTF) level and below. The DoD DCGS Enterprise enhances intelligence sharing within the Joint Services, the Intelligence Community, and Coalition Forces throughout all phases of operations. Each individual Military Service DCGS Program of Record provides unique and distinct capabilities to the overall DoD DCGS Enterprise. The DCGS-MC FoS currently consists of Enterprise DCGS Integration Backbone Services (EDS), Tactical Exploitation Group (TEG), Virtual Imagery Processing - Marine Corps (VIP-MC), and Topographic Production Capability (TPC). These capabilities will provide the USMC Geospatial Intelligence (GEOINT) analysts with the ability to process, disseminate, exploit, analyze, and produce intelligence for discoverability via EDS on the DCGS Integrated Backbone (DIB). Future enhancements will include All Source Fusion (ASF) and Signals Intelligence (SIGINT) capabilities. The specific content of each enhancement will be determined by an integrated assessment of user needs, technology readiness, risk mitigation, and affordability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Test and Evaluation	1.954	8.683	5.041	0.000	5.041
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue Post Milestone C System Engineering Test Review (SETR) activities associated with DCGS-MC Capability Drops, software integration and associated test events. - Continue test efforts in support of commonality of HW/SW baselines across GEOINT systems, such as DCGS-MC, VIPMC, TEG-RWS and TPC. - Continue Cyber Security Test Events to maintain system security postures. - Continue Operating System (Win10) upgrade integration into DCGS-MC GEOINT Systems.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 2268 / *Distributed Common Ground System (DCGS-MC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate integration and interoperability testing of a Joint Worldwide Intelligence Communications System (JWICS) Secret Internet Protocol Router Network (SIPRNet) Cross Doman Solution (CDS) that will be part of the DCGS portfolio Approved Acquisition Objective and facilitate the ability to share higher level intelligence to a broader audience for analysis and action. - Initiate Joint Strike Fighter (JSF) requirements, including initiation and test efforts for approximately 35 Tactical Exploitation Group (TEG) and 18 Topographic Production Capability (TPC) assets in support of JSF squadrons in order to capture increased data sensing capability with newer aviation platforms. - Initiate test events associated with GEOINT hardware refresh. - Initiate test events associated with Imagery hardware refresh. - Initiate software and hardware consolidation studies to support the development of the Common GEOINT Server. - Initiate integration, testing and cyber security certification or NGA iStore Integrated Product Library software into DCGS-MC Programs of Record. - Initiate software development efforts to provide enhanced software capabilities within the current Enterprise DCGS Integration Backbone (DIB) Services (EDS) System baseline. - Initiate integration, test and cyber security certification efforts to integrate ArcGIS Portal within the DCGS-MC Programs of Record. - Initiate study to evaluate process to integrate Enterprise HUB (EHUB) capability into DCGS-MC.					
FY 2019 Base Plans: - Continue Post Milestone C SETR activities associated with DCGS-MC Capability Drops, software integration and associated test events. - Continue test efforts in support of commonality of HW/SW baselines across GEOINT systems, such as DCGS-MC, VIP-MC, TEG-RWS and TPC. - Continue Cyber Security Test Events to maintain system security postures. - Continue integration and interoperability testing of a JWICS SIPRNet CDS that will be part of the DCGS portfolio Approved Acquisition Objective (AAO) and facilitate the ability to share higher level intelligence to a broader audience for analysis and action. - Continue test events associated with GEOINT hardware refresh. - Continue test events associated with Imagery hardware refresh.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 2268 / *Distributed Common Ground System (DCGS-MC)*

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 and hardware consolidation studies to support the development of the Common GEOINT Server and Common Workstation. - Continue software development efforts to provide enhanced software capabilities within the current EDS System baseline. - Initiate integrating EHUB capability into DCGS-MC - Initiate integrating ASF capability into DCGS-MC. - Initiate integrating SIGINT capability into DCGS-MC. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $3.642M from FY18 to FY19 is attributed to the completion of the Win10 upgrade and integration, testing, and certification of JSF requirements, NGA iStore software; GEOINT capabilities; and ArcGIS Portal within the DCGS-MC Program of Record. Additionally, funds supported the completion of initiation and test efforts for TEG and TPC assets in support of JSF squadrons in order to capture increased data sensing capability with newer aviation platforms.					
Title: Management Services - Engineering and Technical Services	0.125	4.184	2.646	0.000	2.646
Articles:	-	-	-	-	-
FY 2018 Plans: - Continue support for systems engineering, interoperability analysis, acquisition planning, and systems integration expertise. - Continue support for research and development activities that impact the acquisition of military intelligence, surveillance, and reconnaissance systems. - Continue RTMs for all DCGS-MC requirements to KPPs, KSAs through systems and sub-systems specifications and requirements. - Continue support for program ECPs as necessary. - Continue systems requirements review and utilize DMO to refine all system requirements through the RDP. - Complete system requirement analysis and review for future software releases to include ASF and SIGINT. - Initiate DCGS-MC GEOINT support for software integration of applications such as ArcGIS Portal, iSTORE, Commercial Joint Mapping Toolkit (CJMTK), and Environment for Visualizing Images (ENVI). - Initiate support for DCGS-MC GEOINT software enhancements as identified through configuration control board and engineering review boards in response to OPFOR requirements.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 2268 / *Distributed Common Ground System (DCGS-MC)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Initiate support for research and development activities to integrate ASF and SIGINT capability into DCGS-MC. ***FY 2019 Base Plans:*** -Continue support for systems engineering, interoperability analysis, acquisition planning, and systems integration expertise. - Continue support for research and development activities that impact the acquisition of military intelligence, surveillance, and reconnaissance systems. - Continue RTMs for all DCGS-MC requirements to KPPs, KSAs through systems and sub-systems specifications and requirements. - Continue support for program ECPs as necessary. - Continue systems requirements review and utilize DMO to refine all system requirements through the RDP. - Continue support for DCGS-MC GEOINT software enhancements as identified through configuration control board and engineering review boards in response to OPFOR requirements. - Continue support for research and development activities to integrate ASF capability into DCGS-MC. - Continue support for research and development activities to integrate SIGINT capability into DCGS-MC. - Initiate support for research and development activities to integrate garrison EHUB into DCGS-MC. - Initiate support for research and development activities to consolidate software and hardware for common GEOINT servers and workstations. - Complete DCGS-MC GEOINT support for software integration of applications such as ArcGIS Portal, iSTORE, CJMTK, and ENVI. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The decrease of $1.538M from FY18 to FY19 is attributed to the completion of system requirement analysis and review for future software releases to include All Source Fusion (ASF) and Signals Intelligence (SIGINT).					
Accomplishments/Planned Programs Subtotals	2.079	12.867	7.687	0.000	7.687

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 4767: *Distributed Common Ground System (DCGS-MC)*	12.531	13.462	16.081	-	16.081	16.792	14.230	12.883	15.279	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 2268 / *Distributed Common Ground System (DCGS-MC)*

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 Acquisition Strategy shall follow a hybrid approach consisting of a viable mix of alternatives that allows flexibility, agility and rapid fielding of new capabilities. An evolutionary acquisition approach will provide users with time-phased increments of capabilities that (while less than the full requirement), promote earlier delivery, improve affordability, and reduce risk. The evolutionary approach enables DCGS-MC to effectively assess and leverage emerging technologies to accelerate introduction into MCISRE. The DCGS-MC capabilities will be fielded in increments through operational capability drops.

E. Performance Metrics

-Quarterly Dashboard Input
-IOC

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 2268 / *Distributed Common Ground System (DCGS-MC)*	

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
DCGS PRIOR YEAR CUMULATIVE FUNDING	Various	N/A : N/A	55.765	0.000		0.000		0.000		-		0.000	0.000	55.765	-
		Subtotal	55.765	0.000		0.000		0.000		-		0.000	0.000	55.765	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
DCGS PRIOR YEAR CUMULATIVE FUNDING	Various	N/A : N/A	7.341	0.000		0.000		0.000		-		0.000	0.000	7.341	-
		Subtotal	7.341	0.000		0.000		0.000		-		0.000	0.000	7.341	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
DCGS PRIOR YEAR CUMULATIVE FUNDING	Various	N/A : N/A	4.054	0.000		0.000		0.000		-		0.000	0.000	4.054	-
DCGS Ctr Support	Various	SSCA : Charleston, SC	1.466	0.127	Nov 2016	4.059	Dec 2017	2.295	Dec 2018	-		2.295	Continuing	Continuing	Continuing
DCGS GEOINT	Various	NSWC Crane : Crane, IN	0.000	0.000		0.000		0.400	Nov 2018	-		0.400	0.000	0.400	-
EDS CDS Initial Capibility Enhancments	C/CPFF	SSCA : Charleston, SC	0.000	0.000		3.391	Dec 2017	0.000		-		0.000	0.000	3.391	-
DI2E Technical Services	WR	NSMA : Washington DC	0.000	0.300	Aug 2017	0.000		0.300	Aug 2019	-		0.300	0.000	0.600	-
DCGS Gov Support	WR	SSCA : Charleston, SC	1.466	0.123	Nov 2016	0.000		2.046	Dec 2018	-		2.046	0.000	3.635	-
TPC Integration	C/CPFF	NSWC Crane : Crane, IN	0.330	0.202	Nov 2016	0.500	Nov 2017	0.000		-		0.000	0.000	1.032	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	Project (Number/Name) 2268 / *Distributed Common Ground System (DCGS-MC)*	

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
Technical Engineering (SDL)	WR	NRL : Washington DC	0.000	1.202	Mar 2017	0.733	Nov 2017	0.000		-		0.000	0.000	1.935	-
		Subtotal	7.316	1.954		8.683		5.041		-		5.041	Continuing	Continuing	N/A

Remarks

Decrease of $3.642M from FY18 to FY19 in Test and Evaluation is attributed to the completion of multiple integration and certification test events as indicated in the R2A.

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
DCGS	MIPR	CECOM : Stafford, Va	1.418	0.125	Nov 2016	0.158	Oct 2017	0.300	Nov 2018	-		0.300	0.000	2.001	-
DCGS EDS	C/CPFF	SSCA : Charleston, SC	0.000	0.000		2.675	Dec 2017	0.926	Dec 2018	-		0.926	0.000	3.601	-
DCGS GEOINT	C/CPFF	SSCA : Charleston, SC	0.000	0.000		1.351	Dec 2017	1.420	Dec 2018	-		1.420	0.000	2.771	-
DCGS PRIOR YEAR CUMULATIVE FUNDING	Various	N/A : N/A	0.030	0.000		0.000		0.000		-		0.000	0.000	0.030	-
		Subtotal	1.448	0.125		4.184		2.646		-		2.646	0.000	8.403	N/A

Remarks

Decrease of $1.538M from FY18 to FY19 in Management Services is attributed to the completion of software releases as indicated in the R2A.

	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	71.870	2.079		12.867		7.687		-		7.687	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 2268 / *Distributed Common Ground System (DCGS-MC)*

DCGS-MC Program Schedule

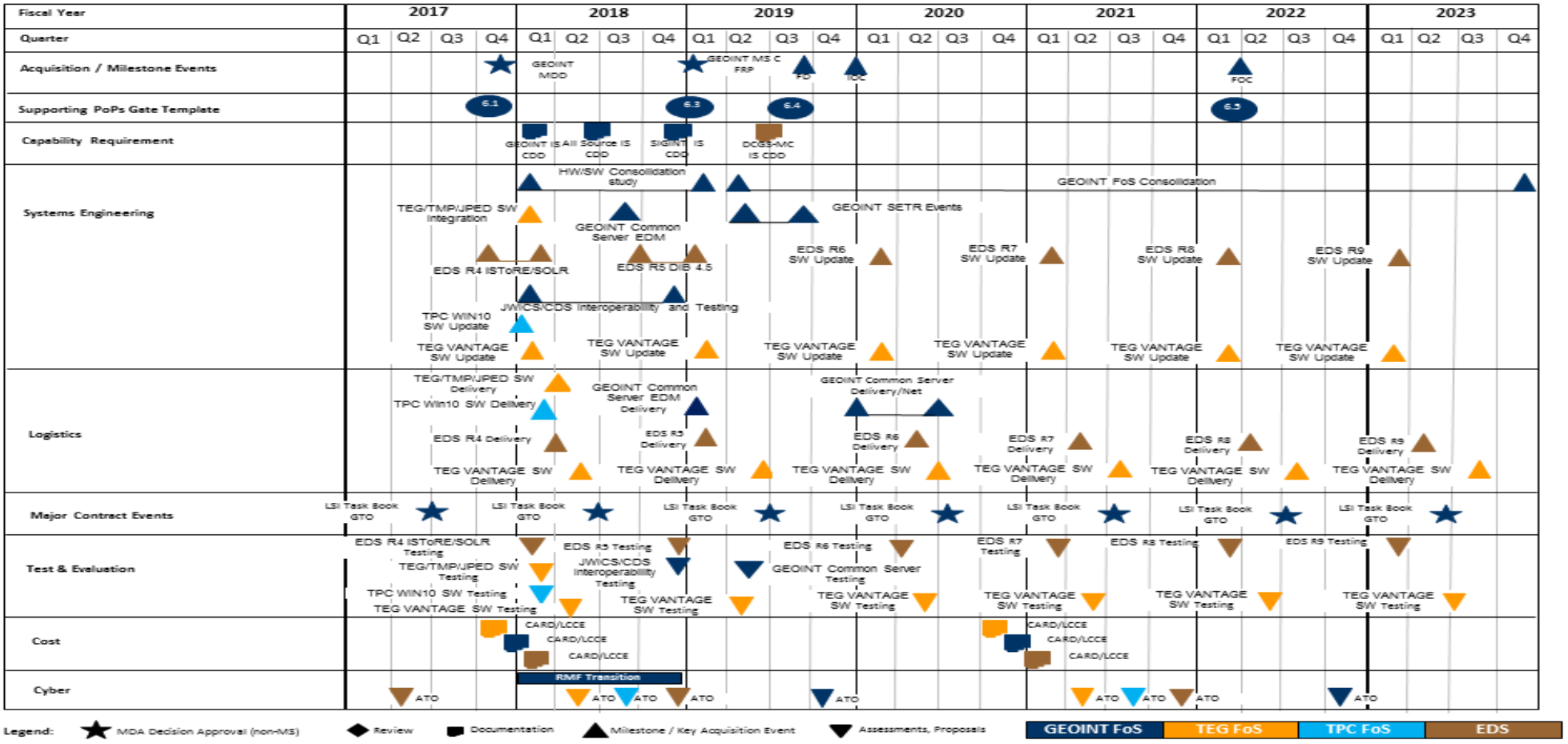


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208M / *(U)Distributed Common Ground/Surface Systems*	**Project (Number/Name)** 2268 / *Distributed Common Ground System (DCGS-MC)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2268				
TPC FoS Software Delivery	1	2018	1	2018
JWICS/CDS Interoperability Testing	1	2018	4	2018
GEOINT MS C FRP	1	2019	1	2019
GEOINT Common Server Testing	2	2019	2	2019
GEOINT Fielding Decision	3	2019	3	2019
GEOINT Common Server Delivery/Net	1	2020	3	2020
GEOINT IOC	1	2020	1	2020

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305208N *I Distributed Common Ground 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**
Total Program Element	226.630	44.564	46.150	42.846	-	42.846	41.474	35.339	36.288	37.046	Continuing	Continuing
2174: *Distributed Common Ground System-Navy (DCGS-N)*	205.211	1.630	0.325	0.222	-	0.222	0.133	0.140	0.145	0.151	Continuing	Continuing
2227: *Distributed Common Ground System (DCGS-N) Inc 2*	21.419	42.934	45.825	42.624	-	42.624	41.341	35.199	36.143	36.895	102.208	404.588
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** MN40, M464												

A. Mission Description and Budget Item Justification

The Distributed Common Ground System - Navy (DCGS-N) is the Navy's portion of the Under Secretary of Defense, Intelligence (USD (I)) DCGS Family of Systems (FoS). The Department of Defense (DoD) has defined a DCGS architecture that will be compatible and interoperable across all of the Services' Intelligence, Surveillance and Reconnaissance (ISR) systems and operations. DCGS accesses and ingests data from spaceborne, airborne, subsurface, and surface ISR collection assets, intelligence databases and intelligence producers. This collected data is shared across a Joint enterprise using the DCGS Integration Backbone (DIB) and in time, the Defense Intelligence Information Enterprise (DI2E) to enhance access and sharing of ISR information across Joint forces through the use of common enterprise standards and services. DCGS FoS supports Joint Task Force (JTF)-level and below combat operations with critical intelligence for battle management and information dominance across the full spectrum of operations, including peace, conflict, war, and Overseas Contingency Operations (OCO). DCGS is a cooperative effort between the services, agencies, and DoD to provide systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms. DCGS-N core components include the analyst workstation from the Global Command and Control System (GCCS) - Integrated Imagery and Intelligence (I3), Generic Area Limitation Environment (GALE) Signals Intelligence (SIGINT), Common Geo-positioning Services (CGS), Image Product Library (IPL) or Information Store (iSToRE), Modernized Integrated Database (MIDB), Joint Concentrator Architecture (JCA) and Track Management Services (TMS).

The DCGS-N system represents the integration of 1) The processing and exploitation of tactical and Imagery Intelligence (IMINT) and SIGINT; 2) Precision target geopositioning, mensuration, and imagery dissemination capabilities; 3) Selected national IMINT requirements and processing capabilities from the National Geospatial-Intelligence Agency (NGA); and 4) Sharing of Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) and Command and Control information via DIB, DI2E, and Net-Centric Enterprise Services (NCES) standards with a wide range of customers (e.g., Global Command and Control System - Maritime (GCCS-M), Joint Mission Planning System (JMPS), and many others).

The DCGS-N Enterprise Node (DEN), which incorporates current DIB standards and DI2E policy, facilitates interoperability and data sharing among the DCGS FoS. DCGS-N ensures compliance with the DoD DCGS network architecture.

The Navy is establishing an ISR Enterprise way ahead that will emphasize a reach back strategy to provide intelligence products to support deployed ship and shore operations. The Navy will also migrate to a Service Oriented Architecture (SOA) that requires the integration and testing of a Maritime ISR Enterprise capabilities,

migration of ISR applications to a SOA environment, and integration to leverage a Common Computing Environment (CCE) and the Intelligence Community Information Technology Enterprise (IC ITE). DCGS-N will also become the focal point for migration of Maritime Domain Awareness (MDA) fusion and analysis Maritime Fusion & Analysis (MFAS) tool applications for the Navy. Additionally, Intelligence Surveillance and Reconnaissance (ISR) funding supports development and integration efforts to fuse Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) data collected, exploited and disseminated by ISR systems with other intelligence data and automatically provide to shipboard combat systems to support kinetic (bombs, mortars, missiles, bullets)and non-kinetic fires (electronic attack, lasers, cyber-attack)and more effective exploitation of the electromagnetic spectrum. ISR systems will play key roles in enabling the national-to-tactical integration necessary for an integrated maritime targeting capability in support of kinetic and non-kinetic fires.

Distributed Common Ground System-Navy (DCGS-N) Increment 2 addresses a critical shortfall in Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) capability and capacity to support operational, tactical planning, and execution across the full range of joint military operations. Existing TCPED shortfalls will be exacerbated by planned Navy, Joint, and Allied fielding of new ISR platforms. Currently fielded systems provide localized processing capabilities that will be overwhelmed in future years without a significant change in the way the Navy processes, exploits and disseminates intelligence data. DCGS-N Increment 2 will deliver all source fusion and analytical capabilities; provide Maritime Domain Awareness (MDA) capabilities and integrate TCPED capabilities to improve the use and analysis of sensor and platform data. DCGS-N Increment 2 will be based on an enterprise solution to share this information across commands, services, and agencies to promote shared situational awareness. DCGS-N Increment 2 consists of multiple releases. The first release (Fleet Capability Release 1 (FCR-1)) provides an enhanced Navy ISR enterprise that converges and builds on the DCGS-N Increment 1 and MDA Enterprise Nodes; leverages the Defense Intelligence Information Enterprise (DI2E); is compliant with the Common Computing Environment (CCE) and the Community Information Technology Enterprise (IC ITE); federates ISR and TCPED workflow and production improving throughout the automation; exploits new and evolving unmanned systems sensor data; provides Multi-Intelligence (Multi-INT) cross-queuing and modular tools. The second release (Fleet Capability Release 2 (FCR-2), enhances afloat ISR capabilities by providing a set of software centric tools providing Multi-INT fusion and analysis, behavior prediction and intelligent knowledge management designed to operate in disconnected or denied communications environment. Follow-on releases will be developed based on Fleet requirements.

In FY19, DCGS-N Increment 1 will continue development, integration and regression testing required to remain aligned with national imagery standards to be incorporated into technology refreshes for End-of-Life upgrades.

In FY19, DCGS-N Increment 2 will conduct the Fielding Technical Review and Fielding Decision Review of Fleet Capability Release 1 (FCR-1), which comprises the ashore backbone of the Navy's ISR&T enterprise and will contain enterprise data and analytics, and synchronize the Common Intelligence Picture across the Fleet. This portion of the DCGS-N Increment 2 system will support future test events. DCGS-N Increment 2 will complete integration of Fleet Capability Release 2 (FCR-2) which comprises the afloat nodes of the Navy's ISR&T enterprise. DCGS-N Increment 2 will conduct an In Progress Test Review and Integrated Test of the FCR-2 build including rigorous cyber security testing. DCGS-N Increment 2 will continue developing hardware specifications for Initial Operational Test and Evaluation (IOT&E), and begin planning for Fleet Capability Release 3 (FCR-3) including developing the Requirements Definition Package (RDP), preparing for the Build Technical Review and Build Decision. DCGS-N Increment 2 will continue Passive Targeting Efforts leveraging Office of Naval Research (ONR) Electromagnetic Battle Management (EMBM) Future Naval Capabilities (FNC) to network and fuse Passive Targeting Data.

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 7: *Operational Systems Development*		R-1 Program Element (Number/Name) PE 0305208N *I Distributed Common Ground Sys*			
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	44.571	46.150	48.207	-	48.207
Current President's Budget	44.564	46.150	42.846	-	42.846
Total Adjustments	-0.007	0.000	-5.361	-	-5.361
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-5.048	-	-5.048
• Rate/Misc Adjustments	0.000	0.000	-0.313	-	-0.313
• Congressional General Reductions Adjustments	-0.007	-	-	-	-

Change Summary Explanation

The FY 2019 funding request was reduced by ($0.621) 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 FY19 DCGS-N funding request was reduced by $2.3M to account for the availability of prior year execution balances.

The $103K decrease for DCGS-N Increment 1 from FY18 to FY19 is a result of Efficiencies, Common Geospatial Services (CGS), and associated systems engineering services.

Schedule: DCGS-N Increment 2's fielding has been updated to reflect PEO C4I synchronized plan.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0305208N / *Distributed Common Ground Sys*				Project (Number/Name) 2174 / *Distributed Common Ground System-Navy (DCGS-N)*			
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**
2174: *Distributed Common Ground System-Navy (DCGS-N)*	205.211	1.630	0.325	0.222	-	0.222	0.133	0.140	0.145	0.151	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: MN40

A. Mission Description and Budget Item Justification

The Distributed Common Ground System - Navy (DCGS-N) is the Navy's portion of the Under Secretary of Defense, Intelligence (USD (I)) DCGS Family of Systems (FoS). The Department of Defense (DoD) has defined a DCGS architecture that will be compatible and interoperable across all of the Services' Intelligence, Surveillance and Reconnaissance (ISR) systems and operations. DCGS accesses and ingests data from space borne, airborne, subsurface, and surface ISR collection assets, intelligence databases and intelligence producers. This collected data is shared across a Joint enterprise using the DCGS Integration Backbone (DIB) and in time, the Defense Intelligence Information Enterprise (DI2E) to enhance access and sharing of ISR information across Joint forces through the use of common enterprise standards and services. DCGS FoS supports Joint Task Force (JTF)-level and below combat operations with critical intelligence for battle management and information dominance across the full spectrum of operations, including peace, conflict, war, and Overseas Contingency Operations (OCO). DCGS is a cooperative effort between the services, agencies, and DoD to provide systems capable of receiving, processing, exploiting, and disseminating data from airborne and national reconnaissance platforms. DCGS-N core components include the analyst workstation from the Global Command and Control System (GCCS) - Integrated Imagery and Intelligence (I3), Generic Area Limitation Environment (GALE) Signal Intelligence (SIGINT), Common Geo-positioning Services (CGS), Image Product Library (IPL), Modernized Integrated Database (MIDB), Joint Concentrator Architecture (JCA) and Track Management Services (TMS).

The DCGS-N system represents the integration of 1) The processing and exploitation of tactical and Imagery Intelligence (IMINT) and SIGINT; 2) Precision target geopositioning, mensuration, and imagery dissemination capabilities; 3) Selected national IMINT requirements and processing capabilities from the National Geospatial-Intelligence Agency (NGA); and 4) Sharing of Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) and Command and Control information via DIB, DI2E, and Net-Centric Enterprise Services (NCES) standards with a wide range of customers (e.g., Global Command and Control System - Maritime (GCCS-M), Joint Mission Planning System (JMPS), and many others).

The DCGS-N Enterprise Node (DEN), which incorporates current DIB standards and DI2E policy, facilitates interoperability and data sharing among the DCGS FoS. DCGS-N ensures compliance with the DoD DCGS network architecture.

The Navy is establishing an ISR Enterprise way ahead that will emphasize a reach back strategy to provide intelligence products to support deployed ship and shore operations. The Navy will also migrate to a Service Oriented Architecture (SOA) that requires the integration and testing of Maritime ISR Enterprise capabilities, migration of ISR SOA applications, integration to leverage a Common Computing Environment (CCE) and the Intelligence Community Information Technology Enterprise (IC ITE). Additionally, DCGS-N will become the focal point for migration of Maritime Domain Awareness (MDA) fusion and analysis Maritime Fusion & Analysis (MFAS) tool applications for the Navy.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** 2174 / *Distributed Common Ground System-Navy (DCGS-N)*

In FY19, DCGS-N Increment 1 will continue development, integration and regression testing required to remain aligned with national imagery standards to be incorporated into technology refreshes for End-of-Life upgrades.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Distributed Common Ground System-Navy (DCGS-N) Increment 1	1.630	0.325	0.222	0.000	0.222
Articles:	-	-	-	-	-
FY 2018 Plans: In FY18, DCGS-N Increment 1 will continue development, integration and regression testing that is required to align with emerging national imagery standards for tech refreshes and End-of-Life Upgrades.					
FY 2019 Base Plans: In FY19, DCGS-N Increment 1 will continue development, integration and regression testing that is required to remain aligned with emerging national imagery standards for tech refreshes and End-of-Life Upgrades.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The $103K decrease for DCGS-N Increment 1 from FY18 to FY19 is a result of Efficiencies, Common Geospatial Services (CGS), and associated systems engineering services.					
Accomplishments/Planned Programs Subtotals	1.630	0.325	0.222	0.000	0.222

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 2914: *Distributed Common Ground System-Navy (DCGS-N)*	23.610	20.182	12.896	-	12.896	20.733	20.876	14.895	25.692	234.735	613.065

Remarks

0305208N/2914 is a shared Program Element (PE) with Distributed Common Ground System-Navy (DCGS-N) Increment 1, Increment 2, and Intelligence Carry-On Program (ICOP)

D. Acquisition Strategy

DCGS-N program utilizes mature Commercial-Off-The-Shelf (COTS) and Governmental-Off-The-Shelf (GOTS) capabilities. The Navy adapts and integrates these capabilities and ensures interoperability with the DCGS Integration Backbone (DIB) standards and Defense Intelligence Information Enterprise (DI2E) policies.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** 2174 / *Distributed Common Ground System-Navy (DCGS-N)*

Integration of DCGS-N Increment 1 components has transitioned from Government-led to Industry-led based on the award of DCGS-N Increment 1 Prime Mission Product (PMP) contract.

E. Performance Metrics

DCGS-N Increment 1 Goal: Meet national imagery standards.

DCGS-N Increment 1 Metric: Support development, integration and regression testing required to align with emerging national imagery standards.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305208N / *Distributed Common Ground Sys*	Project (Number/Name) 2174 / *Distributed Common Ground System-Navy (DCGS-N)*	

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	109.867	0.000		0.000		0.000		-		0.000	0.000	109.867	-
Systems Engineering	WR	SSC LANT : Charleston, SC	12.142	0.181	Nov 2016	0.150	Jan 2018	0.075	Nov 2018	-		0.075	Continuing	Continuing	Continuing
Integration Assembly & Test	WR	SSC PAC : San Diego, CA	0.150	0.100	Nov 2016	0.000		0.000		-		0.000	0.000	0.250	-
Integration Assembly & Test	C/CPFF	NSWC China Lake : China Lake, CA	0.000	0.593	Aug 2017	0.100	Jan 2018	0.100	Nov 2018	-		0.100	0.000	0.793	-
Government Technical Oversight (Dev)	WR	SSC LANT : Charleston, SC	0.200	0.191	Nov 2016	0.075	Jan 2018	0.047	Nov 2018	-		0.047	0.000	0.513	-
		Subtotal	122.359	1.065		0.325		0.222		-		0.222	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	43.904	0.000		0.000		0.000		-		0.000	0.000	43.904	-
Development Support	WR	SSC LANT : Charleston, SC	1.680	0.185	Nov 2016	0.000		0.000		-		0.000	0.000	1.865	-
		Subtotal	45.584	0.185		0.000		0.000		-		0.000	0.000	45.769	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	23.423	0.000		0.000		0.000		-		0.000	0.000	23.423	-
Developmental Test & Evaluation	WR	SSC LANT : Charleston, SC	2.747	0.300	Nov 2016	0.000		0.000		-		0.000	0.000	3.047	-
		Subtotal	26.170	0.300		0.000		0.000		-		0.000	0.000	26.470	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305208N / *Distributed Common Ground Sys*	Project (Number/Name) 2174 / *Distributed Common Ground System-Navy (DCGS-N)*	

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	9.534	0.000		0.000		0.000		-		0.000	0.000	9.534	-
Government Engineering Support	WR	SSC LANT : Charleston, SC	1.564	0.080	Nov 2016	0.000		0.000		-		0.000	0.000	1.644	-
		Subtotal	11.098	0.080		0.000		0.000		-		0.000	0.000	11.178	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	205.211	1.630		0.325		0.222		-		0.222	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305208N / *Distributed Common Ground Sys*	Project (Number/Name) 2174 / *Distributed Common Ground System-Navy (DCGS-N)*	

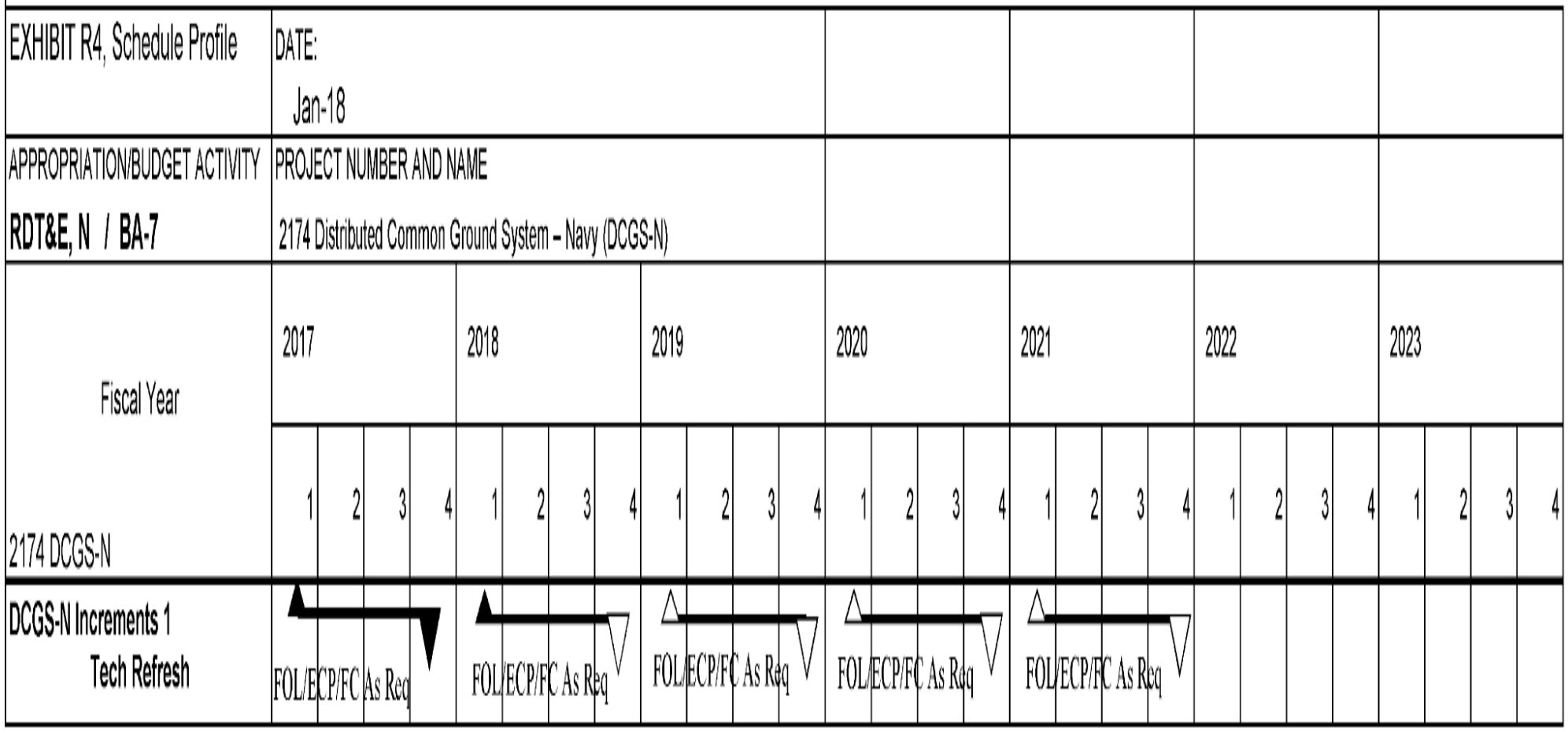


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** 2174 / *Distributed Common Ground System-Navy (DCGS-N)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2174				
DCGS-N Increment 1 Tech Refresh	1	2017	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0305208N / *Distributed Common Ground Sys*				Project (Number/Name) *2227 / Distributed Common Ground System (DCGS-N) Inc 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**
2227: *Distributed Common Ground System (DCGS-N) Inc 2*	21.419	42.934	45.825	42.624	-	42.624	41.341	35.199	36.143	36.895	102.208	404.588
Quantity of RDT&E Articles		-	1	1	-	1	-	-	-	-		

Project MDAP/MAIS Code: M464

Note

Cost-To-Complete reflects Distributed Common Ground System - Navy (DCGS-N) Increment 2 only. DCGS-N Increment 2 reflects Department of Navy Component Cost Position (CCP).

A. Mission Description and Budget Item Justification

Distributed Common Ground System-Navy (DCGS-N) Increment 2 addresses a critical shortfall in Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) capability and capacity to support operational, tactical planning, and execution across the full range of joint military operations. Existing TCPED shortfalls will be exacerbated by planned Navy, Joint, and Allied fielding of new ISR platforms. Currently fielded systems provide localized processing capabilities that will be overwhelmed in future years without a significant change in the way the Navy processes, exploits and disseminates intelligence data. DCGS-N Increment 2 will deliver all source fusion and analytical capabilities; provide Maritime Domain Awareness (MDA) capabilities and integrate TCPED capabilities to improve the use and analysis of sensor and platform data. DCGS-N Increment 2 will be based on an enterprise solution to share this information across commands, services, and agencies to promote shared situational awareness. DCGS-N Increment 2 consists of multiple releases. The first release (Fleet Capability Release 1 (FCR-1)) provides an enhanced Navy ISR enterprise that converges and builds on the DCGS-N Increment 1 and MDA Enterprise Nodes; leverages the Defense Intelligence Information Enterprise (DI2E); is compliant with the Common Computing Environment (CCE) and the Community Information Technology Enterprise (IC ITE); federates ISR and TCPED workflow and production improving throughout the automation; exploits new and evolving unmanned systems sensor data; provides Multi-Intelligence (Multi-INT) cross-queuing and modular tools. The second release (Fleet Capability Release 2 (FCR-2), enhances afloat ISR capabilities by providing a set of software centric tools providing Multi-INT fusion and analysis, behavior prediction and intelligent knowledge management designed to operate in disconnected or denied communications environment. Follow-on releases will be developed based on Fleet requirements.

In FY19, DCGS-N Increment 2 will conduct the Fielding Technical Review and Fielding Decision Review of Fleet Capability Release 1 (FCR-1) which comprises the ashore backbone of the Navy's Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) enterprise and will contain enterprise data and analytics, and synchronize the Common Intelligence Picture across the Fleet. This portion of the DCGS-N Increment 2 system will support future test events. DCGS-N Increment 2 will complete integration of Fleet Capability Release 2 (FCR-2) which comprises the afloat nodes of the Navy's ISR&T enterprise. DCGS-N Increment 2 will conduct an In Progress Test Review and Integrated Test of the FCR-2 build including rigorous cyber security testing. DCGS-N Increment 2 will continue developing hardware specifications for Initial Operational Test and Evaluation (IOT&E), and begin planning for Fleet Capability Release 3 (FCR-3) including developing the Requirements Definition Package (RDP), preparing for the Build Technical Review and Build Decision. DCGS-N Increment 2 will continue Passive Targeting Efforts leveraging Office of Naval Research (ONR) Electromagnetic Battle Management (EMBM) Future Naval Capabilities (FNC) to network and fuse passive targeting Data.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** *2227 / Distributed Common Ground System (DCGS-N) Inc 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: Distributed Common Ground System-Navy (DCGS-N) Increment 2	42.934	45.825	42.624	0.000	42.624
Articles:	-	1	1	-	1

FY 2018 Plans:

DCGS-N Increment 2 will complete integration of Fleet Capability Release 1 (FCR-1) which comprises the ashore backbone of the Navy's Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) enterprise and will contain enterprise data and analytics and synchronize the Common Intelligence Picture across the Fleet. This portion of the DCGS-N Increment 2 system will support future test events. DCGS-N Increment 2 will develop one (1) unit for Environmental Qualification Testing (EQT) and begin planning for Initial Operational Test and Evaluation (IOT&E) hardware design and acquisition. At the conclusion of FCR-1 integration the program will conduct an In Progress Test Review and integrated test of the of the FCR-1 build including rigorous cyber security testing culminating in a Fielding Technical Review to support the FCR-1 Fielding Decision Review in FY19. Other integration efforts include maritime object of interest track data management, correlation of limited data sources to maritime objects of interest, recognition of patterns of life from maritime objects of interest historical data, automate collection target area prediction; all with rigorous cyber security embedded into each facet of the capability. DCGS-N Increment 2 continues to develop a standard software baseline for the DCGS Family of Systems (FoS). DCGS-N Increment 2 begins integration efforts to fuse ISR&T data collected, exploited and disseminated by Intelligence, Surveillance, Reconnaissance (ISR) systems with other intelligence data and automatically provides shipboard combat systems to support kinetic and non-kinetic fires and more effective exploitation of the electromagnetic spectrum. ISR systems play key roles in enabling the national-to-tactical integration necessary for an integrated maritime targeting capability in support of kinetic and non-kinetic fires. DCGS-N Increment 2 begins planning for Fleet Capability Release 2 (FCR-2) including approval of the Requirements Definition Package (RDP), Build Technical Review, and Build Decision. DCGS-N Increment 2 will continue to use available contracting vehicles and hybrid government/industry integration efforts to provide capability and capacity through Fleet Capability Release 2 (FCR-2). DCGS-N Increment 2 will award an Integration Contract based on continuous market research that will address integration of commercial components procured for the DCGS-N Increment 2 baseline. This Integration Contract will cover integration of capabilities in FCR-3 through Fleet Capability Release 5 (FCR-5), and ensure Distributed Common Ground System-Navy (DCGS-N) Increment 2 interoperability with the DCGS-N Family of System (FoS), the multi-service and Intelligence Community DCGS FoS, and the Consolidated Afloat Networks and Enterprise Services (CANES) system. Increment 2 will begin establishing Electromagnetic Battle Management (EMBM) Future Naval Capabilities (FNC) to network and fuse passive targeting data. Passive Targeting efforts include the transition to cloud architecture, enhancement and integration of data models to ensure interoperability and

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** *2227 / Distributed Common Ground System (DCGS-N) Inc 2*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
compatibility with Intelligence Community (IC) and the install and test of integrated capabilities. Distributed Common Ground System-Navy (DCGS-N) Increment 2 continues to develop statutory/regulatory acquisition and training documentation as required. ***FY 2019 Base Plans:*** In FY19, DCGS-N Increment 2 will conduct the Fielding Technical Review and Fielding Decision Review of Fleet Capability Release 1 (FCR-1) which comprises the ashore backbone of the Navy's Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) enterprise and will contain enterprise data and analytics, and synchronize the Common Intelligence Picture across the Fleet. This portion of the DCGS-N Increment 2 system will support future test events. DCGS-N Increment 2 will complete integration of Fleet Capability Release 2 (FCR-2) which comprises the afloat nodes of the Navy's ISR&T enterprise. DCGS-N Increment 2 will conduct an In Progress Test Review and Integrated Test of the FCR-2 build including rigorous cyber security testing. DCGS-N Increment 2 will continue to develop a standard software baseline for the DCGS Family of Systems (FoS). DCGS-N Increment 2 will begin planning for Fleet Capability Release 3 (FCR-3) including developing the Requirements Definition Package (RDP), preparing for the Build Technical Review and Build Decision. DCGS-N Increment 2 will develop one (1) unit for Initial Operational Test and Evaluation (IOT&E) hardware design and acquisition. DCGS-N Increment 2 will continue Passive Targeting Efforts leveraging Office of Naval Research (ONR) Electromagnetic Battle Management (EMBM) Future Naval Capabilities (FNC) to network and fuse Passive Targeting Data. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY19 funding profile shows a decrease from FY18, in reality, the funding level is in line with the FY18 requirement as it takes into consideration prior year execution.					
Accomplishments/Planned Programs Subtotals	42.934	45.825	42.624	0.000	42.624

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 2914: *Distributed Common Ground System-Navy (DCGS-N)*	23.610	20.182	12.896	-	12.896	20.733	20.876	14.895	25.692	234.735	613.065

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** *2227 / Distributed Common Ground System (DCGS-N) Inc 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

Remarks

0305208N/2914 is a shared Program Element (PE) with Distributed Common Ground System - Navy (DCGS-N) Increment 1, Increment 2, and Intelligence Carry-On Program (ICOP).

D. Acquisition Strategy

The Distributed Common Ground System-Navy (DCGS-N) Increment 2 acquisition is based on the Department of Defense Instruction (DODI) 5000.02, Model 3, for incrementally fielded software intensive programs.

E. Performance Metrics

DCGS-N Increment 2 Goal: Support afloat forces through a robust enterprise Intelligence Surveillance, Reconnaissance and Targeting (ISR&T) capability, satisfying maritime needs for processing, exploitation and dissemination.
DCGS-N Increment 2 Metric: Field Fleet Capability Release 1 (FCR-1), complete development of Fleet Capability Release 2 (FCR-2), and begin development of Fleet Capability Release 3 (FCR-3).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** *2227 / Distributed Common Ground System (DCGS-N) Inc 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
Integration Assembly & Test	WR	SSC PAC : San Diego, CA	5.239	8.871	Oct 2016	35.555	Oct 2017	19.172	Oct 2018	-		19.172	0.000	68.837	-
Primary Hardware Development	WR	SSC PAC : San Diego, CA	2.833	8.648	Oct 2016	3.780	Oct 2017	1.500	Oct 2018	-		1.500	0.000	16.761	-
Software Development	WR	SSC PAC : San Diego, CA	8.723	19.329	Oct 2016	0.000		0.000		-		0.000	0.000	28.052	-
Integration Assembly & Test	C/CPFF	Unknown : Unknown	0.000	0.000		0.125	Jul 2018	15.937	Dec 2018	-		15.937	171.322	187.384	-
Software Development	WR	SSC LANT : Charleston, SC	0.504	1.131	Oct 2016	0.000		0.000		-		0.000	0.000	1.635	-
Government Technical Oversite (Dev)	WR	SSC LANT : Charleston, SC	0.126	0.283	Oct 2016	0.780	Oct 2017	0.800	Oct 2018	-		0.800	0.000	1.989	-
		Subtotal	17.425	38.262		40.240		37.409		-		37.409	171.322	304.658	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	C/CPFF	SAIC : Columbia, MD	0.600	0.688	Dec 2016	2.041	Feb 2018	1.741	Dec 2018	-		1.741	0.000	5.070	-
Development Support	WR	SSC LANT : Charleston, SC	0.150	0.150	Oct 2016	0.171	Oct 2017	0.171	Oct 2018	-		0.171	9.888	10.530	-
Integrated Logistics Support	WR	SSC LANT : Charleston, SC	0.250	0.250	Oct 2016	0.053	Oct 2017	0.053	Oct 2018	-		0.053	0.000	0.606	-
Integrated Logistics Support	C/CPFF	SAIC : Columbia, MD	0.720	0.825	Dec 2016	0.330	Feb 2018	0.330	Dec 2018	-		0.330	0.000	2.205	-
		Subtotal	1.720	1.913		2.595		2.295		-		2.295	9.888	18.411	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305208N / *Distributed Common Ground Sys*	Project (Number/Name) *2227 / Distributed Common Ground System (DCGS-N) Inc 2*	

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/CPFF	SAIC : Columbia, MD	0.000	0.417	Dec 2016	0.265	Feb 2018	0.265	Dec 2018	-		0.265	0.000	0.947	-
Developmental Test & Evaluation	WR	SSC LANT : Charleston, SC	0.250	0.287	Oct 2016	0.240	Oct 2017	0.240	Oct 2018	-		0.240	4.416	5.433	-
Developmental Test & Evaluation	C/CPFF	JITC : Fort Meade, MD	0.800	0.000		0.100	Dec 2017	0.100	Oct 2018	-		0.100	0.000	1.000	-
Developmental Test & Evaluation	C/CPFF	COTF : Norfolk, VA	0.200	0.186	Nov 2016	0.420	Feb 2018	0.420	Nov 2018	-		0.420	0.000	1.226	-
		Subtotal	1.250	0.890		1.025		1.025		-		1.025	4.416	8.606	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	SPAWAR : San Diego, CA	0.100	0.256	Nov 2016	0.240	Nov 2017	0.240	Nov 2018	-		0.240	0.000	0.836	-
Government Engineering Support	WR	SSC LANT : Charleston, SC	0.154	0.154	Nov 2016	0.200	Nov 2017	0.200	Nov 2018	-		0.200	0.000	0.708	-
Program Management Support	C/CPFF	BAH : San Diego, CA	0.270	0.909	Nov 2016	1.010	Feb 2018	0.940	Nov 2018	-		0.940	0.000	3.129	-
Program Management Support	WR	SSC LANT : Charleston, SC	0.300	0.350	Oct 2016	0.290	Oct 2017	0.290	Oct 2018	-		0.290	8.165	9.395	-
Program Management Support	WR	SSC PAC : San Diego, CA	0.200	0.200	Oct 2016	0.225	Oct 2017	0.225	Oct 2018	-		0.225	0.000	0.850	-
		Subtotal	1.024	1.869		1.965		1.895		-		1.895	8.165	14.918	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	21.419	42.934		45.825		42.624		-		42.624	193.791	346.593	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** *2227 / Distributed Common Ground System (DCGS-N) Inc 2*

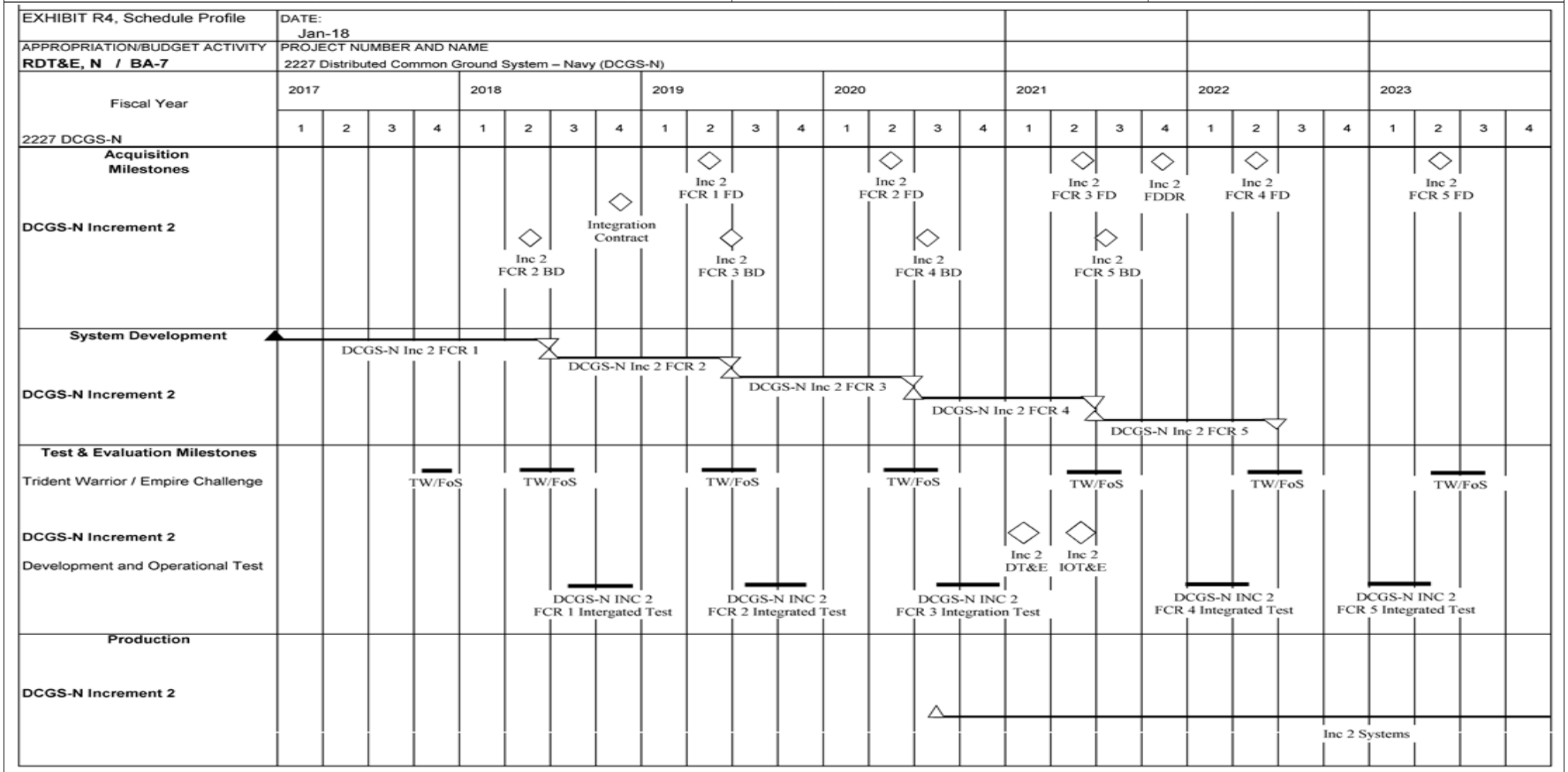


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** *2227 / Distributed Common Ground System (DCGS-N) Inc 2*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2227				
DCGS-N Inc 2 FCR-2 Build Decision (BD)	2	2018	2	2018
Integration Contract	4	2018	4	2018
DCGS-N Inc 2 FCR-1 Fielding Decision (FD)	2	2019	2	2019
DCGS-N Inc 2 FCR-3 Build Decision (BD)	2	2019	2	2019
DCGS-N Inc 2 FCR-2 Fielding Decision (FD)	2	2020	2	2020
DCGS-N Inc 2 FCR-4 Build Decision (BD)	3	2020	3	2020
DCGS-N Inc 2 FCR-3 Fielding Decision (FD)	2	2021	2	2021
DCGS-N Inc 2 FCR-5 Build Decision (BD)	3	2021	3	2021
DCGS-N Inc 2 FDDR	4	2021	4	2021
DCGS-N Inc 2 FCR-4 Fielding Decision (FD)	2	2022	2	2022
DCGS-N Inc 2 FCR-5 Fielding Decision (FD)	2	2023	2	2023
DCGS-N Inc 2 FCR-1 Development	1	2017	2	2018
DCGS-N Inc 2 FCR-2 Development	2	2018	2	2019
DCGS-N Inc 2 FCR-3 Development	2	2019	2	2020
DCGS-N Inc 2 FCR-4 Development	2	2020	2	2021
DCGS-N Inc 2 FCR-5 Development	2	2021	2	2022
Trident Warrior/DCGS Family of Systems (FoS) 2017	4	2017	4	2017
Trident Warrior/DCGS Family of Systems (FoS) 2018	2	2018	3	2018
DCGS-N Inc 2 FCR-1 Integrated Test	3	2018	4	2018
Trident Warrior/DCGS Family of Systems (FoS) 2019	2	2019	3	2019
DCGS-N Inc 2 FCR-2 Integrated Test	3	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305208N / *Distributed Common Ground Sys*	**Project (Number/Name)** *2227 / Distributed Common Ground System (DCGS-N) Inc 2*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Trident Warrior/DCGS Family of Systems (FoS) 2020	2	2020	3	2020
DCGS-N Inc 2 FCR-3 Integrated Test	3	2020	4	2020
DCGS-N Inc 2 DT&E	1	2021	1	2021
Trident Warrior/DCGS Family of Systems (FoS) 2021	2	2021	3	2021
DCGS-N Inc 2 IOT&E	2	2021	2	2021
DCGS-N Inc 2 FCR-4 Integrated Test	1	2022	2	2022
Trident Warrior/DCGS Family of Systems (FoS) 2022	2	2022	3	2022
DCGS-N Inc 2 Procurement	3	2020	4	2023
Trident Warrior/DCGS Family of Systems (FoS) 2023	2	2023	3	2023
DCGS-N Inc 2 FCR-5 Integrated Test	1	2023	2	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305220N *I (U)MQ-4C Triton*							
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	3,273.345	113.606	84.115	14.395	-	14.395	11.796	11.417	14.094	14.381	0.000	3,537.149
4020: *MQ-4C TRITON*	3,273.345	113.606	84.115	14.395	-	14.395	11.796	11.417	14.094	14.381	0.000	3,537.149
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 373												

Note

MQ-4C Triton RDTE funding for modernization was segregated into a new program element (from PE 0305220N to PE 0305421N) in order to satisfy Congressional direction for increased transparency.

A. Mission Description and Budget Item Justification

MQ-4C Triton Unmanned Air System (UAS). The popular name Triton was approved for the MQ-4C UAS in June 2012, designating the RQ-4 Broad Area Maritime Surveillance (BAMS) UAS as the MQ-4C Triton.

The MQ-4C Triton is a high altitude-long endurance UAS designed to provide Fleet and combatant commanders with persistent maritime Intelligence, Surveillance and Reconnaissance (ISR) of nearly all the world's high-density sea-lanes, littorals, and areas of national interest. Teamed with its manned-capability counterpart, the P-8A, Triton will be a key component of the Navy's family of systems to achieve maritime domain awareness. MQ-4C Triton will seek to leverage Maritime Patrol and Reconnaissance Force manpower, training and maintenance efficiencies.

The MQ-4C Triton features sensors designed to provide near worldwide coverage through a network of five orbits inside and outside continental United States, with sufficient air vehicles to remain airborne for 24 hours a day, 7 days a week, out to ranges of 2000 nautical miles. Onboard sensors will provide detection, classification, tracking and identification of maritime targets and include maritime radar, electro-optical/infra-red and Electronic Support Measures systems. Additionally, the MQ-4C will have a communications relay capability designed to link dispersed forces in the theater of operations and serve as a node in the Navy's networked strategy. Tactical-level data analysis will occur in real-time at shore-based mission control sites connected to the air vehicle via satellite communications. Further intelligence exploitation can be conducted at Fleet shore-based sites or aboard aircraft carriers and other ships.

The MQ-4C Triton UAS will implement phased capability upgrades within the ongoing acquisition program to pace capability with rapidly evolving technologies and threats to ensure the Navy maintains persistent ISR dominance through the system's lifecycle, and to support the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. System upgrades will include Multi-Intelligence capabilities, Counter Electronic Attack upgrades, a more robust electronic support capability and continue improvements to baseline mission system payloads.

The MQ-4C air vehicle, mission control system, specialized sensors, and communications suite will play a significant role in achieving the Navy's strategic vision for the 21st century. The Triton system as a persistence ISR enabler provides the supported combatant commander and fleet commander with unparalleled situational awareness of the maritime battle space to develop and sustain the common operational tactical picture. The system will also serve as a Fleet response plan enabler

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305220N *I (U)MQ-4C Triton*

with a persistent, global force offering to provide critical trip wire information for intelligence preparation of the environment. Triton will connect to both the Global Information Grid and the Distributed Common Ground System-Navy information backbone to provide the Warfighter with unprecedented levels of battlespace awareness to synchronize actions necessary to maintain maritime Full Spectrum Superiority.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	111.729	84.115	17.604	-	17.604
Current President's Budget	113.606	84.115	14.395	-	14.395
Total Adjustments	1.877	0.000	-3.209	-	-3.209
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.000	0.000			
• SBIR/STTR Transfer	-0.025	0.000			
• Program Adjustments	0.000	0.000	-3.035	-	-3.035
• Rate/Misc Adjustments	0.000	0.000	-0.174	-	-0.174
• Congressional General Reductions Adjustments	-0.098	-	-	-	-

Change Summary Explanation

Funding reduced by $3.000 million to align with updated phasing requirements for continuation of fatigue testing in support of Triton development.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0305220N / *(U)MQ-4C Triton*				Project (Number/Name) 4020 / *MQ-4C TRITON*			
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**
4020: *MQ-4C TRITON*	3,273.345	113.606	84.115	14.395	-	14.395	11.796	11.417	14.094	14.381	0.000	3,537.149
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 373

A. Mission Description and Budget Item Justification

MQ-4C Triton Unmanned Air System (UAS). The MQ-4C Triton is a high altitude-long endurance UAS designed to provide Fleet and combatant commanders with persistent maritime Intelligence, Surveillance and Reconnaissance (ISR) of nearly all the world's high-density sea-lanes, littorals, and areas of national interest. Teamed with its manned-capability counterpart, the P-8A, Triton will be a key component of the Navy's family of systems to achieve maritime domain awareness. MQ-4C Triton will seek to leverage Maritime Patrol and Reconnaissance Force manpower, training and maintenance efficiencies.

The MQ-4C Triton features sensors designed to provide near worldwide coverage through a network of five orbits inside and outside continental United States, with sufficient air vehicles to remain airborne for 24 hours a day, 7 days a week, out to ranges of 2000 nautical miles. Onboard sensors will provide detection, classification, tracking and identification of maritime targets and include maritime radar, electro-optical/infra-red and Electronic Support Measures systems. Additionally, the MQ-4C will have a communications relay capability designed to link dispersed forces in the theater of operations and serve as a node in the Navy's networked strategy. Tactical-level data analysis will occur in real-time at shore-based mission control sites connected to the air vehicle via satellite communications. Further intelligence exploitation can be conducted at Fleet shore-based sites or aboard aircraft carriers and other ships.

The MQ-4C Triton UAS will implement phased capability upgrades within the ongoing acquisition program to pace capability with rapidly evolving technologies and threats to ensure the Navy maintains persistent ISR dominance through the system's lifecycle, and to support the Maritime Intelligence, Surveillance, Reconnaissance and Targeting transition plan. System upgrades will include Multi-Intelligence capabilities, Counter Electronic Attack upgrades, a more robust electronic support capability and continue improvements to baseline mission system payloads.

The MQ-4C air vehicle, mission control system, specialized sensors, and communications suite will play a significant role in achieving the Navy's strategic vision for the 21st century. The Triton system as a persistence ISR enabler provides the supported combatant commander and fleet commander with unparalleled situational awareness of the maritime battle space to develop and sustain the common operational tactical picture. The system will also serve as a Fleet response plan enabler with a persistent, global force offering to provide critical trip wire information for intelligence preparation of the environment. Triton will connect to both the Global Information Grid and the Distributed Common Ground System-Navy information backbone to provide the Warfighter with unprecedented levels of battlespace awareness to synchronize actions necessary to maintain maritime Full Spectrum Superiority.

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	90.098	73.568	13.699	0.000	13.699
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305220N / *(U)MQ-4C Triton*	**Project (Number/Name)** 4020 / *MQ-4C TRITON*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Awarded contract in FY08 to initiate the MQ-4C Triton System Development and Demonstration phase effort. The Prime Contractor is responsible for overall system development and performance, as well as associated management, engineering and logistics activities. ***FY 2018 Plans:*** Continue SDD and delivery of two SDTA vehicles. Funding decreases from FY17 to reflect a ramp down in baseline MQ-4C Triton SDD development efforts in accordance with the program schedule. ***FY 2019 Base Plans:*** Continue SDD. Funding decreases from FY18 to reflect a ramp down in baseline MQ-4C Triton SDD development efforts which transition to Triton's Multi-INT capability. Effort within this PE continues on airframe fatigue testing and analysis. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $59.869 million from FY18 to FY19 reflects a completion in baseline MQ-4C Triton SDD development efforts.					
Title: ILS, Support, Studies & Analysis	0.725	0.325	0.305	0.000	0.305
Articles:	-	-	-	-	-
Description: Integrated Logistics Support, Studies and Analysis. ***FY 2018 Plans:*** Continue integrated logistics support, technical engineering services, sensor risk reduction, logistics supportability analyses and environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton UAS capabilities. ***FY 2019 Base Plans:*** Continue integrated logistics support, logistics supportability analyses and environmental planning, and development of technical data to support fielding of the MQ-4C Triton UAS capabilities. ***FY 2019 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305220N / *(U)MQ-4C Triton*	**Project (Number/Name)** 4020 / *MQ-4C TRITON*

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 $0.020 million from FY18 to FY19 reflects a completion in baseline MQ-4C Triton SDD development efforts.					
Title: Test & Evaluation (T&E) ***Articles:*** ***Description:*** T&E efforts. ***FY 2018 Plans:*** Continue DT and OT support activities to allow test and fielding of the MQ-4C Triton UAS in accordance with the program schedule. ***FY 2019 Base Plans:*** Developmental test support of MQ-4C Triton fatigue testing. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $9.811 million from FY18 to FY19 reflects a completion in baseline MQ-4C Triton SDD development efforts.	22.676 -	10.184 -	0.373 -	0.000 -	0.373 -
Title: Program Management (PM) ***Articles:*** ***Description:*** PM support and travel. ***FY 2018 Plans:*** Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning, technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international	0.107 -	0.038 -	0.018 -	0.000 -	0.018 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305220N / *(U)MQ-4C Triton*	**Project (Number/Name)** 4020 / *MQ-4C TRITON*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
cooperation efforts. ***FY 2019 Base Plans:*** Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning, technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international cooperation efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.020 million from FY18 to FY19 reflects a completion in baseline MQ-4C Triton SDD development efforts.					
Accomplishments/Planned Programs Subtotals	113.606	84.115	14.395	0.000	14.395

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/0442: *MQ-4 Triton*	499.894	579.392	627.265	-	627.265	571.971	605.997	604.330	758.923	5,975.539	10,797.450
• MILCON/0212176N: *Facilities New Footprint - Fleet Ops*	30.475	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	88.385
• APN/0605: *Spares and Repair Parts*	95.851	56.915	37.403	-	37.403	36.420	6.430	0.000	0.000	0.000	336.973
• RDT&E/0305421N: *(U)RQ-4 Modernization*	144.477	229.404	219.894	-	219.894	136.526	98.684	80.594	72.113	83.826	1,215.410
• MILCON/0815976N: *Facilities New Footprint - Training*	41.380	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	79.411
• APN/0596: *MQ-4 Series*	0.000	39.996	48.278	-	48.278	7.793	0.000	0.000	0.000	0.000	96.067
• OMN/1D4D: *Weapons Maintenance*	0.000	11.310	16.519	-	16.519	24.003	37.795	46.332	47.315	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305220N / *(U)MQ-4C Triton*	**Project (Number/Name)** 4020 / *MQ-4C TRITON*

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
• MILCON/0305220N: *Triton FOB 3rd Fleet*	0.000	0.000	0.000	-	0.000	0.000	55.809	0.000	0.000	0.000	55.809

Remarks

D. Acquisition Strategy

The MQ-4C Triton acquisition approach supports the Navy's Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) Transition Plan by providing a stable and effective baseline early operational capability in FY18 to facilitate Fleet introduction and learning while continuing System Development and Demonstration engineering and integrated test on Signals Intelligence (SIGINT) and other upgrades to deliver a Multi-INT configuration at Initial Operational Capability (IOC). Phased capability upgrades will continue post IOC to enable the MQ-4C Triton to keep pace with rapidly evolving technologies and threats, and address correction of deficiencies and obsolescence issues to ensure the Navy maintains persistent Intelligence, Surveillance and Reconnaissance dominance through the system's lifecycle.

E. Performance Metrics

Successfully achieve Integrated Test, Operational Evaluation and Early Operational Capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305220N / *(U)MQ-4C Triton*	**Project (Number/Name)** 4020 / *MQ-4C TRITON*

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/CPIF	Northrop Grumman : Rancho Bernardo, CA	2,672.898	85.788	Nov 2016	71.558	Nov 2017	12.263	Nov 2018	-		12.263	46.485	2,888.992	2,888.992
Systems Engineering	Various	Various : Various	19.021	0.010	Nov 2016	0.010	Nov 2017	0.000		-		0.000	0.000	19.041	-
Systems Engineering	WR	NAWC-AD : Patuxent River, MD	234.345	4.300	Nov 2016	2.000	Nov 2017	1.436	Nov 2018	-		1.436	3.623	245.704	-
Systems Engineering	WR	NAWC-WD : China Lake, CA	13.418	0.000	Nov 2016	0.000	Nov 2017	0.000		-		0.000	0.000	13.418	-
Contractor Engineering	C/CPFF	Mitre : Mclean, VA	4.044	0.000	Nov 2016	0.000		0.000		-		0.000	0.000	4.044	4.044
Prior Year Prod Dev no longer in the FYDP	Various	Various : Various	24.553	0.000		0.000		0.000		-		0.000	0.000	24.553	-
		Subtotal	2,968.279	90.098		73.568		13.699		-		13.699	50.108	3,195.752	N/A

Remarks

The Primary Hardware Development line resources Northrop Grumman for prime contractor activities, which include System Development and Demonstration (SDD) and System Demonstration Test Article (SDTA) vehicles and Fatigue 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	Various	Various : Various	21.552	0.000	Nov 2016	0.000	Nov 2017	0.000		-		0.000	0.000	21.552	-
Integrated Logistics Support	Various	Various : Various	21.275	0.025	Nov 2016	0.025	Nov 2017	0.005	Nov 2018	-		0.005	0.020	21.350	-
Integrated Logistics Support	WR	NAWC-AD : Patuxent River, MD	53.659	0.700	Nov 2016	0.300	Nov 2017	0.300	Nov 2018	-		0.300	1.200	56.159	-
Prior year cost no longer funded in the FYDP	Various	Various : Various	10.784	0.000		0.000		0.000		-		0.000	0.000	10.784	-
		Subtotal	107.270	0.725		0.325		0.305		-		0.305	1.220	109.845	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305220N / *(U)MQ-4C Triton*	Project (Number/Name) 4020 / *MQ-4C TRITON*	

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	18.258	1.417	Nov 2016	0.695	Nov 2017	0.000		-		0.000	0.000	20.370	-
Developmental Test & Evaluation	WR	NAWC-AD : Patuxent River, MD	131.343	19.000	Nov 2016	8.140	Nov 2017	0.373	Nov 2018	-		0.373	0.291	159.147	-
Operational Test & Evaluation	Various	Various : Various	2.132	1.001	Nov 2016	1.000	Nov 2017	0.000		-		0.000	0.000	4.133	-
Developmental Test & Evaluation (SATCOMM)	MIPR	DITCO : Various	9.577	1.258	Nov 2016	0.349	Nov 2017	0.000	Nov 2018	-		0.000	0.000	11.184	-
		Subtotal	161.310	22.676		10.184		0.373		-		0.373	0.291	194.834	N/A

Management Services ($ in Millions)

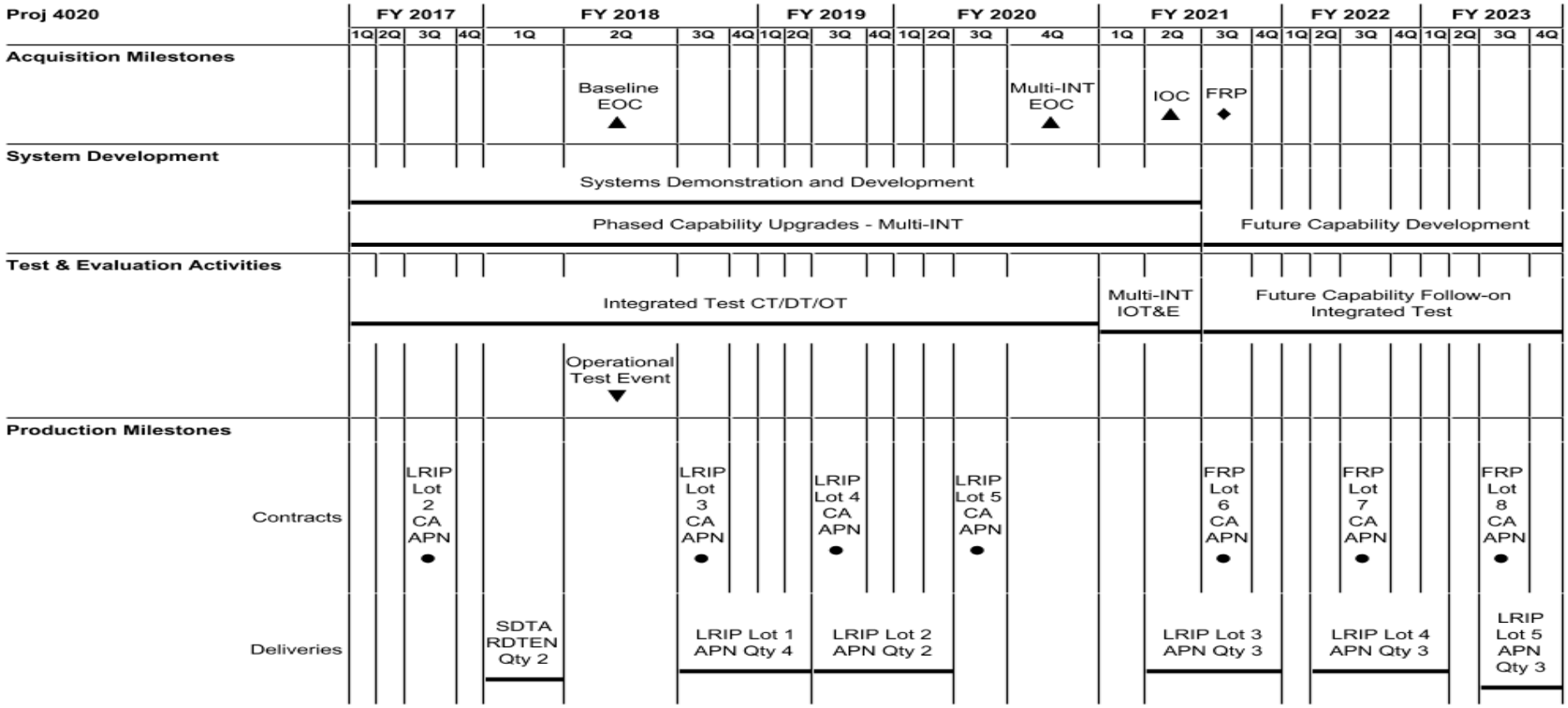
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Various : Various	3.507	0.000	Nov 2016	0.000	Nov 2017	0.000		-		0.000	0.000	3.507	-
Travel	Allot	Various : Various	1.647	0.107	Nov 2016	0.038	Nov 2017	0.018	Nov 2018	-		0.018	0.069	1.879	-
Program Management Support	C/CPFF	Ausley : Lexington Park, MD	26.324	0.000	Nov 2016	0.000	Nov 2017	0.000		-		0.000	0.000	26.324	26.324
Prior year cost no longer funded in the FYDP	Various	Various : Various	5.008	0.000		0.000		0.000		-		0.000	0.000	5.008	-
		Subtotal	36.486	0.107		0.038		0.018		-		0.018	0.069	36.718	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	3,273.345	113.606		84.115		14.395		-		14.395	51.688	3,537.149	N/A

Remarks

Prior to FY10, MQ-4C Triton, formerly known as RQ-4 Broad Area Maritime Surveillance (BAMS), was budgeted for in PE 0305205N: Endurance Unmanned Aer Veh.

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305220N / *(U)MQ-4C Triton*	**Project (Number/Name)** 4020 / *MQ-4C TRITON*



2019PB - 0305220N - 4020 MQ-4C Triton development activities are resourced by PE 0305220N and PE 0305421N.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305220N / *(U)MQ-4C Triton*	**Project (Number/Name)** 4020 / *MQ-4C TRITON*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 4020				
Acquisition Milestones: Full Rate Production	3	2021	3	2021
Acquisition Milestones: Initial Operational Capability	2	2021	2	2021
Acquisition Milestones: Multi-INT Early Operational Capability	4	2020	4	2020
Acquisition Milestones: Baseline Early Operational Capability	2	2018	2	2018
System Development: System Development and Demonstration	1	2017	2	2021
System Development: Phased Capability Upgrades - Multi-INT	1	2017	2	2021
System Development: Future Capability Development	3	2021	4	2023
Test & Evaluation Activities: Integrated Test (Combined/Developmental/Operational)	1	2017	4	2020
Test & Evaluation Activities: Multi-INT Initial Operational Test and Evaluation	1	2021	2	2021
Test & Evaluation Activities: Future Capabilities Follow-on Integrated Test	3	2021	4	2023
Test & Evaluation Activities: Operational Test Event	2	2018	2	2018
Production Milestones: Contracts: Low Rate Initial Production Lot 2 Contract Award	3	2017	3	2017
Production Milestones: Contracts: Low Rate Initial Production Lot 3 Contract Award	3	2018	3	2018
Production Milestones: Contracts: Low Rate Initial Production Lot 4 Contract Award	3	2019	3	2019
Production Milestones: Contracts: Low Rate Initial Production Lot 5 Contract Award	3	2020	3	2020
Production Milestones: Contracts: Full Rate Production Lot 6 Contract Award	3	2021	3	2021
Production Milestones: Contracts: Full Rate Production Lot 7 Contract Award	3	2022	3	2022
Production Milestones: Contracts: Full Rate Production Lot 8 Contract Award	3	2023	3	2023
Production Milestones: Deliveries: System Demonstration Test Articles Delivery	1	2018	1	2018
Production Milestones: Deliveries: Low Rate Initial Production Lot 1 Delivery	3	2018	2	2019
Production Milestones: Deliveries: Low Rate Initial Production Lot 2 Delivery	3	2019	2	2020
Production Milestones: Deliveries: Low Rate Initial Production Lot 3 Delivery	2	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305220N / *(U)MQ-4C Triton*	**Project (Number/Name)** 4020 / *MQ-4C TRITON*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Deliveries: Low Rate Initial Production Lot 4 Delivery	2	2022	1	2023
Production Milestones: Deliveries: Low Rate Initial Production Lot 5 Delivery	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305231N *I MQ-8 UAV*							
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	464.015	26.518	62.656	9.843	-	9.843	17.687	9.580	7.404	7.842	146.213	751.758
2768: *MQ-8 Fire Scout*	464.015	26.518	62.656	9.843	-	9.843	17.687	9.580	7.404	7.842	146.213	751.758
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 253												

A. Mission Description and Budget Item Justification

Note: This budget prioritizes system wholeness to ensure program of record capabilities are fully integrated and support fleet requirements. System wholeness supports completion of MQ-8C operational test requirements, development of radar, and component redesign required to maintain system hardware.

The MQ-8 Unmanned Air System is a Joint Military Intelligence Program.

The MQ-8 Unmanned Air System is popularly known as "Fire Scout". The program achieved MS C in June 2017. The program includes MQ-8B air vehicles, MQ-8C air vehicles, and associated Mission Control Systems (MCS), Unmanned Aerial Vehicle Common Automatic Recovery Systems (UCARS) and support equipment. In addition to the air vehicles, Radar and Weapons capabilities were developed under the Navy's Rapid Deployment Capability (RDC) authorities. All acquisition actions previously planned under the RDCs have transitioned into the POR. Current analysis has determined that a total procurement of 63 air vehicles (54 procurement and 9 RDT&EN / 30 MQ-8Bs and 33 MQ-8Cs) will satisfy current and foreseeable operational needs.

The MQ-8 System provides real-time and non-real-time Intelligence, Surveillance and Reconnaissance (ISR) data to tactical users without the use of manned aircraft or reliance on limited joint theater or national assets. The baseline MQ-8 can accomplish missions including over-the-horizon tactical reconnaissance, classification, targeting and laser designation and battle damage assessment (including voice communications relay). Development efforts respond to emerging fleet requirements through integration and improvements to Common Operational Picture capabilities, avionics, payloads, range, endurance, and targeting.

The MQ-8 launches and recovers vertically, and can operate from suitably-equipped air capable ships, as well as confined area land bases. Interoperability is achieved through the use of the Tactical Control System (TCS) software in the MCS, also referred to as a Ground Control Station (GCS), and through the use of the Tactical Common Data Link (TCDL). The data from the MQ-8 is provided through standard DoD Command, Control, Communications, Computers and ISR (C4ISR) system architectures and protocols.

A deployed MQ-8 system includes air vehicle(s), payloads (i.e. electro-optical/infrared/laser designator-range finder, Automated Identification System, voice communications relay, Radar, Weapons, and other specialty payloads), MCS (with TCS and TCDL integrated for interoperability), a UCARS for automatic launch and recovery, and associated spares and support equipment. The schedules for MCS and UCARS components are based on host ship requirements, while schedules for air vehicle components, support equipment, and training equipment are based on operational deployment plans. A limited number of land-based mission control systems supplement the shipboard systems to support shore-based operations, such as pre-deployment or acceptance functional check flights. These land-based mission control

stations will also support depot-level maintenance/post-maintenance activities. The MQ-8C provides additional mission endurance and payload-weight-power, increased reliability, and improved maintainability to the MQ-8 Fire Scout System. MQ-8 systems will support missions on Littoral Combat Ship (LCS), Expeditionary Mobile Base (T-ESB), FFG(X), and/or suitably-equipped air capable ships. Quantities of air vehicles are derived from LCS and/or suitably-equipped air capable ship deployment requirements for Surface Warfare and Mine Countermeasures mission sets.

The MQ-8 Radar capability is the initial effort as part of the Surface Warfare (SUW) Increment of the MQ-8C. A non-developmental maritime Radar has been competitively selected for integration into the MQ-8C Fire Scout System. This system will provide the MQ-8 operators and the supported LCS crew enhanced situational awareness of the Recognized Maritime Picture (RMP) by providing multiple operational modes to include surface search, track, Inverse Synthetic Aperture Radar (ISAR) maritime target classification, and Synthetic Aperture Radar (SAR) target classification capabilities. The maritime Radar will be fully integrated with the Mission Control Systems (MCS) and ship's combat systems providing data in standardized format for ease of dissemination to other users.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	26.518	62.656	19.952	-	19.952
Current President's Budget	26.518	62.656	9.843	-	9.843
Total Adjustments	0.000	0.000	-10.109	-	-10.109
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-9.987	-	-9.987
• Rate/Misc Adjustments	0.000	0.000	-0.122	-	-0.122

Change Summary Explanation

The FY 2019 funding request was reduced by $0.229 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 2019 funding request was reduced by $5.558 million to account for the availability of prior year execution balances.

Technical: FY19 funding decrease reflects the deferral of significant MQ-8C weapons development efforts to the end of the FYDP. Remaining FYDP funding supports completion of Radar development, MQ-8C and Radar test requirements, and continued weapons studies. Radar and weapons funding supports requirements outlined in the MQ-8C Capabilities Production Document (CPD). Test funding supports DT and OT events to meet IOC, and deployment dates. Future payload efforts will be considered when developing current efforts.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305231N *I MQ-8 UAV*

Schedule:
Updated Milestone C decision and other milestones to align to the restructured MQ-8 program.
Updated Radar capability contract awards, payloads efforts, and reviews to align to the restructured MQ-8 program.
Updated production and delivery schedules for the current production plan.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305231N / *MQ-8 UAV*	Project (Number/Name) 2768 / *MQ-8 Fire Scout*	

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
2768: *MQ-8 Fire Scout*	464.015	26.518	62.656	9.843	-	9.843	17.687	9.580	7.404	7.842	146.213	751.758
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 253

A. Mission Description and Budget Item Justification

This budget prioritizes system wholeness to ensure program of record capabilities are fully integrated and support fleet requirements. System wholeness supports completion of MQ-8C operational test requirements, development of radar, and component redesign required to maintain system hardware.

The MQ-8 Unmanned Air System is popularly known as "Fire Scout". The program achieved MS C in June 2017. The program includes MQ-8B air vehicles, MQ-8C air vehicles, and associated Mission Control Systems (MCS), Unmanned Aerial Vehicle Common Automatic Recovery Systems (UCARS) and support equipment. In addition to the air vehicles, Radar and Weapons capabilities were developed under the Navy's Rapid Deployment Capability (RDC) authorities. All acquisition actions previously planned under the RDCs have transitioned into the POR. FY16 analysis has determined that a total fleet requirement of 60 air vehicles (51 procurement and 9 RDT&EN / 30 MQ-8Bs and 30 MQ-8Cs) will satisfy current Fleet needs.

The MQ-8 System provides real-time and non-real-time Intelligence, Surveillance and Reconnaissance (ISR) data to tactical users without the use of manned aircraft or reliance on limited joint theater or national assets. The baseline MQ-8 can accomplish missions including over-the-horizon tactical reconnaissance, classification, targeting and laser designation and battle damage assessment (including voice communications relay). Development efforts respond to emerging fleet requirements through integration and improvements to Common Operational Picture capabilities, avionics, payloads, range, endurance, and targeting.

The MQ-8 launches and recovers vertically, and can operate from suitably-equipped air capable ships, as well as confined area land bases. Interoperability is achieved through the use of the Tactical Control System (TCS) software in the MCS, also referred to as a Ground Control Station (GCS), and through the use of the Tactical Common Data Link (TCDL). The data from the MQ-8 is provided through standard DoD Command, Control, Communications, Computers and ISR (C4ISR) system architectures and protocols.

A deployed MQ-8 system includes air vehicle(s), payloads (i.e. electro-optical/infrared/laser designator-range finder, Automated Identification System, voice communications relay, Radar, Weapons, and other specialty payloads), MCS (with TCS and TCDL integrated for interoperability), a UCARS for automatic launch and recovery, and associated spares and support equipment. The schedules for MCS and UCARS components are based on host ship requirements, while schedules for air vehicle components, support equipment, and training equipment are based on operational deployment plans. A limited number of land-based mission control systems supplement the shipboard systems to support shore-based operations, such as pre-deployment or acceptance functional check flights. These land-based mission control stations will also support depot-level maintenance/post-maintenance activities. The MQ-8C provides additional mission endurance and payload-weight-power, increased reliability, and improved maintainability to the MQ-8 Fire Scout System. MQ-8 systems will support missions on Littoral Combat Ship (LCS), Expeditionary Mobile Base (T-ESB), FFG(X), and/or suitably-equipped air capable ships. Quantities of air vehicles are derived from LCS and/or suitably-equipped air capable ship deployment requirements for Surface Warfare and Mine Countermeasures mission sets.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305231N / *MQ-8 UAV*	**Project (Number/Name)** 2768 / *MQ-8 Fire Scout*

The MQ-8 Radar capability is the initial effort as part of the Surface Warfare (SUW) Increment of the MQ-8C. A non-developmental maritime Radar has been competitively selected for integration into the MQ-8C Fire Scout System. This system will provide the MQ-8 operators and the supported LCS crew enhanced situational awareness of the Recognized Maritime Picture (RMP) by providing multiple operational modes to include surface search, track, Inverse Synthetic Aperture Radar (ISAR) maritime target classification, and Synthetic Aperture Radar (SAR) target classification capabilities. The maritime Radar will be fully integrated with the Mission Control Systems (MCS) and ship's combat systems providing data in standardized format for ease of dissemination to other users.

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 System Development	9.429	31.375	1.193	0.000	1.193
Articles:	-	-	-	-	-
FY 2018 Plans: Continue MQ-8C hardware, software modifications, other payload integration, cyber vulnerability closure and safety capability improvements such a backup landing system and collision avoidance systems. Continue MQ-8 integration and testing on LCS. Continue integration of the selected Radar with the MQ-8C Air Vehicle and MCS. Complete qualification of the selected Radar for the MQ-8C operational environment. Complete System Integration Lab testing of the software build for the maritime Radar integration. Continue MQ-8 FOT&E					
FY 2019 Base Plans: Continue MQ-8C hardware, software modifications, other payload integration, cyber vulnerability closure and safety capability improvements such a backup landing system and collision avoidance systems. Continue MQ-8 integration and testing on LCS. Continue integration of the selected Radar with the MQ-8C Air Vehicle and MCS. Complete qualification of the selected Radar for the MQ-8C operational environment. Complete System Integration Lab testing of the software build for the maritime Radar integration. Continue MQ-8 FOT&E.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease results from deferral of MQ-8C weapons capability development to the end of the FYDP.					
Title: Development/Operational Testing	7.966	19.616	5.268	0.000	5.268
Articles:	-	-	-	-	-
FY 2018 Plans: Complete Dynamic Interface testing of MQ-8C on both classes of LCS. Continue MQ-8C developmental testing of hardware and software modifications and planning for the other payload integration. Complete Operational Test and Evaluation testing of MQ-8C on LCS. Continue developmental Testing of the maritime Radar on the					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305231N / *MQ-8 UAV*	**Project (Number/Name)** 2768 / *MQ-8 Fire Scout*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
MQ-8C Air Vehicle. Complete transition of the test team from contractor to government. Complete MQ-8C IOT&E and continue MQ-8 FOT&E. ***FY 2019 Base Plans:*** Continue Dynamic Interface testing of MQ-8C on both classes of Littoral Combat Ship (LCS). Continue MQ-8C developmental testing of hardware and software modifications and planning for the other payload integration. Continue developmental Testing of the maritime Radar on the MQ-8C Air Vehicle. Continue MQ-8 FOT&E. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease results from reduced resource requirements to support MQ-8C IOC efforts and radar development.					
Title: Engineering and Technical Services	9.123	11.665	3.382	0.000	3.382
Articles:	-	-	-	-	-
FY 2018 Plans: Continue engineering, program technical management, logistics support of the MQ-8C. Continue acquisition planning and execution to transition the Radar, and Weapons capabilities. Continue Radar, Weapons, other payloads, LCS integration, and system studies and design. Continue MQ-8 FOT&E. ***FY 2019 Base Plans:*** Continue engineering, program technical management, logistics support of the MQ-8C. Continue acquisition planning and execution to transition the Radar and Weapons capabilities. Continue Radar, Weapons, other payloads, LCS integration, and system studies and design. Continue MQ-8 FOT&E. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease results from reduced engineering, management, and support requirements for current development efforts.					
Accomplishments/Planned Programs Subtotals	26.518	62.656	9.843	0.000	9.843

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305231N / *MQ-8 UAV*	**Project (Number/Name)** 2768 / *MQ-8 Fire Scout*

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, 044300: *MQ-8 UAV*	113.635	49.472	54.761	-	54.761	45.015	40.587	59.409	40.702	78.089	1,449.371
• APN, 060510: *MQ-8 UAV Spares*	0.000	3.499	0.000	-	0.000	0.519	0.188	0.136	0.143	15.939	132.352
• APN, 058800: *MQ-8 Series*	19.003	32.361	37.907	-	37.907	35.504	43.529	31.830	28.787	72.993	328.625

Remarks

D. Acquisition Strategy

The Navy's acquisition strategy capitalizes on prior Rapid Deployment Capability efforts, while leveraging existing program investments. The acquisition strategy maintains commonality of MQ-8B and MQ-8C systems, payloads, avionics, software, and ancillary equipment where possible. The acquisition strategy supports the revised Capability Production Document. Initial Operational Capability of an MQ-8B-based system was achieved in 2QFY14 while IOC of an MQ-8C-based system onboard Littoral Combat Ship is anticipated in 4QFY18. The maritime Radar has been competitively selected. The integration effort will require sole source contracts to the current prime Original Equipment Manufacturers for the Tactical Control System and the MQ-8 Fire Scout air vehicle.

E. Performance Metrics

Successfully provide an MQ-8C air vehicle that supports operational deployments. Successfully provide a Radar capability for operational deployments. Successfully achieve Littoral Combat Ship integration.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305231N / *MQ-8 UAV*	Project (Number/Name) 2768 / *MQ-8 Fire Scout*	

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 (MQ-8)	C/CPIF	Northrop Grumman Corp : San Diego, CA	338.125	7.579	Nov 2016	28.838	Nov 2017	0.392	Nov 2018	-		0.392	80.193	455.127	455.127
Primary Hardware Development (MQ-8)	C/CPIF	Raytheon Corp : Falls Church, VA	24.251	0.000		2.537	Nov 2017	0.801	Nov 2018	-		0.801	11.368	38.957	38.957
Primary Hardware Development (RADAR OEM)	C/CPIF	Leonardo MW : Edinburgh, United Kingdom	10.821	0.000		0.000		0.000		-		0.000	0.000	10.821	10.821
Primary Hardware Development (Minotaur)	C/BA	John Hopkins University : Laurel, MD	0.000	1.850	May 2017	0.000		0.000		-		0.000	0.000	1.850	1.850
		Subtotal	373.197	9.429		31.375		1.193		-		1.193	91.561	506.755	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	Various	Various : Various	3.051	0.000		1.819	Nov 2017	0.385	Nov 2018	-		0.385	5.374	10.629	-
		Subtotal	3.051	0.000		1.819		0.385		-		0.385	5.374	10.629	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 : PAXRV, MD	10.235	6.040	Nov 2016	12.569	Nov 2017	4.484	Nov 2018	-		4.484	27.017	60.345	-
Operational Test & Evaluation/QRA	WR	NAWCWD : CHINALK, CA	9.776	0.658	Mar 2017	7.047	Nov 2017	0.784	Nov 2018	-		0.784	20.819	39.084	-
Prior Years T&E no longer funded in the FYDP	Various	Various : Various	0.378	1.268	Nov 2016	0.000		0.000		-		0.000	0.000	1.646	-
		Subtotal	20.389	7.966		19.616		5.268		-		5.268	47.836	101.075	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305231N / *MQ-8 UAV*	Project (Number/Name) 2768 / *MQ-8 Fire Scout*	

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 : PAXRV, MD	48.537	6.400	Nov 2016	7.116	Nov 2017	2.000	Nov 2018	-		2.000	28.515	92.568	-
Program Management Support	Various	Various : Various	14.972	2.448	Nov 2016	2.405	Nov 2017	0.712	Nov 2018	-		0.712	12.636	33.173	-
Travel	WR	NAVAIR : PAXRV, MD	1.412	0.275	Nov 2016	0.325	Nov 2017	0.285	Nov 2018	-		0.285	2.804	5.101	-
Prior years Mgmt Svcs no longer funded in the FYDP	Various	Various : Various	2.457	0.000		0.000		0.000		-		0.000	0.000	2.457	-
		Subtotal	67.378	9.123		9.846		2.997		-		2.997	43.955	133.299	N/A

Remarks

Travel contract type is TO.

	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	464.015	26.518		62.656		9.843		-		9.843	188.726	751.758	N/A

Remarks

OT&E includes MQ-8C FOT&E

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305231N / *MQ-8 UAV*	**Project (Number/Name)** 2768 / *MQ-8 Fire Scout*

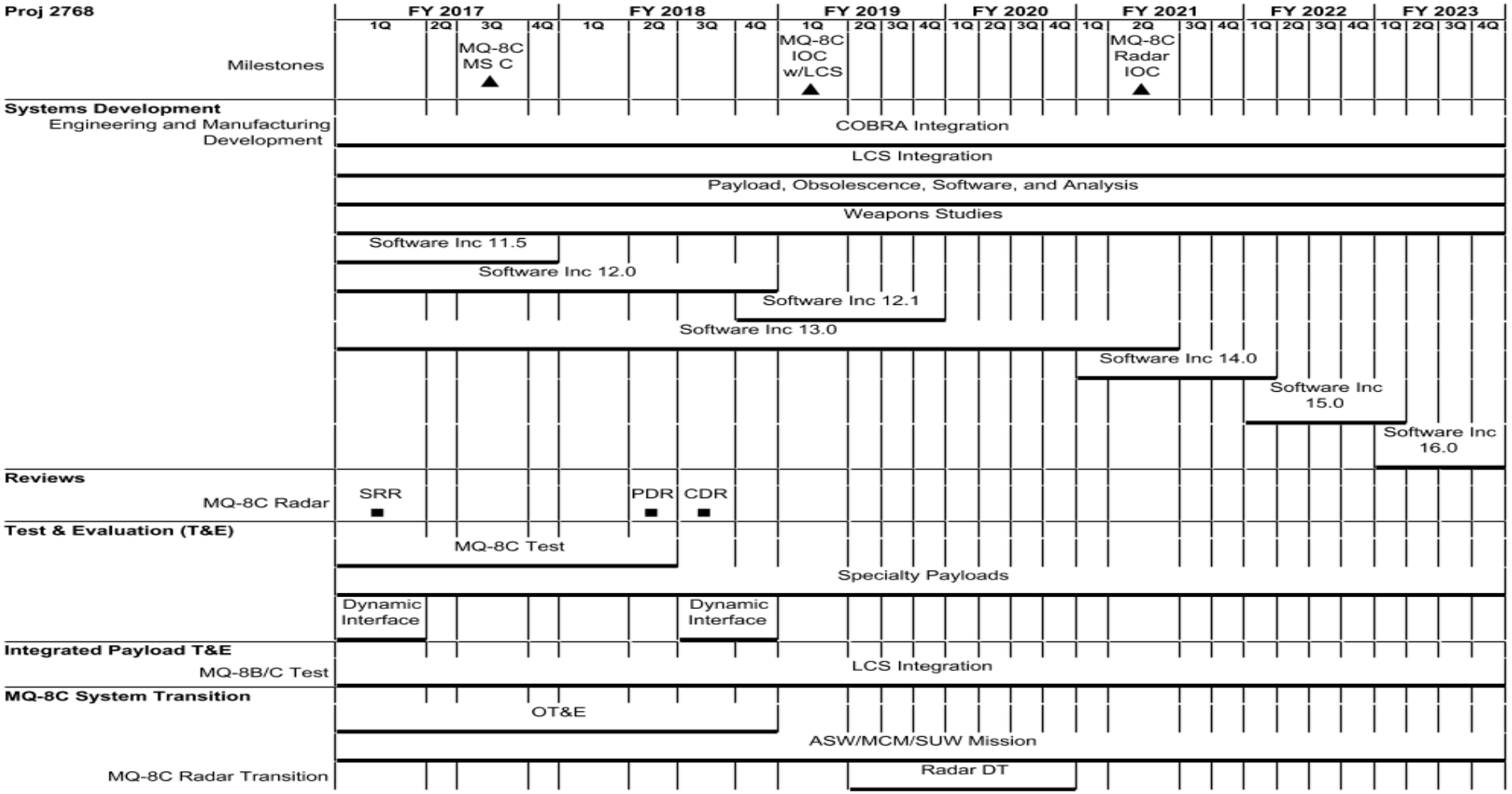
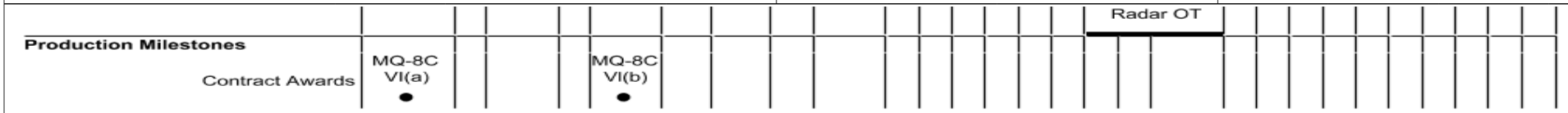


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305231N / *MQ-8 UAV*	**Project (Number/Name)** 2768 / *MQ-8 Fire Scout*



2019PB - 0305231N - 2768

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305231N / *MQ-8 UAV*	**Project (Number/Name)** 2768 / *MQ-8 Fire Scout*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2768				
Milestones: MQ-8 Initial Operational Capability (IOC) - MQ-8C Littoral Combat Ship (LCS)	1	2019	1	2019
Milestones: MQ-8C Milestone C Decision	3	2017	3	2017
Milestones: MQ-8C Radar IOC	2	2021	2	2021
Systems Development: Engineering and Manufacturing Development: Coastal Battlefield Reconnaissance and Analysis Integration (COBRA), BLK 1/2/3	1	2017	4	2023
Systems Development: Engineering and Manufacturing Development: Littoral Combat Ship (LCS) Integration	1	2017	4	2023
Systems Development: Engineering and Manufacturing Development: Payload, Obsolescence, Software, and Analysis	1	2017	4	2023
Systems Development: Engineering and Manufacturing Development: Weapons Studies	1	2017	4	2023
Systems Development: Engineering and Manufacturing Development: Software Increment 11.5	1	2017	4	2017
Systems Development: Engineering and Manufacturing Development: Software Increment 12.0	1	2017	4	2018
Systems Development: Engineering and Manufacturing Development: Software Increment 12.1	4	2018	4	2019
Systems Development: Engineering and Manufacturing Development: Software Increment 13.0	1	2017	2	2021
Systems Development: Engineering and Manufacturing Development: Software Increment 14.0	1	2021	1	2022
Systems Development: Engineering and Manufacturing Development: Software Increment 15.0	1	2022	1	2023

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305231N / *MQ-8 UAV*	**Project (Number/Name)** 2768 / *MQ-8 Fire Scout*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Systems Development: Engineering and Manufacturing Development: Software Increment 16.0	1	2023	4	2023
Reviews: MQ-8C Radar: System Requirements Review (SRR)	1	2017	1	2017
Reviews: MQ-8C Radar: Preliminary Design Review (PDR)	2	2018	2	2018
Reviews: MQ-8C Radar: Critical Design Review (CDR)	3	2018	3	2018
Test & Evaluation (T&E): MQ-8C Development Test	1	2017	2	2018
Test & Evaluation (T&E): Specialty Payloads	1	2017	4	2023
Test & Evaluation (T&E): MQ-8C Dynamic Interface (DI) Testing LCS Even Class	1	2017	1	2017
Test & Evaluation (T&E): MQ-8C Dynamic Interface (DI) Testing LCS Odd Class	3	2018	4	2018
Integrated Payload T&E: MQ-8B/C Test: Littoral Combat Ship (LCS) Integration	1	2017	4	2023
MQ-8C System Transition: Operational Test and Evaluation (OT&E)	1	2017	4	2018
MQ-8C System Transition: ASW/MCM/SUW Mission	1	2017	4	2023
MQ-8C System Transition: MQ-8C Radar Transition: Radar Developmental Test (DT)	2	2019	4	2020
MQ-8C System Transition: MQ-8C Radar Transition: Radar Operational Test (OT)	4	2020	2	2021
Production Milestones: Contract Awards: Air Vehicles MQ-8C VI(a)	1	2017	1	2017
Production Milestones: Contract Awards: Air Vehicles MQ-8C VI(b)	1	2018	1	2018

THIS PAGE INTENTIONALLY LEFT BLANK

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305232M / *RQ-11 UAV*							
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	3.442	0.000	2.022	0.524	-	0.524	0.509	0.522	0.536	0.558	Continuing	Continuing
2292: *Unmanned Air Systems (Intel)*	3.442	0.000	2.022	0.524	-	0.524	0.509	0.522	0.536	0.558	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Small Unit Remote Scouting System (SURSS) - The SURSS program procures unmanned aircraft systems (UAS) to provide battalion/company/detachment level units with scalable airborne reconnaissance and surveillance capabilities to aid in detecting, identifying, engaging, or avoiding enemy units. Multiple systems, to include RQ-12 Wasp, RQ-11 Raven, RQ-20 Puma and various Nano/VTOL UAS's are required to meet various operational requirements delineated in the Operational Requirements Document. The SURSS program also conducts Field User Evaluations (FUEs) to support Universal Urgent Needs Statements (UUNS) that inform future USMC system procurement and ensure Marines have the most current technology available.

Development efforts for SURSS are ongoing in order to keep Group I-II UAS capability in line with emerging technologies and threats. SURSS is developing a Single Operator Man-Portable Ground Control System (SOMGCS) to improve portability and digital interoperability. Mobile ad-hoc network (MANET) communication relay, laser marker, and Signals Intelligence payloads integration are being developed to improve effectiveness and interoperability to better support the warfighter. Improvements such as solar technology, improved batteries, software upgrades, and alternative repair components are being explored to improve effectiveness, reliability, and reduce support costs.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.418	2.022	0.535	-	0.535
Current President's Budget	0.000	2.022	0.524	-	0.524
Total Adjustments	-0.418	0.000	-0.011	-	-0.011
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.011	-	-0.011
• Congressional Directed Reductions Adjustments	-0.418	-	-	-	-

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305232M *I RQ-11 UAV*

Change Summary Explanation

Program Element change to Small UAS formally known as RQ-11 as the budget docs pertains to the entire PoR family of systems.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305232M / *RQ-11 UAV*	Project (Number/Name) 2292 / *Unmanned Air Systems (Intel)*	

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
2292: *Unmanned Air Systems (Intel)*	3.442	0.000	2.022	0.524	-	0.524	0.509	0.522	0.536	0.558	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Small Unit Remote Scouting System (SURSS) - The SURSS program procures unmanned aircraft systems (UAS) to provide battalion/company/detachment level units with scalable airborne reconnaissance and surveillance to aid in detecting, identifying, engaging, or avoiding enemy units. Multiple systems, to include RQ-12 Wasp, RQ-11 Raven, RQ-20 Puma and various Nano/VTOL UAS's are required to meet various operational requirements delineated in the Operational Requirements Document. The SURSS program also conducts Field User Evaluations (FUEs) to support Universal Urgent Needs Statements (UUNS) that inform future USMC system procurement and ensure Marines have the most current technology available.

RQ-12 Wasp (Block 0) - Wasp is a small, all environment UAS with a wingspan of 3.3 feet weight of 2.25 pounds and endurance of 60 minutes. The payload consists of a gimbaled turret with Electro Optical/Infrared (EO/IR) sensor. It allows maximum portability and provides near real time reconnaissance required by the platoon and rifle squad which reduces the Intelligence, Surveillance, and Reconnaissance (ISR) request-to-response timeframe and eliminates delays or denials for coverage due to an imbalance of unmanned air systems to requests. Wasp is used for remote reconnaissance and surveillance, force protection, convoy security, target acquisition, and battle damage assessment. A Wasp system consists of two air vehicles, two GCSs, and one reconnaissance, surveillance, and target acquisition (RSTA) kit.

RQ-11 Raven (Block 1) - Raven is a small UAS with a wingspan of 4.6 feet, weight of 5 pounds and endurance of 90 minutes. The Raven employs a gimbaled EO/IR sensor. The Raven can be carried by personnel on foot and provides the company level unit an organic near real time ISR capability that facilitates rapid battlefield decision making. A Raven system consists of three air vehicles, two GCS, and one RSTA kit.

RQ-20 Puma (Block 2) - Puma is an all environment UAS with a wingspan of 9.2 feet, weight of 13 pounds and endurance of 2.5 hours. The PUMA has demonstrated ranges up to 28 kilometers. The standard payload consists of a gimbaled turret with an EO/IR sensor. A Signals Intelligence payload is also available. The PUMA provides an organic, persistent ISR capability to battalion level units. Additionally, it has been used extensively by Route Clearance Platoons (RCP) and Combat Logistics Patrols (CLP) to enhance force protection and detect Improvised Explosive Devices (IEDs). A Puma system consists of two air vehicles, two GCSs, and one RSTA kit.

Long Endurance Small UAS - LE SUAS is an organic Group 1-2 UAS operated and maintained by a ground or similar tactical unit. It includes Vertical Take Off and Landing (VTOL) kit capability, quiet electric motor/hybrid fuel cell technology, high definition electro optic/infrared/laser (marker or designator) payload, and long range antenna kit. The air vehicle travels at an altitude of about 500-1000 feet about ground level at an approximate speed of 35 knots with an endurance of greater than eight hours with a fuel cell, and four hours with battery. It can be launched with an optional VTOL kit or with a launcher system. Mission sets include real-time full motion video for airborne intelligence, surveillance, reconnaissance (AISR), force protection, targeting, pattern of life observation, high value target tracking, control of indirect fires, full motion video to support target analysis, target package development, counter small UAS, spectrum operations (e.g. SIGINT/Cyber/EW) and communications relay/

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305232M / *RQ-11 UAV*	**Project (Number/Name)** 2292 / *Unmanned Air Systems (Intel)*

extension. A system consists of three air vehicles, one ground control station, and associated equipment. Additionally, this system and similar organic small UAS require system modifications and integration to adapt for Field User Evaluations (FUE).

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 and Support	0.000	1.106	0.256	0.000	0.256
Articles:	-	-	-	-	-
FY 2018 Plans: -Continue SOMGCS/THS development and transition to production. -Continue development and integration of Mobile Ad hoc Networks communication relay (MANET). -Continue development of SIGINT.					
FY 2019 Base Plans: -Continue and complete integration of electronic warfare capability (SIGINT) kit, laser marker, and Mobile Ad hoc Networks communication relay (MANET). -Initiate software development for SOMGCS/THS to improve digital interoperability.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The overall decrease of the project from FY18 to FY19 of .850M is due to a reduction of integration and assessment requirements for SOMGCS, Laser Marker, and MANET.					
Title: Test and Evaluation (Operational Assessment)	0.000	0.916	0.268	0.000	0.268
Articles:	-	-	-	-	-
FY 2018 Plans: -Initiate operational assessment of MANET, and Laser Marker. -Initiate assessment of low cost, commercial available Unmanned Aerial Systems to inform future procurements, and determine potential adversary capabilities. -Initiate operational assessment of SOMGCS.					
FY 2019 Base Plans: -Continue operational assessment of MANET, and Laser Marker. -Continue assessment of low cost, commercial available Unmanned Aerial Systems to inform future procurements, and determine potential adversary capabilities. -Complete operational assessment of SOMGCS.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305232M / *RQ-11 UAV*	**Project (Number/Name)** 2292 / *Unmanned Air Systems (Intel)*

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 overall decrease of the project from FY18 to FY19 of .648M is due to a reduction of integration and assessment requirements for SOMGCS, Laser Marker, and MANET.					
Accomplishments/Planned Programs Subtotals	0.000	2.022	0.524	0.000	0.524

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/4757: *RQ-11 UAV*	5.793	10.154	3.848	-	3.848	34.711	39.845	30.623	21.949	Continuing	Continuing

Remarks

D. Acquisition Strategy

The program office is pursuing a rapid acquisition approach to quickly field new technology and capabilities to the warfighter. The strategy is to use evolutionary acquisition with incremental developments to meet the final desired Small Unit Remote Scouting System (SURSS) requirements (Joint USMC/USA/SOCOM capabilities). The next increment will involve an evolution to a Group 1-2 (Family of System) individually capable of executing requirements for long, medium and short range missions in fulfillment of the SURSS requirement. A comprehensive review of the Next Generation service small UAS needs and requirements are being generated at CD&I to update current requirements documents.

E. Performance Metrics

Successful operational test of MANET, SIGINT and Laser Marker payloads.
Successful operational test of SOMGCS.
Fielding of the SOMGCS, MANET, SIGINT and Laser Marker payloads in accordance with planned schedule.
Fielding of remaining RQ-20 PUMA systems in accordance with planned schedule.
Demonstrated improvements in Digital Interoperability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305232M / *RQ-11 UAV*	Project (Number/Name) 2292 / *Unmanned Air Systems (Intel)*	

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 Years Cumulative Funding	Various	Various : Various	1.342	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
SOMGCS/THS Software Integration	WR	NAWCWD : China Lake, CA	0.435	0.000	Jan 2017	0.224	Dec 2017	0.076	Dec 2018	-		0.076	Continuing	Continuing	Continuing
MANET Integration	WR	NAWCAD : Pax River, MD	0.450	0.000	Jan 2017	0.361	Dec 2017	0.085	Dec 2018	-		0.085	Continuing	Continuing	Continuing
Laser Marker Integration	WR	NAWCAD : Pax River, MD	0.000	0.000		0.362	Dec 2017	0.095	Dec 2018	-		0.095	Continuing	Continuing	Continuing
		Subtotal	2.227	0.000		0.947		0.256		-		0.256	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 Analysis	WR	NAWCAD : Pax River, MD	1.215	0.000	Nov 2016	0.159	Nov 2017	0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	1.215	0.000		0.159		0.000		-		0.000	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

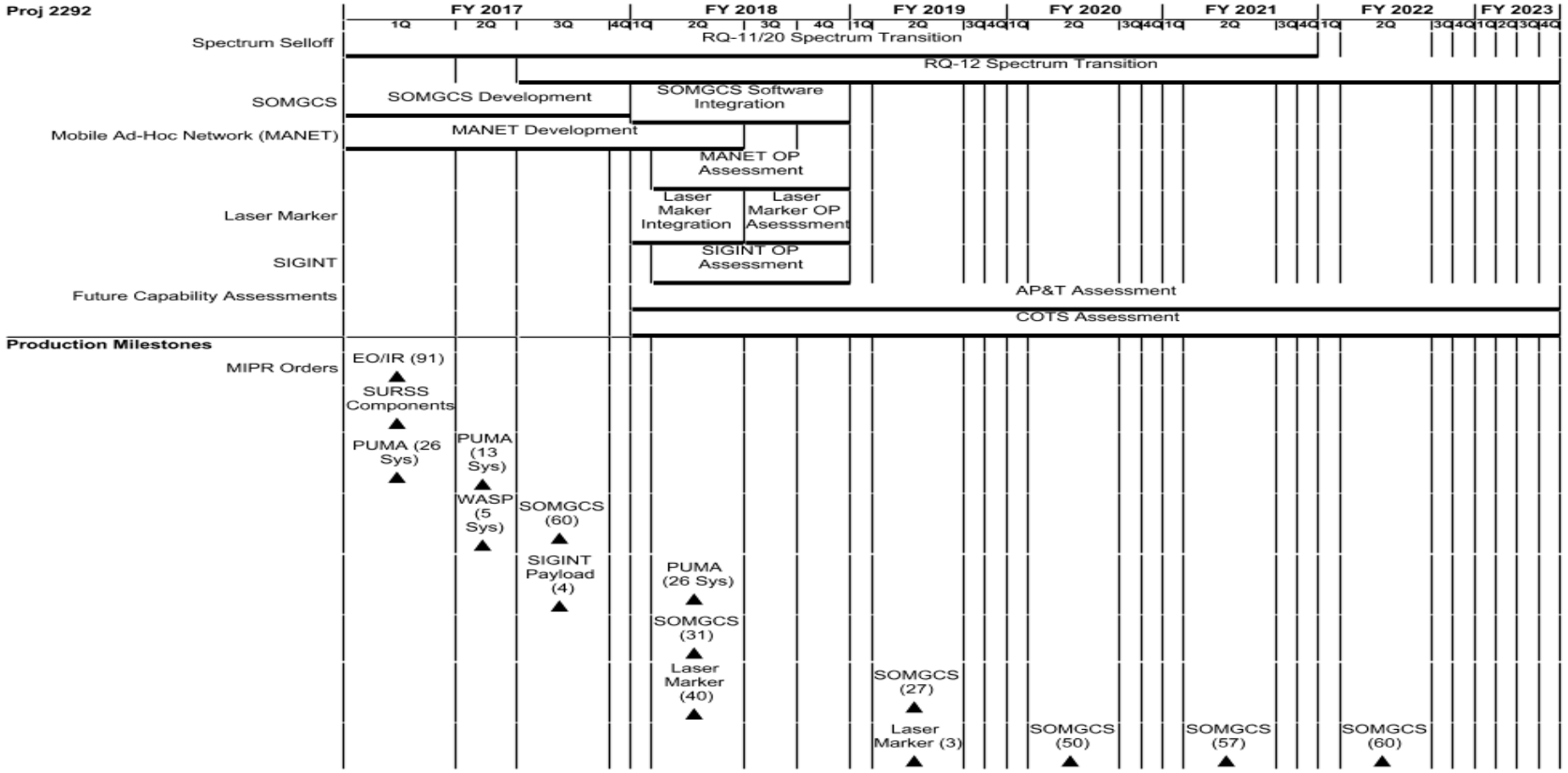
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
COTS UAS Analysis	WR	NAWCAD : Pax River, MD	0.000	0.000		0.250	Jan 2018	0.000		-		0.000	0.000	0.250	-
SOMGCS/THS Operational Assessment	WR	NAWCAD : Pax River, MD	0.000	0.000		0.225	Jan 2018	0.083	Jan 2019	-		0.083	0.000	0.308	-
Laser Marker Operational Assessment	WR	NAWCAD : Pax River, MD	0.000	0.000		0.283	Jan 2018	0.090	Jan 2019	-		0.090	0.000	0.373	-
MANET Operational Assessment	WR	NAWCAD : Pax River, MD	0.000	0.000		0.158	Jan 2018	0.095	Jan 2019	-		0.095	0.000	0.253	-
		Subtotal	0.000	0.000		0.916		0.268		-		0.268	0.000	1.184	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305232M / *RQ-11 UAV*	Project (Number/Name) 2292 / *Unmanned Air Systems (Intel)*	

	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	3.442	0.000		2.022		0.524		-		0.524	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305232M / *RQ-11 UAV*	**Project (Number/Name)** 2292 / *Unmanned Air Systems (Intel)*



2019OSD - 0305232M - 2292

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305232M / *RQ-11 UAV*	**Project (Number/Name)** 2292 / *Unmanned Air Systems (Intel)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2292				
Spectrum Selloff: Army Led RQ-11/RQ-20 Spectrum Transition	1	2017	4	2021
Spectrum Selloff: Marine Corps Led RQ-12 Spectrum Transition	3	2017	4	2023
SOMGCS: SOMGCS/THS Development	1	2017	4	2017
SOMGCS: SOMGCS/THS Software Integration	1	2018	4	2018
Mobile Ad-Hoc Network (MANET): MANET Development	1	2017	2	2018
Mobile Ad-Hoc Network (MANET): MANET Operational Assessment	2	2018	4	2018
Laser Marker: Laser Marker Integration Verification	1	2018	2	2018
Laser Marker: AV Commercial Laser Marker Operational Assessment	3	2018	4	2018
SIGINT: Signals Operational Asssessment	2	2018	4	2018
Future Capability Assessments: Advanced Payload and Technology Assessment	1	2018	4	2023
Future Capability Assessments: Low Cost COTS Assessment and 3rd Party Parts Qualifications	1	2018	4	2023
Production Milestones: MIPR Orders: FY15 EO/IR	1	2017	1	2017
Production Milestones: MIPR Orders: FY16 SURSS Components	1	2017	1	2017
Production Milestones: MIPR Orders: FY16 PUMA	1	2017	1	2017
Production Milestones: MIPR Orders: FY17 PUMA	2	2017	2	2017
Production Milestones: MIPR Orders: FY17 WASP	2	2017	2	2017
Production Milestones: MIPR Orders: FY17 SOMGCS	3	2017	3	2017
Production Milestones: MIPR Orders: FY17 SIGINT Payloads	3	2017	3	2017
Production Milestones: MIPR Orders: FY18 PUMA	2	2018	2	2018
Production Milestones: MIPR Orders: FY18 SOMGCS	2	2018	2	2018
Production Milestones: MIPR Orders: FY18 Laser Marker	2	2018	2	2018

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305232M / *RQ-11 UAV*	**Project (Number/Name)** *2292 / Unmanned Air Systems (Intel)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: MIPR Orders: FY19 SOMGCS/THS	2	2019	2	2019
Production Milestones: MIPR Orders: FY19 Laser Marker	2	2019	2	2019
Production Milestones: MIPR Orders: FY20 SOMGCS/THS	2	2020	2	2020
Production Milestones: MIPR Orders: FY21 SOMGCS/THS	2	2021	2	2021
Production Milestones: MIPR Orders: FY22 SOMGCS/THS	2	2022	2	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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305234N *I (U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*

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	73.969	5.071	4.835	5.360	-	5.360	5.103	5.210	5.314	5.422	Continuing	Continuing
3192: *RQ-21 BLACKJACK*	73.969	5.071	4.835	5.360	-	5.360	5.103	5.210	5.314	5.422	Continuing	Continuing

A. Mission Description and Budget Item Justification

The RQ-21A BLACKJACK (formerly known as The Small Tactical Unmanned Aircraft System (STUAS)) is a combined United States Navy (USN) and United States Marine Corps (USMC) program that provides persistent maritime and land-based tactical Intelligence, Surveillance, and Reconnaissance/Target Acquisition support for tactical level maneuver decisions and unit level force defense/force protection for Naval amphibious assault ships (multi-ship classes) and Navy and Marine land forces. This system will support Naval Missions such as building the Recognized Maritime Picture, Maritime Security Operations, Maritime Interdiction Operations, and provide support for Naval Units operating from sea/shore in Overseas Contingency Operations. This submission is the USNs portion of the program and has been coordinated with the USMC budget submission PE 0305239M (RQ-21A).

The RQ-21A BLACKJACK system will continue to evolve and upgrade capabilities to satisfy capabilities shortfalls, new requirements, and reliability, maintainability and safety issues. Upgraded capabilities may include Navy Command and Control integration, Weapons Integration, Heavy Fuel Engine, Laser Designator, Frequency Agile Communications Relay, Digital Common Data Link, and cyclic refresh of the Electro-Optical/Infrared camera. RQ-21A BLACKJACK will also continue to expand its shipboard capability across new ship classes.

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. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	5.071	4.835	5.551	-	5.551
Current President's Budget	5.071	4.835	5.360	-	5.360
Total Adjustments	0.000	0.000	-0.191	-	-0.191
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	0.000	0.000	-0.191	-	-0.191

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	Project (Number/Name) 3192 / *RQ-21 BLACKJACK*	

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
3192: *RQ-21 BLACKJACK*	73.969	5.071	4.835	5.360	-	5.360	5.103	5.210	5.314	5.422	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The RQ-21A BLACKJACK (formerly known as The Small Tactical Unmanned Aircraft System (STUAS)) is a combined United States Navy (USN) and United States Marine Corps (USMC) program that provides persistent maritime and land-based tactical Intelligence, Surveillance, and Reconnaissance/Target Acquisition support for tactical level maneuver decisions and unit level force defense/force protection for Naval amphibious assault ships (multi-ship classes) and Navy and Marine land forces. This system will support Naval Missions such as building the Recognized Maritime Picture, Maritime Security Operations, Maritime Interdiction Operations, and provide support for Naval Units operating from sea/shore in Overseas Contingency Operations. This submission is the USNs portion of the program and has been coordinated with the USMC budget submission PE 0305239M (RQ-21A).

The RQ-21A BLACKJACK system will continue to evolve and upgrade capabilities to satisfy capabilities shortfalls, new requirements, and reliability, maintainability and safety issues. Upgraded capabilities may include Navy Command and Control integration, Weapons Integration, Heavy Fuel Engine, Laser Designator, Frequency Agile Communications Relay, Digital Common Data Link, new launch and recovery methods, parts durability and manufacturability, and cyclic refresh of the Electro-Optical/ Infrared (EO/IR) camera. RQ-21A BLACKJACK will also continue to expand its shipboard capability across new 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: Upgrade Efforts	1.833	1.523	2.157	0.000	2.157
Articles:	-	-	-	-	-
FY 2018 Plans: RQ-21A Blackjack Corrective Action Program will continue the correction of deficiencies from the IOT&E Report. The program will continue software engineering and development for block software updates. The program will continue to assess improvements to the fuel tank, maximum gross takeoff weight, recovery system, avionics module, and other components. Initiate assessment of block upgrade plan for the RQ-21A system.					
FY 2019 Base Plans: RQ-21A Blackjack Corrective Action Program will continue the correction of deficiencies from the IOT&E Report. The program will continue software engineering and development for block software updates. The program will continue to assess improvements to the fuel tank, maximum gross takeoff weight, launch and recovery systems,					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
parts durability and manufacturability, avionics module, and other components. Begin implementation of block upgrade plan for the RQ-21A system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY2019 funding request was reduced by $0.634 million to account for the availability of prior year execution balances.					
Title: Engineering and Technical Services ***Articles:*** ***Description:*** Provides for the Government Engineering Technical Support, Logistics Support, Test and Evaluation, other Government Support, Contractor Support Services, Program Management Support, Program related travel in support of the upgrade/payload efforts. ***FY 2018 Plans:*** Continue Government Engineering Technical Support, Test and Evaluation, other Government Support, Contract Support Services, Program Management Support, and program related travel in support of correction of deficiencies and upgrade efforts. ***FY 2019 Base Plans:*** Continue Government Engineering Technical Support, Test and Evaluation, other Government Support, Contract Support Services, Program Management Support, and program related travel in support of correction of deficiencies and upgrade efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY2019 funding request was reduced by $0.109 million to account for the availability of prior year execution balances.	3.238 -	3.312 -	3.203 -	0.000 -	3.203 -
Accomplishments/Planned Programs Subtotals	5.071	4.835	5.360	0.000	5.360

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

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/0444: *STUASLO*	62.956	4.780	14.866	35.065	49.931	17.790	24.629	18.775	18.792	0.000	328.151
• RDTEN/0305239M: *(U)RQ-21A*	8.379	8.899	10.914	-	10.914	10.914	10.913	11.306	10.532	Continuing	Continuing
• PMC/4737: *STUAS/RQ-21A*	87.177	86.241	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	400.638
• PMC/7000: *Spares and Repair Parts*	5.812	11.027	0.000	-	0.000	34.219	0.000	0.000	0.000	0.000	71.620

Remarks

D. Acquisition Strategy

The program office has utilized a competitive acquisition approach for award of the Engineering and Manufacturing Development effort to field a capability that meets threshold requirements. Low Rate Initial Production (LRIP) test article was utilized to successfully complete Initial Operational Test and Evaluation (IOT&E). LRIP continues through Future payload upgrades and development shall be competitively sourced or procured via Government Laboratories with Insitu, the prime contractor, performing integration efforts as required.

E. Performance Metrics

Attainment of Full Rate Production, correction of deficiencies from the IOT&E Report, and attainment of United States Marine Corps and United States Navy Full Operational Capability in accordance with the approved schedule.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

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
Upgrade Efforts/Correction of Deficiencies	C/BOA	Insitu, Inc : Bingen, WA	4.701	1.833	Jul 2017	1.523	Jul 2018	2.157	Jul 2019	-		2.157	Continuing	Continuing	Continuing
Mission Training Device	MIPR	JTC/SIL : Redstone Arsenal, AL	2.136	0.000		0.000		0.000		-		0.000	0.000	2.136	2.716
Prior year Prod Devt no longer funded in the FYDP	Various	Various : Various	26.989	0.000		0.000		0.000		-		0.000	0.000	26.989	26.989
		Subtotal	33.826	1.833		1.523		2.157		-		2.157	Continuing	Continuing	N/A

Remarks

Product development corresponds to R-2A Upgrade 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
Integrated Logistics Support	WR	NAWC-AD : Patuxent River, MD	4.621	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Training Support	WR	NAWC-TSD : Orlando, FL	3.861	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Software Engineering Support	WR	NAWC-WD : China Lake, CA	9.940	1.576	Dec 2016	1.608	Dec 2017	1.470	Dec 2018	-		1.470	Continuing	Continuing	Continuing
Government Engineering Support	WR	NAWC-AD : Patuxent River, MD	12.658	0.525	Dec 2016	0.545	Dec 2017	0.554	Dec 2018	-		0.554	Continuing	Continuing	Continuing
		Subtotal	31.080	2.101		2.153		2.024		-		2.024	Continuing	Continuing	N/A

Remarks

Support is included within R-2A Engineering and Technical Services.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	Project (Number/Name) 3192 / *RQ-21 BLACKJACK*	

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	TBD	OPTEVFOR : Norfolk, VA	2.528	0.384	Jul 2017	0.391	Jul 2018	0.400	Jul 2019	-		0.400	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	OPTEVFOR : Norfolk, VA	0.227	0.040	Dec 2016	0.040	Dec 2017	0.040	Dec 2018	-		0.040	Continuing	Continuing	Continuing
		Subtotal	2.755	0.424		0.431		0.440		-		0.440	Continuing	Continuing	N/A

Remarks

Test and Evaluation is included within R-2A Engineering and Technical Services.

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	MIPR	DTIC : FT. Belvoir, VA	2.672	0.230	Mar 2017	0.235	Mar 2018	0.240	Mar 2019	-		0.240	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	Bowhead : Patuxent River, MD	0.936	0.435	Jan 2017	0.443	Jan 2018	0.451	Jan 2019	-		0.451	Continuing	Continuing	Continuing
Travel	WR	Various : Various	0.351	0.048	Oct 2016	0.050	Oct 2017	0.048	Oct 2018	-		0.048	Continuing	Continuing	Continuing
Prior Year Mgmt Svcs no longer funded in the FYDP	Various	Various : Various	2.349	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	6.308	0.713		0.728		0.739		-		0.739	Continuing	Continuing	N/A

Remarks

Management Services is included within R-2A Engineering and Technical Services.

	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	73.969	5.071		4.835		5.360		-		5.360	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

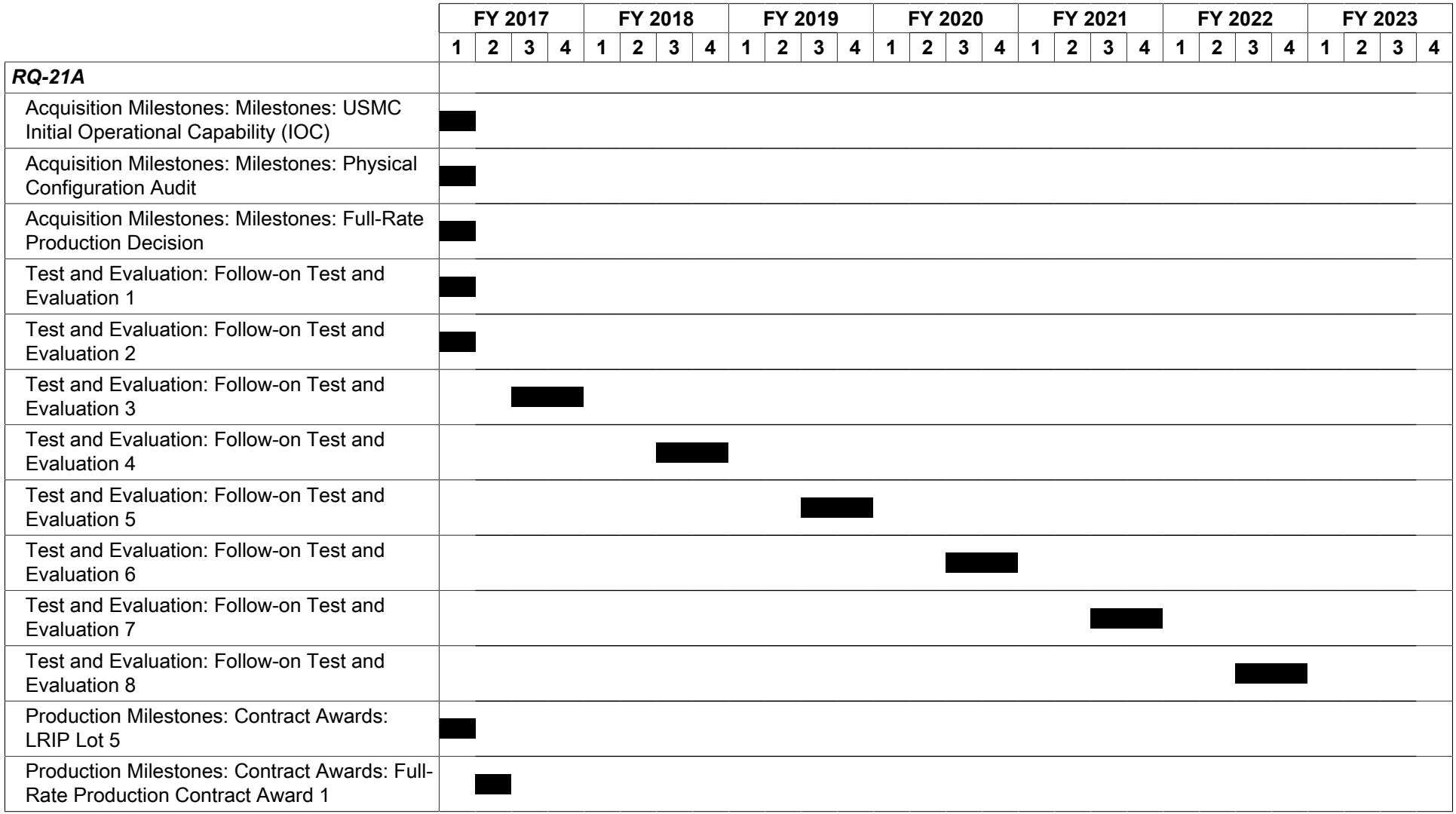


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

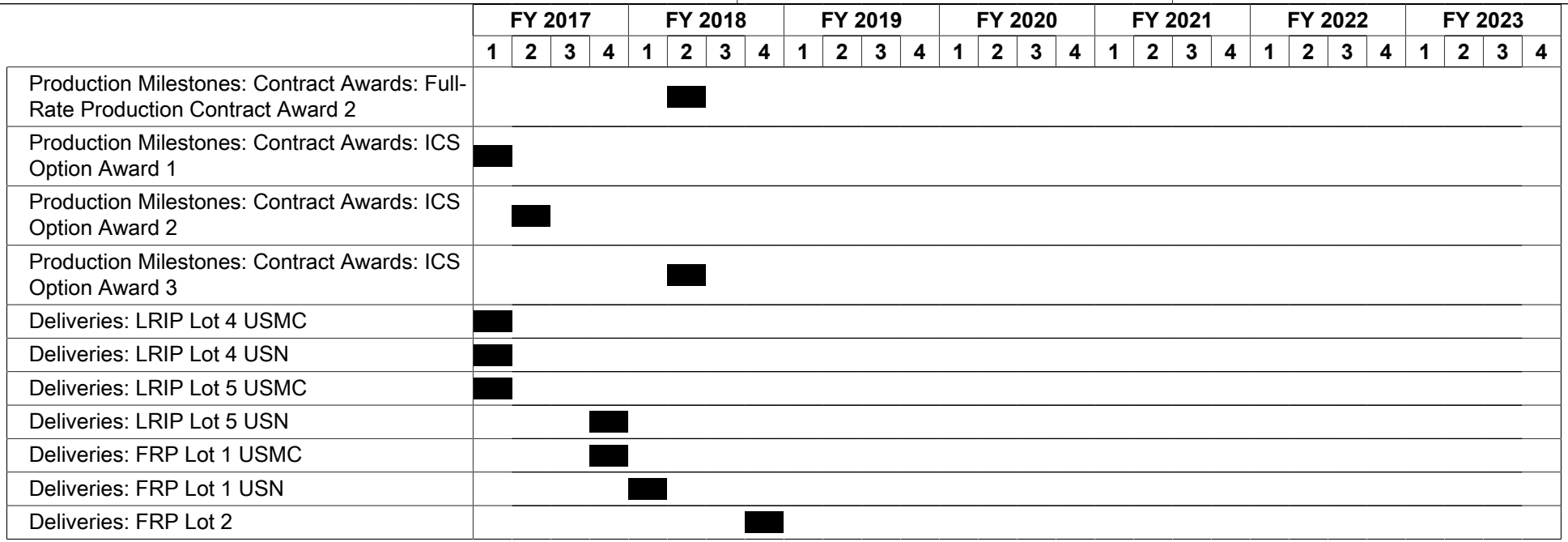


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RQ-21A				
Acquisition Milestones: Milestones: USMC Initial Operational Capability (IOC)	1	2017	1	2017
Acquisition Milestones: Milestones: Physical Configuration Audit	1	2017	1	2017
Acquisition Milestones: Milestones: Full-Rate Production Decision	1	2017	1	2017
Test and Evaluation: Follow-on Test and Evaluation 1	1	2017	1	2017
Test and Evaluation: Follow-on Test and Evaluation 2	1	2017	1	2017
Test and Evaluation: Follow-on Test and Evaluation 3	3	2017	4	2017
Test and Evaluation: Follow-on Test and Evaluation 4	3	2018	4	2018
Test and Evaluation: Follow-on Test and Evaluation 5	3	2019	4	2019
Test and Evaluation: Follow-on Test and Evaluation 6	3	2020	4	2020
Test and Evaluation: Follow-on Test and Evaluation 7	3	2021	4	2021
Test and Evaluation: Follow-on Test and Evaluation 8	3	2022	4	2022
Production Milestones: Contract Awards: LRIP Lot 5	1	2017	1	2017
Production Milestones: Contract Awards: Full-Rate Production Contract Award 1	2	2017	2	2017
Production Milestones: Contract Awards: Full-Rate Production Contract Award 2	2	2018	2	2018
Production Milestones: Contract Awards: ICS Option Award 1	1	2017	1	2017
Production Milestones: Contract Awards: ICS Option Award 2	2	2017	2	2017
Production Milestones: Contract Awards: ICS Option Award 3	2	2018	2	2018
Deliveries: LRIP Lot 4 USMC	1	2017	1	2017
Deliveries: LRIP Lot 4 USN	1	2017	1	2017
Deliveries: LRIP Lot 5 USMC	1	2017	1	2017
Deliveries: LRIP Lot 5 USN	4	2017	4	2017

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305234N / *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: FRP Lot 1 USMC	4	2017	4	2017
Deliveries: FRP Lot 1 USN	1	2018	1	2018
Deliveries: FRP Lot 2	4	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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305239M *I (U)RQ-21A*

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	72.280	8.379	8.899	10.914	-	10.914	10.914	10.913	11.306	10.532	Continuing	Continuing
2298: *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*	72.280	8.379	8.899	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	89.558
3192: *RQ-21 BLACKJACK*	0.000	0.000	0.000	10.914	-	10.914	10.914	10.913	11.306	10.532	Continuing	Continuing

A. Mission Description and Budget Item Justification

The RQ-21A program will provide persistent maritime and land-based tactical Reconnaissance, Surveillance and Target Acquisition (RSTA) data collection and dissemination capability to the war fighter. For the United States Marine Corps (USMC), RQ-21A will provide the Marine Expeditionary Force and subordinate commands (divisions and regiments) with a dedicated, organic Intelligence, Surveillance, and Reconnaissance (ISR) capability delivering intelligence products directly to the tactical commander in real time. For the United States Navy (USN) RQ-21A will provide persistent RSTA support for tactical maneuver decisions and unit-level force defense/force protection for Navy Ships, Marine Corps land forces, Navy Expeditionary Combat Command forces, and Navy Special Warfare Units. This is a combined development program between Navy and Marine Corps. This submission is the Marine Corps portion of the program and has been coordinated with the Navy budget submission under PE 0305234N RQ-21A BLACKJACK.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	9.497	8.899	6.000	-	6.000
Current President's Budget	8.379	8.899	10.914	-	10.914
Total Adjustments	-1.118	0.000	4.914	-	4.914
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	5.002	-	5.002
• Rate/Misc Adjustments	0.000	0.000	-0.088	-	-0.088
• Congressional Directed Reductions Adjustments	-1.118	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305239M / *(U)RQ-21A*	Project (Number/Name) 2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*	

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
2298: *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*	72.280	8.379	8.899	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	89.558
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

In FY19, this effort will move to PE 0305239M PU 3192 (RQ-21 Blackjack).

A. Mission Description and Budget Item Justification

The RQ-21A program will provide persistent maritime and land-based tactical Reconnaissance, Surveillance and Target Acquisition (RSTA) data collection and dissemination capability to the Warfighter. For the United States Marine Corps (USMC), RQ-21A will provide the Marine Expeditionary Force and subordinate commands (divisions and regiments) with a dedicated, organic Intelligence, Surveillance, and Reconnaissance (ISR) capability delivering intelligence products directly to the tactical commander in real time. For the United States Navy (USN) RQ-21A will provide persistent RSTA support for tactical maneuver decisions and unit-level force defense/force protection for Navy Ships, Marine Corps land forces, Navy Expeditionary Combat Command forces, and Navy Special Warfare Units. This is a combined development program between Navy and Marine Corps. This submission is the Marine Corps portion of the program and has been coordinated with the Navy budget submission PE 0305234N RQ-21A BLACKJACK.

The RQ-21A system will continue to evolve addressing capability shortfalls, new requirements, obsolescence equipment, reliability, maintainability, and safety issues. Additional capabilities and/or system upgrades may include Navy Command and Control integration, Weapons Integration, Heavy Fuel Engine, Short Wave Infrared, Laser Designator, Frequency Agile Communications Relay, Digital Common Data link, new launch and recovery methods, parts durability, reparability, and manufacturability, and cyclic refresh of the Electro-optical/Infrared (EO/IR) camera.

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	7.396	7.763	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: RQ-21A Blackjack will continue the correction of deficiencies from the IOT&E Report. The program will continue software engineering and development for block software updates. The program will complete development of the heavy fuel engine and EO/IR camera upgrade and identify a path to integration with the air vehicle. The program will continue to assess improvements to the fuel tank, maximum gross takeoff weight, launch					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
and recovery systems, parts durability and manufacturability, avionics module, and other components. Initiate assessment of block upgrade plan for the RQ-21A system. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No further funding in this PU after FY18.					
Title: Support ***Articles:*** ***FY 2018 Plans:*** -Continue Government Engineering Technical Support, Test and Evaluation, other Government Support, Contractor Support Services, Program Management Support efforts, and program related travel via NAWCAD Pax River in support of upgrades and technology refresh. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No further funding in this PU after FY18.	0.628 -	0.629 -	0.000 -	0.000 -	0.000 -
Title: Test and Evaluation ***Articles:*** ***FY 2018 Plans:*** -Initiate follow-on test and evaluation for Short Wave Infrared (SWIR). -Initiate follow-on test and evaluation for Laser Designator (LD). -Initiate follow-on test and evaluation for Advanced Engine. -Initiate follow-on test and evaluation for software build 7.X.X. ***FY 2019 Base Plans:***	0.355 -	0.507 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*

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 further funding in this PU after FY18.					
Accomplishments/Planned Programs Subtotals	8.379	8.899	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
• RDTEN/0305234N: *(U)SMALL (LEVEL 0) TACTICAL UAS (STUASL0)*	5.071	4.835	5.360	-	5.360	5.103	5.210	5.314	5.422	Continuing	Continuing
• PMC/4737: *RQ-21 UAS*	87.177	86.241	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	400.638
• PMC/7000: *Spares and Repair Parts*	5.812	11.027	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	37.400
• APN/0444: *STUASLO*	62.956	4.780	14.866	35.065	49.931	17.790	24.629	18.775	18.792	0.000	328.151

Remarks

D. Acquisition Strategy

The program office utilized a competitive acquisition approach to award the Engineering and Manufacturing Development effort to field a capability that meets threshold requirements. The Low Rate Initial Production (LRIP) test article was utilized to successfully complete Initial Operational Test and Evaluation. LRIP production continues through FY16 to demonstrate production line maturity. Marine Corps Initial Operational Capability was achieved in 2Q FY16 with entry into full rate production decision occurring in 4Q FY16. Future payload upgrades and development shall be competitively sourced or procured via Government Laboratories with Insitu, the prime contractor, performing integration efforts as required.

E. Performance Metrics

Attainment of Full Rate Production (FRP), correction of Deficiencies from the Initial Operation Test & Evaluation (IOT&E) Report, and attainment of USMC Initial Operational Capability (IOC) and Full Operational Capability (FOC) in accordance with the approved schedule.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*

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/ Upgrades	C/BOA	Insitu, Inc : Bingen, WA	13.534	7.396	Dec 2017	7.763	Feb 2018	0.000		-		0.000	0.000	28.693	-
Product Development/ Upgrades	WR	NAWCAD : Patuxent River, MD	0.765	0.000		0.000		0.000		-		0.000	0.000	0.765	-
Prior Years Cumulative Total	C/FPIF	Insitu, Inc : Bingen, WA	29.062	0.000		0.000		0.000		-		0.000	0.000	29.062	-
		Subtotal	43.361	7.396		7.763		0.000		-		0.000	0.000	58.520	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 Support	WR	NAWCAD : Patuxent River, MD	2.620	0.628	Dec 2016	0.629	Dec 2017	0.000		-		0.000	0.000	3.877	-
		Subtotal	2.620	0.628		0.629		0.000		-		0.000	0.000	3.877	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
Government Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.956	0.355	Dec 2016	0.507	Dec 2017	0.000		-		0.000	0.000	1.818	-
Contractor Test System Support	C/FFP	Insitu, Inc : Bingen, WA	1.788	0.000		0.000		0.000		-		0.000	0.000	1.788	-
		Subtotal	2.744	0.355		0.507		0.000		-		0.000	0.000	3.606	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
Prior Years Cumulative	Various	Various : Various	23.555	0.000		0.000		0.000		-		0.000	0.000	23.555	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*

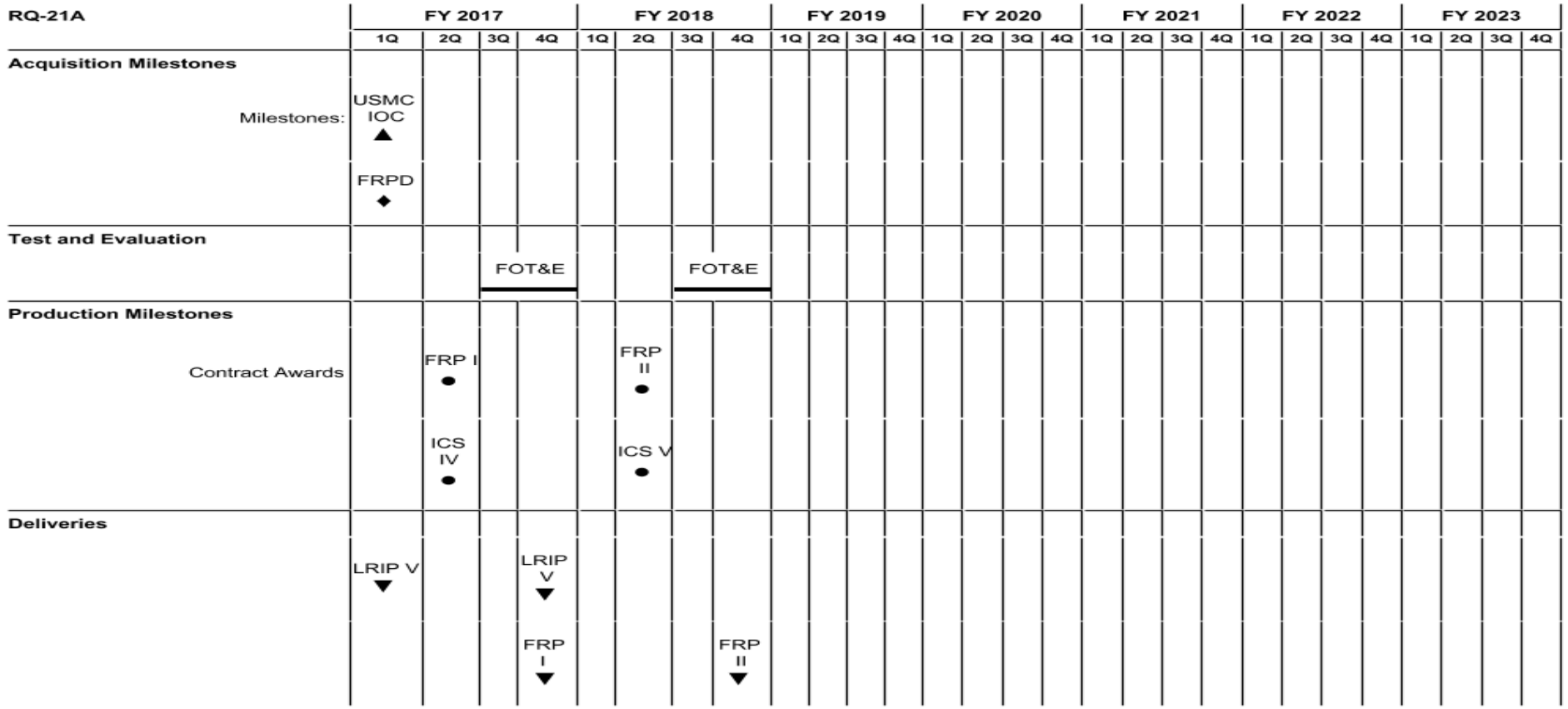
Management Services ($ in Millions)

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	23.555	0.000		0.000		0.000		-		0.000	0.000	23.555	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	72.280	8.379		8.899		0.000		-		0.000	0.000	89.558	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*



2019OSD - 0305239M - 2298

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 2298 / *SMALL (LEVEL 0) TACTICAL UAS (STUAL0)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RQ-21A				
Acquisition Milestones: Milestones:: USMC Initial Operational Capability (IOC)	1	2017	1	2017
Acquisition Milestones: Milestones:: Full Rate Production Decision	1	2017	1	2017
Test and Evaluation: Follow-On Test and Evaluation 3	3	2017	4	2017
Test and Evaluation: Follow-On Test and Evaluation 4	3	2018	4	2018
Production Milestones: Contract Awards: Full-Rate Production Contract Award 1	2	2017	2	2017
Production Milestones: Contract Awards: Full-Rate Production Contract Award 2 - Includes Attrition A/V	2	2018	2	2018
Production Milestones: Contract Awards: ICS Contract Award 4	2	2017	2	2017
Production Milestones: Contract Awards: ICS Contract Award 5	2	2018	2	2018
Deliveries: LRIP Lot 5 USMC	1	2017	1	2017
Deliveries: LRIP Lot 5 USN	4	2017	4	2017
Deliveries: FRP Lot 1 USMC	4	2017	4	2017
Deliveries: FRP Lot 2	4	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305239M / *(U)RQ-21A*	Project (Number/Name) 3192 / *RQ-21 BLACKJACK*	

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
3192: *RQ-21 BLACKJACK*	0.000	0.000	0.000	10.914	-	10.914	10.914	10.913	11.306	10.532	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Prior to FY 2019, this effort was funded under PU 2298: SMALL (LEVEL 0) TACTICAL UAS (STUAL0).

A. Mission Description and Budget Item Justification

The RQ-21A program will provide persistent maritime and land-based tactical Reconnaissance, Surveillance and Target Acquisition (RSTA) data collection and dissemination capability to the Warfighter. For the United States Marine Corps (USMC), RQ-21A will provide the Marine Expeditionary Force and subordinate commands (divisions and regiments) with a dedicated, organic Intelligence, Surveillance, and Reconnaissance (ISR) capability delivering intelligence products directly to the tactical commander in real time. For the United States Navy (USN), RQ-21A will provide persistent RSTA support for tactical maneuver decisions and unit-level force defense/force protection for Navy Ships, Marine Corps land forces, Navy Expeditionary Combat Command forces, and Navy Special Warfare Units. This is a combined development program between Navy and Marine Corps. This submission is the Marine Corps portion of the program and has been coordinated with the Navy budget submission PE 0305234N RQ-21A BLACKJACK.

The RQ-21A system will continue to evolve addressing capability shortfalls, new requirements, obsolescence equipment, reliability, maintainability, and safety issues. Additional capabilities and/or system upgrades may include Navy Command and Control integration, Weapons Integration, Heavy Fuel Engine, Short Wave Infrared, Laser Designator, Frequency Agile Communications Relay, Digital Common Data link, and cyclic refresh of the Electro-optical/Infrared (EO/IR) camera.

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	9.511	0.000	9.511
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: RQ-21A Blackjack Corrective Action Program will continue the correction of deficiencies from the Initial Operation Test & Evaluation (IOT&E) Report. The program will continue software engineering and development for block software updates. The program will continue to assess improvements to the fuel tank, maximum gross takeoff weight, launch and recovery systems, parts durability and manufacturability, avionics module, and other components. Initiate assessment of block upgrade plan for the RQ-21A system.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305239M / *(U)RQ-21A*	Project (Number/Name) 3192 / *RQ-21 BLACKJACK*

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 first year of funding for this PU.					
Title: Support ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Continue Government Engineering Technical Support, other Government Support, Contract Support Services, Program Management Support, and program related travel in support of correction of deficiencies and upgrade efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 first year of funding for this PU.	0.000 -	0.000 -	0.778 -	0.000 -	0.778 -
Title: Test and Evaluation ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Initiate follow-on test and evaluation for Propulsion Module Unit Initiate follow-on test and evaluation for SAR/GMTI payload Initiate follow-on test and evaluation for Laser Designator Initiate follow-on cyber security test and evaluation ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** FY19 first year of funding for this PU.	0.000 -	0.000 -	0.625 -	0.000 -	0.625 -
Accomplishments/Planned Programs Subtotals	0.000	0.000	10.914	0.000	10.914

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

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/0444: *STUASLO*	62.956	4.780	14.866	35.065	49.931	17.790	24.629	18.775	18.792	0.000	328.151
• RDTE/0305234N: *Small Tactical UAS*	5.071	4.835	5.360	-	5.360	5.103	5.210	5.314	5.422	Continuing	Continuing

Remarks

D. Acquisition Strategy

The program office utilized a competitive acquisition approach to award the Engineering and Manufacturing Development effort to field a capability that meets threshold requirements. Full rate production decision was successfully achieved in 4QFY16. Attrition Air Vehicles procurement from FY19 on will be done via sole source contracts with Insitu, the prime contractor. Future payload upgrades and development shall be competitively sourced or procured via Government Laboratories with Insitu performing integration efforts as required.

E. Performance Metrics

Attainment of Full Rate Production (FRP), correction of Deficiencies from the IOT&E Report, and attainment of USMC Initial Operational Capability (IOC) and Full Operational Capability (FOC) in accordance with the approved schedule.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305239M / *(U)RQ-21A*	Project (Number/Name) 3192 / *RQ-21 BLACKJACK*	

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
Upgrade Efforts/Correction of Deficiencies	C/BOA	Insitu, Inc : Bingen, WA	0.000	0.000		0.000		9.511	Jul 2019	-		9.511	0.000	9.511	-
		Subtotal	0.000	0.000		0.000		9.511		-		9.511	0.000	9.511	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 Support	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		0.000		0.556	Dec 2018	-		0.556	0.000	0.556	-
Software Engineering Support	WR	NAWC-WD : China Lake, Ca	0.000	0.000		0.000		0.222	Dec 2018	-		0.222	0.000	0.222	-
		Subtotal	0.000	0.000		0.000		0.778		-		0.778	0.000	0.778	N/A

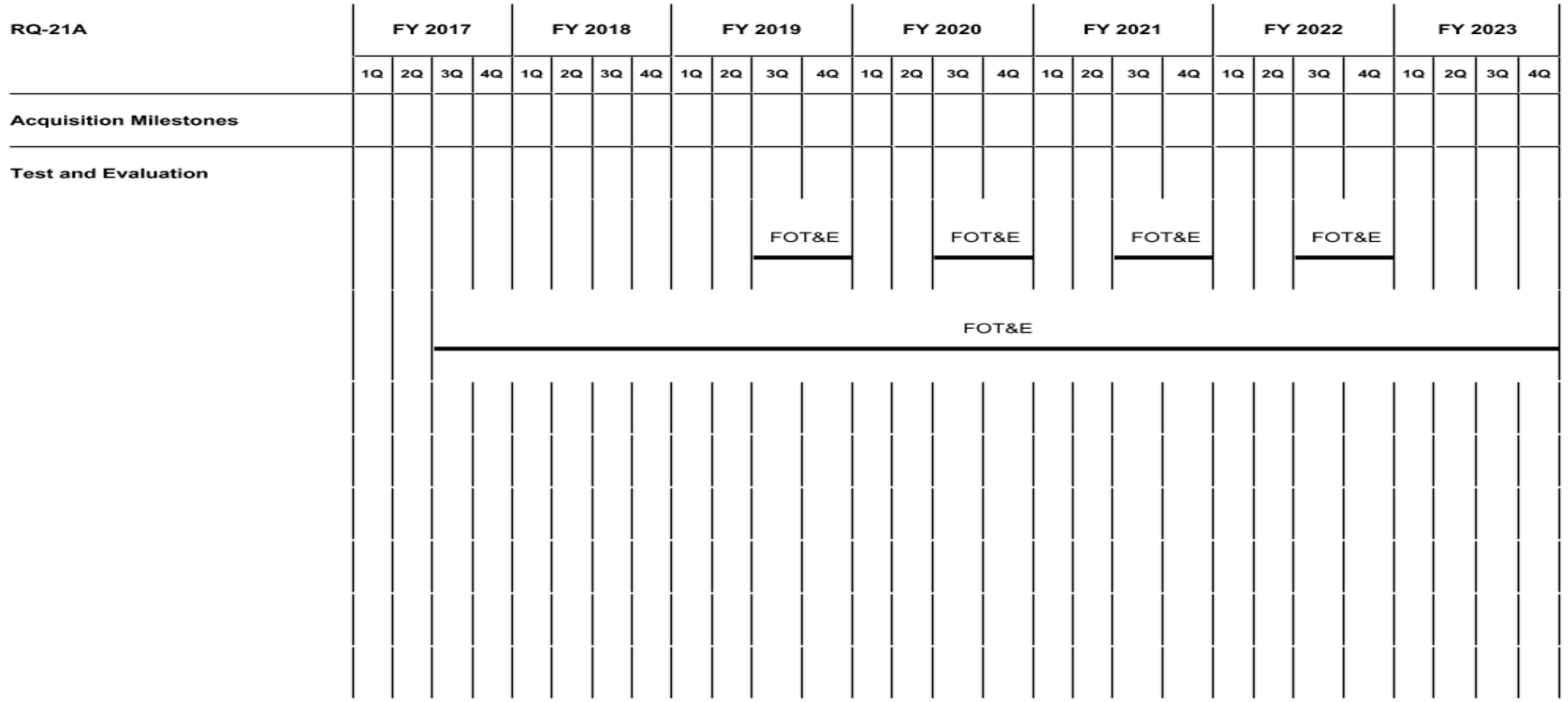
Test and Evaluation ($ in Millions)

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	TBD	OPTEVFOR : Norfolk, VA	0.000	0.000		0.000		0.226	Jul 2019	-		0.226	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	OPTEVFOR : Norfolk, VA	0.000	0.000		0.000		0.399	Dec 2018	-		0.399	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.625		-		0.625	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		10.914		-		10.914	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*



2019OSD - 0305239M - 3192

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305239M / *(U)RQ-21A*	**Project (Number/Name)** 3192 / *RQ-21 BLACKJACK*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
RQ-21A				
Test and Evaluation: Follow-On Test and Evaluation 5	3	2019	4	2019
Test and Evaluation: Follow-On Test and Evaluation 6	3	2020	4	2020
Test and Evaluation: Follow-On Test and Evaluation 7	3	2021	4	2021
Test and Evaluation: Follow-On Test and Evaluation 8	3	2022	4	2022
Test and Evaluation: Follow-On Test and Evaluation 9	3	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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305241N *I (U)MULTI-INTELLIGENCE SENSOR 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	64.765	99.020	81.231	-	81.231	68.518	51.552	52.503	53.874	Continuing	Continuing
3329: *Multi Intelligence Sensor Development*	0.000	26.595	31.162	27.180	-	27.180	27.692	28.221	28.735	29.682	Continuing	Continuing
3383: *P-8 Quick Reaction Capability (QRC)*	0.000	38.170	67.858	54.051	-	54.051	40.826	23.331	23.768	24.192	Continuing	Continuing

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET 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	77.965	99.020	94.351	-	94.351
Current President's Budget	64.765	99.020	81.231	-	81.231
Total Adjustments	-13.200	0.000	-13.120	-	-13.120
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-12.000	-	-12.000
• Rate/Misc Adjustments	0.000	0.000	-1.120	-	-1.120
• Congressional Directed Reductions Adjustments	-13.200	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305241N / *(U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT*	Project (Number/Name) 3329 / *Multi Intelligence Sensor 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
3329: *Multi Intelligence Sensor Development*	0.000	26.595	31.162	27.180	-	27.180	27.692	28.221	28.735	29.682	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET 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 / 7					R-1 Program Element (Number/Name) PE 0305241N / *(U)MULTI-INTELLIGENCE SENSOR DEVELOPMENT*				Project (Number/Name) 3383 / *P-8 Quick Reaction Capability (QRC)*			
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**
3383: *P-8 Quick Reaction Capability (QRC)*	0.000	38.170	67.858	54.051	-	54.051	40.826	23.331	23.768	24.192	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The details of this program element are classified SECRET and are submitted annually to Congress in the classified budget justification books.

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305242M *I (U)Unmanned Aerial Systems (UAS) Payloads*							
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	9.246	11.181	18.578	5.956	-	5.956	5.955	8.631	5.952	6.097	Continuing	Continuing
2052: *RQ-21 Payload Development*	0.000	0.000	0.000	5.956	-	5.956	5.955	8.631	5.952	6.097	Continuing	Continuing
5501: *Signals Intelligence (SIGINT)*	3.564	6.062	5.618	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.244
5502: *Synthetic Aperture Radar/ Motion Target Indicator (SAR/ MTI)*	5.682	5.119	5.860	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.661
5504: *Wide Area Persistent Surveillance (TNWAS)*	0.000	0.000	7.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.100

A. Mission Description and Budget Item Justification

This is not a new start. In FY19 this effort consolidates PU's 5501, 5502, and 5504 into PU 2052.

The Unmanned Aerial Systems (UAS) Payloads integration program will alleviate Marine Corps Intelligence, Surveillance and Reconnaissance (ISR) capability gaps caused by rapidly changing missions, threats and technologies. It will provide responsive capability to integrate and support rapid fielding of ISR payloads for all UAS within the Marine Corps. Sensor payloads will increase the effectiveness and versatility of the Marine Corps UAS currently planned to have Electro-Optic(EO) / Infrared (IR) collection, communications relay, and automatic identification capabilities. Upgrades include, but are not limited to, Signals Intelligence (SIGINT)/ Electronic Warfare Support (ES), Synthetic Aperture Radar (SAR) / Moving Target Indicator (MTI), Wide Area and Hyperspectral Imagery collection.

These payloads provide the Marine Expeditionary Unit (MEU) organic capabilities that facilitate the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations.

The payload development process will follow a Hybrid Acquisition Model of Incremental/Spiral approach while leveraging work conducted by various government laboratories such as the Office of Naval Research (ONR), Defense Advanced Research Projects Agency (DARPA), Air Force Research Lab (AFRL), Joint Improvised Threat Defeat Agency (JIDA), the National Security Agency (NSA), and the National Geospatial Agency (NGA). All payloads will follow similar acquisition paths but on independent time schedules. These acquisition paths will be defined by three (3) phases, each marked by a decision gate. Phase I establishes the preliminary integration design concept and conduct of technology demonstration with validation of a Technology Readiness Level (TRL) 5/6 as the decision gate for Phase II. Phase II establishes full payload-to-Unmanned Aircraft System (UAS) integration during which time all necessary program management, engineering, fabrication, test, and evaluations activities are conducted to achieve Test Article Fabrication, System Test and Evaluation, Integrated Logistics Support (ILS) and Training Concept development, and Data Management and Documentation. Validation of funding, derived requirements, project risks, cost and schedule estimates, contracting strategy

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305242M *I (U)Unmanned Aerial Systems (UAS) Payloads*

and achievement of TRL 7 or higher constitute the decision gate for Phase III. Phase III is program of record transition which supports a production decision based on the exit criteria from Phase II.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	11.181	18.578	10.029	-	10.029
Current President's Budget	11.181	18.578	5.956	-	5.956
Total Adjustments	0.000	0.000	-4.073	-	-4.073
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-10.029	-	-10.029
• Rate/Misc Adjustments	0.000	0.000	5.956	-	5.956

Change Summary Explanation

In FY19 this effort consolidates PU's 5501, 5502, and 5504 into PU 2052.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	Project (Number/Name) 2052 / *RQ-21 Payload 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
2052: *RQ-21 Payload Development*	0.000	0.000	0.000	5.956	-	5.956	5.955	8.631	5.952	6.097	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY19 this effort will transition from PE 0305242M/PU 5501, 5502, 5504 to PE 0305242M/PU 2052 (Unmanned Aerial Systems (UAS) Payloads/RQ-21 Payload Development).

The UAS Payloads program will develop and integrate a Signals Intelligence (SIGINT)/ Electronic Warfare Support (ES) payloads for Marine Corps small tactical UASs. SIGINT/ES payloads will fill current capability gaps for the Marine Corps Intelligence, Surveillance and Reconnaissance (ISR) mission and is required as part of the Marine Corps mission to
locate and target adversary Signals of Interest (SOI). The SIGINT/ES payload will leverage payloads previously developed by other Services and/or DoD laboratories to reduce cost and minimize schedule. The payload currently under development is Spectral Bat. Future SIGINT payloads include the Tactical Electro-optical/Infrared (EO/IR) SIGINT for integrated Targeting (TEISIT). Test articles required in order to properly conduct testing requirements in order to field products on schedule to the fleet.

The UAS Payloads program will develop and integrate Synthetic Aperture Radar (SAR) with Moving Target Indicator (MTI) for Marine Corps small tactical UASs. This capability fills
current capability gaps for the Marine Corps Intelligence, Surveillance and Reconnaissance (ISR) mission and will allow Marine Corps ISR assets to locate and track ground targets that cannot effectively be located or tracked with the current ground based or EO/IR airborne sensor technology. The ability to locate and track moving ground targets from small tactical UAS is an essential capability that facilitates the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations. SAR/MTI payloads will leverage payloads previously developed by other Services and/or DoD laboratories to reduce cost and minimize schedule.

The UAS Payloads program will develop and integrate Wide Area Persistent Surveillance (WAS) payloads for Marine Corps small tactical UASs. This capability fills current capability
gaps for the Marine Corps Intelligence, Surveillance and Reconnaissance (ISR) mission and will allow Marine Corps ISR assets the ability to improve battlefield awareness, improve
the capability to assure access and hold at risk, and enable power projection in environments that are not currently accessible is an essential capability that facilitates the six functions of
Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations. The current payload in development is the
Tactical Nighttime Wide Area Surveillance (TNWAS) payload. Future WAS payloads include the Spectral and Reconnaissance Imagery for Tactical Exploitation (SPRITE) payload.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 2052 / *RQ-21 Payload Development*

The WAS payloads will leverage payloads previously developed by other Services and/or DoD laboratories to reduce cost and minimize schedule.

Test articles required in order to properly conduct testing requirements in order to field products on schedule to 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: Product Development	0.000	0.000	4.512	0.000	4.512
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: -Initiate a Field User Evaluation of the Spectral Bat V4 payload. -Continue development of a Tactical EO/IR SIGINT Integrated for Targeting (TEISIT) payload system. -Continue Government Engineering Technical Support, other Government Support, Contract Support Services, Program Management Support, and program related travel in support of the Tactical EO/IR SIGINT Integrated for Targeting (TEISIT) payload system. -Continue development of Wide Area Surveillance software.					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The FY2019 funding request was increased by $4.512 million to account for the re-alignment of funds from PU's 5501, 5502, and 5504 to PU 2052.					
Title: Support	0.000	0.000	0.846	0.000	0.846
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: -Continue Government Engineering Technical Support, other Government Support, Contract Support Services, Program Management Support, and program related travel in support of the Tactical EO/IR SIGINT Integrated for Targeting (TEISIT) payload system.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 2052 / *RQ-21 Payload 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 Integrated Logistics Support (ILS), training concept development and data management/ documentation. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY2019 funding request was increased by $0.846 million to account for the re-alignment of funds from PU's 5501, 5502, and 5504 to PU 2052.					
Title: Management Services ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** -Continue development of a Tactical EO/IR SIGINT Integrated for Targeting (TEISIT) payload system. -Document Field User Evaluation (FUE) reports. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY2019 funding request was increased by $0.303 million to account for the re-alignment of funds from PU's 5501, 5502, and 5504 to PU 2052.	0.000 -	0.000 -	0.303 -	0.000 -	0.303 -
Title: Test and Evaluation ***Articles:*** ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** Continue developmental testing ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:***	0.000 -	0.000 -	0.295 -	0.000 -	0.295 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 2052 / *RQ-21 Payload Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY2019 funding request was increased by $0.295 million to account for the re-alignment of funds from PU's 5501, 5502, and 5504 to PU 2052.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.956	0.000	5.956

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/4787: *UAS Payloads*	14.471	14.193	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	28.664

Remarks

D. Acquisition Strategy

The UAS Payloads program utilizes a Hybrid Acquisition Model of Incremental/Spiral approach for payload development that leverages upon work conducted by various government laboratories in order to field capability that meets threshold requirements, facilitates the six functions of Marine Corps Aviation and the Marine Corps Intelligence Surveillance, and Reconnaissance Enterprise across the range of military operations.

E. Performance Metrics

Validation of funding, derived requirements, project risks, cost and schedule estimates, contracting strategy and achievement of a TRL 7 or higher for Program of Record transition.

A. Successful development of SIGINT payloads, integration into Marine Corps small tactical UAS, and completion of testing.

B. Successful development of SAR/MTI payloads, integration into Marine Corps small tactical UAS, and completion of testing.

C. Successful development of WAS payloads, integration into Marine Corps small tactical UAS, and completion of testing.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	Project (Number/Name) 2052 / *RQ-21 Payload 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	MIPR	ACC-Natick : Natick, MA	0.000	0.000		0.000		4.017	Dec 2018	-		4.017	Continuing	Continuing	Continuing
Government Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.495	Dec 2018	-		0.495	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		4.512		-		4.512	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
Contractor Engineering Support	Various	Various : Various	0.000	0.000		0.000		0.846	Dec 2018	-		0.846	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		0.846		-		0.846	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	MIPR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.303	Dec 2018	-		0.303	0.000	0.303	-
		Subtotal	0.000	0.000		0.000		0.303		-		0.303	0.000	0.303	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	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		0.244	Feb 2019	-		0.244	0.000	0.244	-
Travel	Various	Various : Various	0.000	0.000		0.000		0.051	Oct 2018	-		0.051	0.000	0.051	-
		Subtotal	0.000	0.000		0.000		0.295		-		0.295	0.000	0.295	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	Project (Number/Name) 2052 / *RQ-21 Payload 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	0.000		0.000		5.956		-		5.956	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 2052 / *RQ-21 Payload Development*

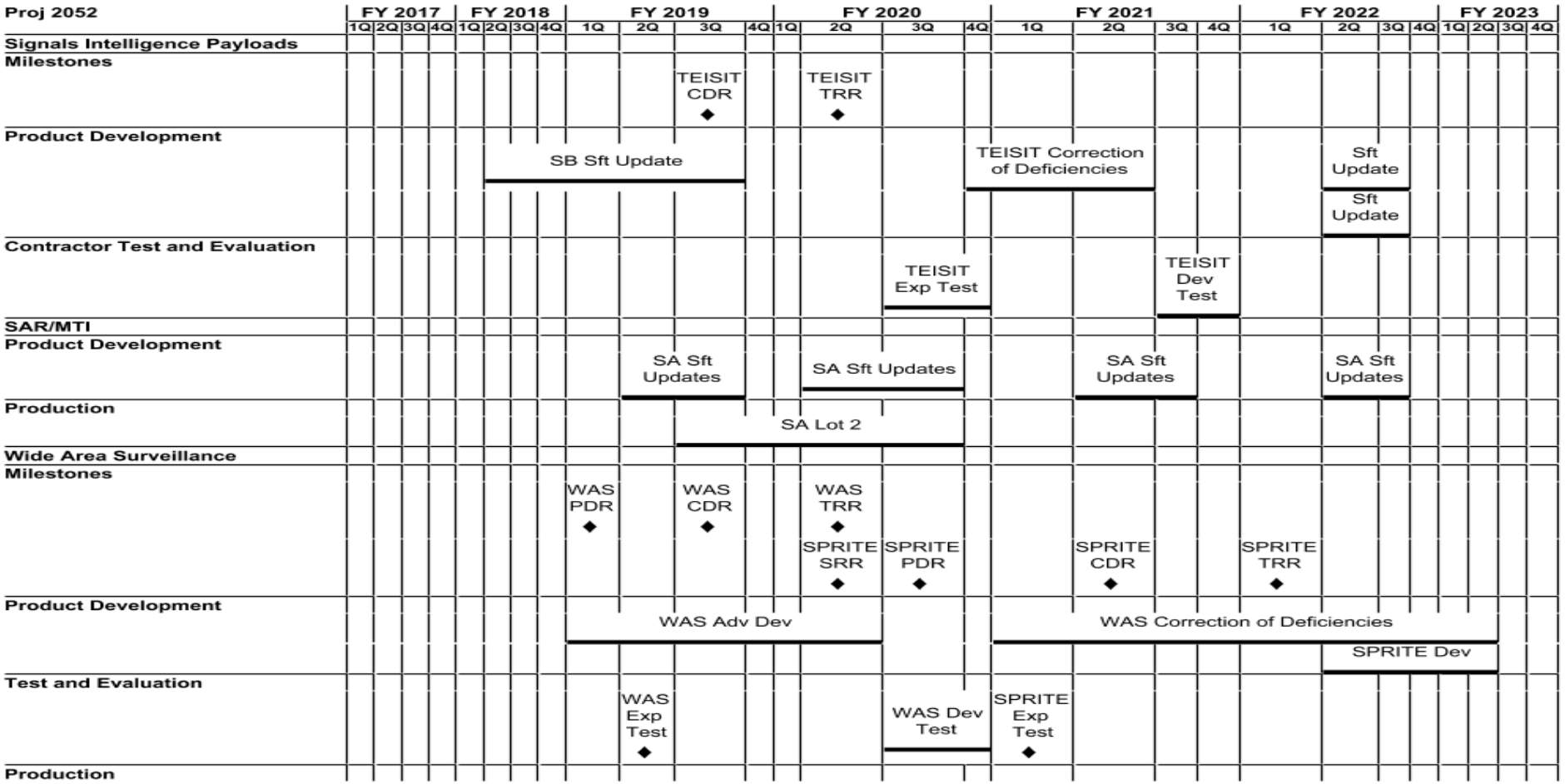


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 2052 / *RQ-21 Payload Development*

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 2052 / *RQ-21 Payload Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2052				
Milestones: TEISIT Critical Design Review	3	2019	3	2019
Milestones: TEISIT Test Readiness Review	2	2020	2	2020
Product Development: Spectral Bat Software Update	2	2018	3	2019
Product Development: TEISIT Correction of Deficiencies	4	2020	2	2021
Product Development: Payload Software Update 1	2	2022	3	2022
Product Development: Payload Sotfware Update 2	2	2022	3	2022
Contractor Test and Evaluation: TEISIT Experimental Test	3	2020	4	2020
Contractor Test and Evaluation: TEISIT Developmental Test	3	2021	4	2021
Product Development: SAR/MTI Software Update	2	2019	3	2019
Product Development: SAR/MTI Software Update 2	2	2020	3	2020
Product Development: SAR/MTI Software Update 3	2	2021	3	2021
Product Development: SAR/MTI Software Update 4	2	2022	3	2022
Production: SAR/MTI	3	2019	3	2020
Milestones: WAS Preliminary Design Review	1	2019	1	2019
Milestones: WAS Critical Design Review	3	2019	3	2019
Milestones: WAS Test Readiness Review	2	2020	2	2020
Milestones: SPRITE System Requirement Review	2	2020	2	2020
Milestones: SPRITE Preliminary Design Review	3	2020	3	2020
Milestones: SPRITE Critical Design Review	2	2021	2	2021
Milestones: SPRITE Test Readiness Review	1	2022	1	2022
Product Development: WAS Advanced Development	1	2019	2	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 2052 / *RQ-21 Payload Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Product Development: WAS Correction of Deficiencies	1	2021	2	2023
Product Development: SPRITE Development	2	2022	2	2023
Test and Evaluation: WAS Experimental Test	2	2019	2	2019
Test and Evaluation: WAS Developmental Test	3	2020	4	2020
Test and Evaluation: SPRITE Experimental Test	1	2021	1	2021
Production: WAS Production Lot 1	2	2021	2	2021
Production: WAS Production Lot 2	2	2022	2	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	Project (Number/Name) 5501 / *Signals Intelligence (SIGINT)*	

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
5501: *Signals Intelligence (SIGINT)*	3.564	6.062	5.618	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.244
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY19 this effort will transition to PE 0305242M/PU 2052 (Unmanned Aerial Systems (UAS) Payloads/RQ-21 Payload Development).

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	5.594	5.139	0.000	0.000	0.000
Articles:	5	-	-	-	-
FY 2018 Plans: - Initiate development of a Tactical EO/IR SIGINT Integrated for Targeting (TEISIT) payload system. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY2019 funding request was decreased by $5.139 million to account for the re-alignment of funds from PU 5501 to PU 2052.					
Title: Support	0.375	0.384	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate development of TEISIT payload software. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5501 / *Signals Intelligence (SIGINT)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY2019 funding request was decreased by $0.384 million to account for the re-alignment of funds from PU 5501 to PU 2052.					
Title: Management Services	0.093	0.095	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete Integrated Logistics Support (ILS), Training Concept development and Data Management/ Documentation - Complete information assurance certification and accreditation					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The FY2019 funding request was decreased by $0.095 million to account for the re-alignment of funds from PU 5501 to PU 2052.					
Accomplishments/Planned Programs Subtotals	6.062	5.618	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
• PMC/4787: *UAS Payloads*	2.971	14.193	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.164

Remarks

D. Acquisition Strategy

In FY19 this effort will transition to PE 0305242M PU 2052 and will fall in line with respective acquisition strategy.

E. Performance Metrics

In FY19 this effort will transition to PE 0305242M/PU 2052 (Unmanned Aerial Systems (UAS) Payloads/RQ-21 Payload Development).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	Project (Number/Name) 5501 / *Signals Intelligence (SIGINT)*	

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	MIPR	AFRL : Dayton, OH	1.500	5.155	Dec 2016	4.692	Feb 2018	0.000		-		0.000	0.000	11.347	-
Government Engineering	WR	NAWCAD : Patuxent River, MD	1.351	0.439	Oct 2016	0.447	Feb 2018	0.000		-		0.000	0.000	2.237	-
		Subtotal	2.851	5.594		5.139		0.000		-		0.000	0.000	13.584	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	MIPR	NAWCAD : Patuxent River, MD	0.619	0.375	Nov 2016	0.384	Feb 2018	0.000		-		0.000	0.000	1.378	-
		Subtotal	0.619	0.375		0.384		0.000		-		0.000	0.000	1.378	N/A

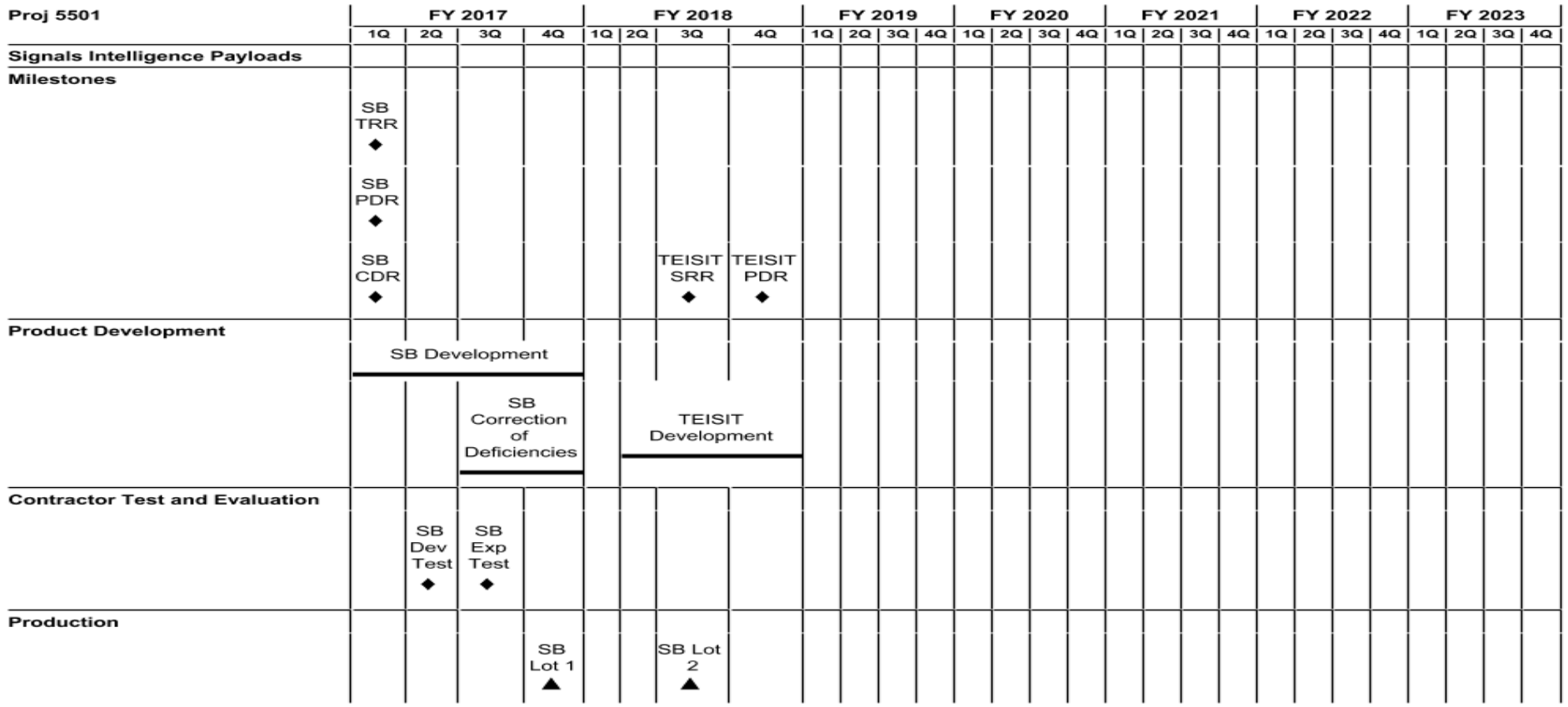
Management Services ($ in Millions)

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	MIPR	NAWCAD : Patuxent River, MD	0.064	0.065	Nov 2016	0.067	Feb 2018	0.000		-		0.000	0.000	0.196	-
Travel	Various	Various : Various	0.030	0.028	Nov 2016	0.028	Feb 2018	0.000		-		0.000	0.000	0.086	-
		Subtotal	0.094	0.093		0.095		0.000		-		0.000	0.000	0.282	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	3.564	6.062		5.618		0.000		-		0.000	0.000	15.244	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5501 / *Signals Intelligence (SIGINT)*



2019DON - 0305242M - 5501

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5501 / *Signals Intelligence (SIGINT)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 5501				
Milestones: Spectral Bat Test Readiness Review	1	2017	1	2017
Milestones: Spectral Bat Preliminary Design Review	1	2017	1	2017
Milestones: Spectral Bat Critical Design Review	1	2017	1	2017
Milestones: TEISIT Systems Requirements Review	3	2018	3	2018
Milestones: TEISIT Preliminary Design Review	4	2018	4	2018
Product Development: Spectral Bat Prototype Design and Development	1	2017	4	2017
Product Development: Spectral Bat Correction of Deficiencies	3	2017	4	2017
Product Development: TEISIT Payload Development	2	2018	4	2018
Contractor Test and Evaluation: Spectral Bat Experimental Test	3	2017	3	2017
Contractor Test and Evaluation: Spectral Bat Developmental Test	2	2017	2	2017
Production: Spectral Bat Production Lot 1	4	2017	4	2017
Production: Spectral Bat Production Lot 2	3	2018	3	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*				Project (Number/Name) 5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)*			
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**
5502: *Synthetic Aperture Radar/ Motion Target Indicator (SAR/ MTI)*	5.682	5.119	5.860	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	16.661
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY19 this effort will transition to PE 0305242M/PU 2052 (Unmanned Aerial Systems (UAS) Payloads/RQ-21 Payload Development).

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	4.133	4.855	0.000	0.000	0.000
Articles:	2	2	-	-	-
FY 2018 Plans: - Complete integrated payload development. - Complete concurrent dual mode functionality of SAR and MTI. - Complete construction of dual mode functionality prototype payload (V3.1).					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The FY2019 funding request was decreased by $4.855 million to account for the re-alignment of funds from PU 5502 to PU 2052.					
Title: Support	0.590	0.604	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate ILS, training concept development and data management/documentation.					
FY 2019 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)*

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 FY2019 funding request was decreased by $.604 million to account for the re-alignment of funds from PU 5502 to PU 2052.					
Title: Management Services	0.104	0.104	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Complete engineering required for flight clearances. - Complete information assurance certification for accreditation. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY2019 funding request was decreased by $.104 million to account for the re-alignment of funds from PU 5502 to PU 2052.					
Title: Test and Evaluation	0.292	0.297	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate and complete developmental testing. ***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 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY2019 funding request was decreased by $.297 million to account for the re-alignment of funds from PU 5502 to PU 2052.					
Accomplishments/Planned Programs Subtotals	5.119	5.860	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
• PMC/4787: *UAS Payloads*	2.971	14.193	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.164

Remarks

D. Acquisition Strategy

In FY19 this effort will transition to PE 0305242M/PU 2052 and will fall in line with respective acquisition strategy.

E. Performance Metrics

In FY19 this effort will transition to PE 0305242M/PU 2052 (Unmanned Aerial Systems (UAS) Payloads/RQ-21 Payload Development).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	Project (Number/Name) 5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)*	

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	MIPR	ACC-Natick : Natick, MA	5.015	3.479	Feb 2017	4.197	Feb 2018	0.000		-		0.000	0.000	12.691	-
Government Engineering	WR	NAWCAD : Patuxent River, MD	0.384	0.654	Nov 2016	0.658	Feb 2018	0.000		-		0.000	0.000	1.696	-
		Subtotal	5.399	4.133		4.855		0.000		-		0.000	0.000	14.387	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	Various	Various : Various	0.268	0.590	Dec 2016	0.604	Feb 2018	0.000		-		0.000	0.000	1.462	-
		Subtotal	0.268	0.590		0.604		0.000		-		0.000	0.000	1.462	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	MIPR	NAWCAD : Patuxent River	0.000	0.292	Nov 2016	0.297	Feb 2018	0.000		-		0.000	0.000	0.589	-
		Subtotal	0.000	0.292		0.297		0.000		-		0.000	0.000	0.589	N/A

Management Services ($ in Millions)

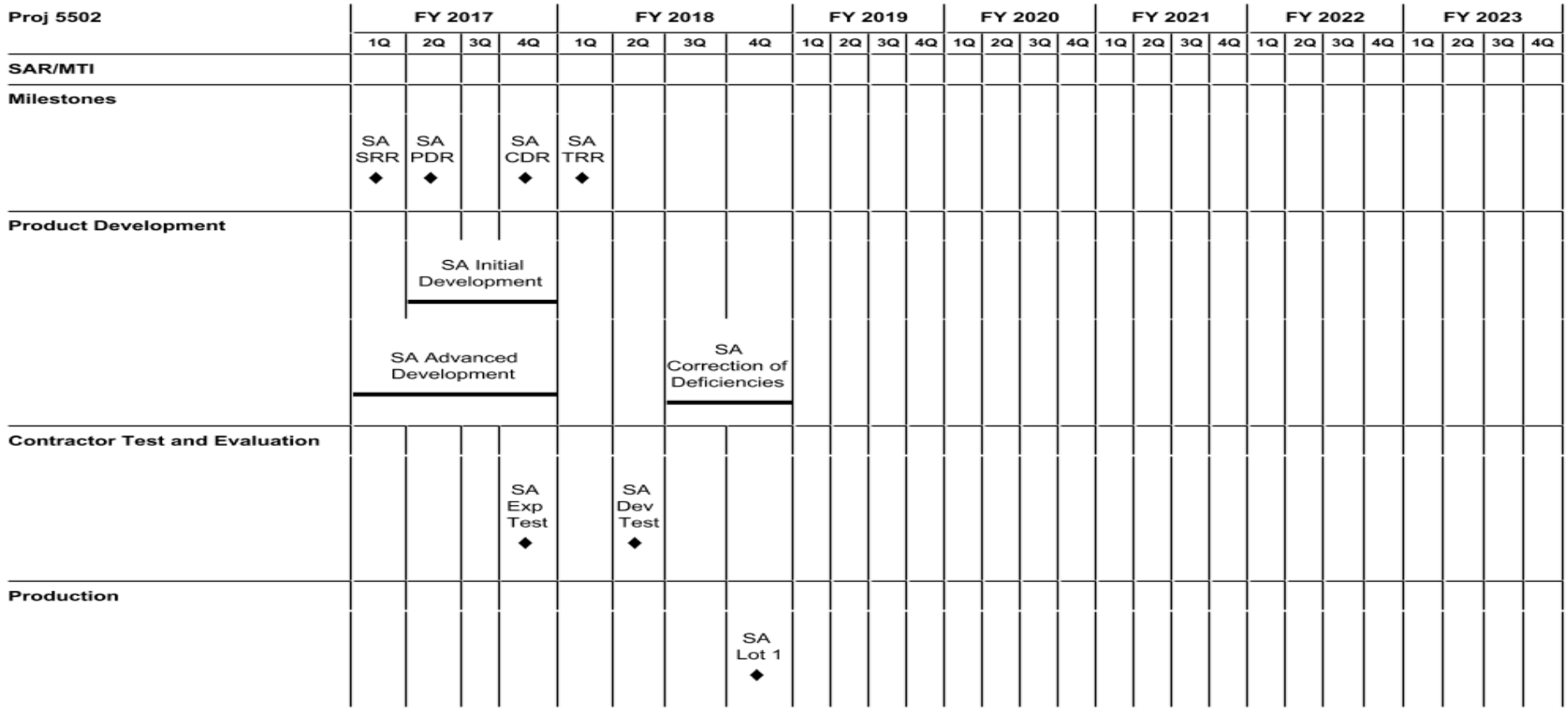
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD : Patuxent River, MD	0.000	0.074	Feb 2017	0.074	Feb 2018	0.000		-		0.000	0.000	0.148	-
Travel	Various	Various : Various	0.015	0.030	Feb 2017	0.030	Feb 2018	0.000		-		0.000	0.000	0.075	-
		Subtotal	0.015	0.104		0.104		0.000		-		0.000	0.000	0.223	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	Project (Number/Name) 5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)*	

	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	5.682	5.119		5.860		0.000		-		0.000	0.000	16.661	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)*



2019DON - 0305242M - 5502

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5502 / *Synthetic Aperture Radar/Motion Target Indicator (SAR/MTI)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 5502				
Milestones: Split Aces System Requirements Review	1	2017	1	2017
Milestones: Split Aces Test Readiness Review	1	2018	1	2018
Milestones: Split Aces Preliminary Design Review	2	2017	2	2017
Milestones: Split Aces Critical Design Review	4	2017	4	2017
Product Development: Split Aces Component Development	2	2017	4	2017
Product Development: Split Aces Design/Prototype	1	2017	4	2017
Product Development: Split Aces Correction of Deficiencies	3	2018	4	2018
Contractor Test and Evaluation: Split Aces Experimental Test	4	2017	4	2017
Contractor Test and Evaluation: Split Aces Developmental Test	2	2018	2	2018
Production: Split Aces Production Lot 1	4	2018	4	2018

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	Project (Number/Name) 5504 / *Wide Area Persistent Surveillance (TNWAS)*	

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
5504: *Wide Area Persistent Surveillance (TNWAS)*	0.000	0.000	7.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.100
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY19 this effort will transition to PE 0305242M/PU 2052 (Unmanned Aerial Systems (UAS) Payloads/RQ-21 Payload Development).

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	5.331	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate Wide Areas Surveillance payload component development.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The FY2019 funding request was decreased by $5.331 million to account for the re-alignment of funds from PU 5504 to PU 2052.					
Title: Support	0.000	1.520	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate development of Wide Area Surveillance software.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5504 / *Wide Area Persistent Surveillance (TNWAS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
The FY2019 funding request was decreased by $1.520 million to account for the re-alignment of funds from PU 5504 to PU 2052.					
Title: Management Services	0.000	0.249	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2018 Plans: - Initiate and complete refinement and documentation of acquisition strategy. - Initiate mapping of requirements to specifications. - Initiate development of an integrated master schedule.					
FY 2019 Base Plans: N/A					
FY 2019 OCO Plans: N/A					
FY 2018 to FY 2019 Increase/Decrease Statement: The FY2019 funding request was decreased by $0.249 million to account for the re-alignment of funds from PU 5504 to PU 2052.					
Accomplishments/Planned Programs Subtotals	0.000	7.100	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
• PMC/4787: *UAS Payloads*	2.971	14.193	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.164

Remarks

D. Acquisition Strategy

In FY19 this effort will transition to PE 0305242M/PU 2052 and will fall in line with respective acquisition strategy.

E. Performance Metrics

In FY19 this effort will transition to PE 0305242M/PU 2052 (Unmanned Aerial Systems (UAS) Payloads/RQ-21 Payload Development).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5504 / *Wide Area Persistent Surveillance (TNWAS)*

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	TBD : TBD	0.000	0.000		5.331	Mar 2018	0.000		-		0.000	0.000	5.331	-
		Subtotal	0.000	0.000		5.331		0.000		-		0.000	0.000	5.331	N/A

Remarks

The 2018 effort for Tactical Nighttime Wide Area Persistent Surveillance (TNWAS) payload development leverages work started by the Office of Naval Research. The contractor performing the work is L3, however the government agency performing contracting activities is TBD.

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/BA	Various : Various	0.000	0.000		1.520	Mar 2018	0.000		-		0.000	0.000	1.520	-
		Subtotal	0.000	0.000		1.520		0.000		-		0.000	0.000	1.520	N/A

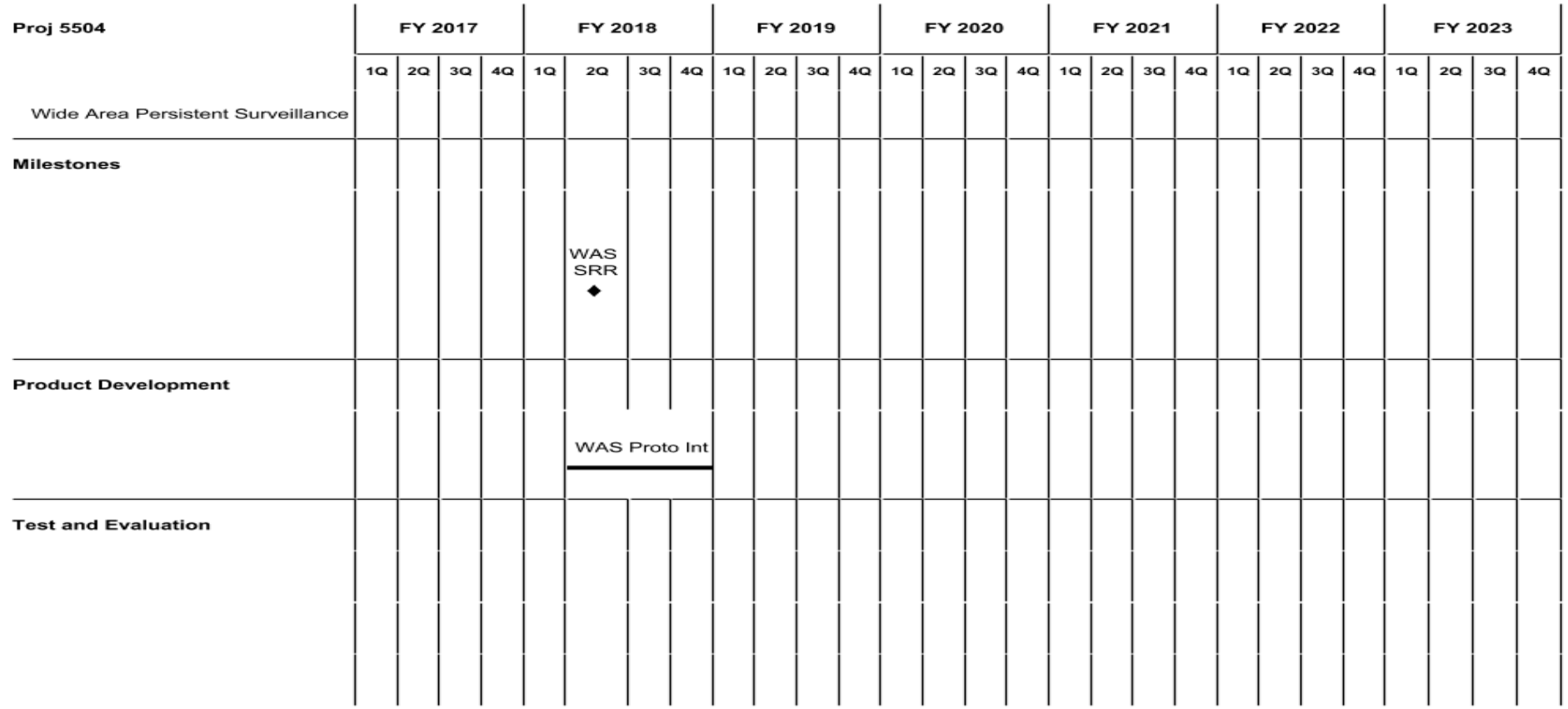
Management Services ($ in Millions)

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	NAWCAD : Patuxent River, MD	0.000	0.000		0.249	Feb 2018	0.000		-		0.000	0.000	0.249	-
		Subtotal	0.000	0.000		0.249		0.000		-		0.000	0.000	0.249	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		7.100		0.000		-		0.000	0.000	7.100	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5504 / *Wide Area Persistent Surveillance (TNWAS)*



2019DON - 0305242M - 5504

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305242M / *(U)Unmanned Aerial Systems (UAS) Payloads*	**Project (Number/Name)** 5504 / *Wide Area Persistent Surveillance (TNWAS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 5504				
Milestones: WAS System Requirement Review	2	2018	2	2018
Product Development: WAS Prototype Integration	2	2018	4	2018

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0305421N *I (U)RQ-4 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	149.892	144.477	229.404	219.894	-	219.894	136.526	98.684	80.594	72.113	0.000	1,131.584
2939: *RQ-4 Modernization*	149.892	144.477	229.404	219.894	-	219.894	136.526	98.684	80.594	72.113	0.000	1,131.584
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 373												

Note

Controls locked prior to updating the Cost to Complete value on the R-2. To reflect the correct funding profile, the CTC value should read 83.826 for a Total Cost of 1,215.410.

MQ-4C Triton RDTE funding for modernization was segregated into a new program element (from PE 0305220N to PE 0305421N) for increased transparency.

A. Mission Description and Budget Item Justification

MQ-4C Triton Unmanned Air System (UAS). The popular name Triton was approved for the MQ-4C UAS in June 2012, designating the RQ-4 Broad Area Maritime Surveillance (BAMS) UAS as the MQ-4C Triton.

The MQ-4C Triton is a high altitude-long endurance UAS designed to provide Fleet and combatant commanders with persistent maritime Intelligence, Surveillance and Reconnaissance (ISR) of nearly all the world's high-density sea-lanes, littorals, and areas of national interest. Teamed with its manned-capability counterpart, the P-8A, Triton will be a key component of the Navy's family of systems to achieve maritime domain awareness. MQ-4C Triton will seek to leverage Maritime Patrol and Reconnaissance Force manpower, training and maintenance efficiencies.

The MQ-4C Triton features sensors designed to provide near worldwide coverage through a network of five orbits inside and outside continental United States, with sufficient air vehicles to remain airborne for 24 hours a day, 7 days a week, out to ranges of 2000 nautical miles. Onboard sensors will provide detection, classification, tracking and identification of maritime targets and include maritime radar, electro-optical/infra-red and Electronic Support Measures systems. Additionally, the MQ-4C will have a communications relay capability designed to link dispersed forces in the theater of operations and serve as a node in the Navy's networked strategy. Tactical-level data analysis will occur in real-time at shore-based mission control sites connected to the air vehicle via satellite communications. Further intelligence exploitation can be conducted at Fleet shore-based sites or aboard aircraft carriers and other ships.

The MQ-4C Triton UAS will implement phased capability upgrades within the ongoing acquisition program to pace capability with rapidly evolving technologies and threats to ensure the Navy maintains persistent ISR dominance through the system's lifecycle, and to support the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. System upgrades will include Multi-Intelligence capabilities, Counter Electronic Attack upgrades, a more robust electronic support capability and continue improvements to baseline mission system payloads.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0305421N *I (U)RQ-4 Modernization*

The MQ-4C air vehicle, mission control system, specialized sensors, and communications suite will play a significant role in achieving the Navy's strategic vision for the 21st century. The Triton system as a persistence ISR enabler provides the supported combatant commander and fleet commander with unparalleled situational awareness of the maritime battle space to develop and sustain the common operational tactical picture. The system will also serve as a Fleet response plan enabler with a persistent, global force offering to provide critical trip wire information for intelligence preparation of the environment. Triton will connect to both the Global Information Grid and the Distributed Common Ground System-Navy information backbone to provide the Warfighter with unprecedented levels of battlespace awareness to synchronize actions necessary to maintain maritime Full Spectrum Superiority.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	181.266	229.404	176.195	-	176.195
Current President's Budget	144.477	229.404	219.894	-	219.894
Total Adjustments	-36.789	0.000	43.699	-	43.699
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.089	0.000			
• Program Adjustments	0.000	0.000	45.518	-	45.518
• Rate/Misc Adjustments	0.000	0.000	-1.819	-	-1.819
• Congressional Directed Reductions Adjustments	-36.700	-	-	-	-

Change Summary Explanation

The Triton program was revised to align key program events and funding (+$45.7M) with the development of the Multi-INT capability upgrade in order to continue to support the Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) Transition Plan.

The FY 2019 funding request was reduced by $0.205M 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 / 7					R-1 Program Element (Number/Name) PE 0305421N / *(U)RQ-4 Modernization*				Project (Number/Name) 2939 / *RQ-4 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**
2939: *RQ-4 Modernization*	149.892	144.477	229.404	219.894	-	219.894	136.526	98.684	80.594	72.113	0.000	1,131.584
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 373

A. Mission Description and Budget Item Justification

MQ-4C Triton Unmanned Air System (UAS). The MQ-4C Triton is a high altitude-long endurance UAS designed to provide Fleet and combatant commanders with persistent maritime Intelligence, Surveillance and Reconnaissance (ISR) of nearly all the world's high-density sea-lanes, littorals, and areas of national interest. Teamed with its manned-capability counterpart, the P-8A, Triton will be a key component of the Navy's family of systems to achieve maritime domain awareness. MQ-4C Triton will seek to leverage Maritime Patrol and Reconnaissance Force manpower, training and maintenance efficiencies.

The MQ-4C Triton features sensors designed to provide near worldwide coverage through a network of five orbits inside and outside continental United States, with sufficient air vehicles to remain airborne for 24 hours a day, 7 days a week, out to ranges of 2000 nautical miles. Onboard sensors will provide detection, classification, tracking and identification of maritime targets and include maritime radar, electro-optical/infra-red and Electronic Support Measures systems. Additionally, the MQ-4C will have a communications relay capability designed to link dispersed forces in the theater of operations and serve as a node in the Navy's networked strategy. Tactical-level data analysis will occur in real-time at shore-based mission control sites connected to the air vehicle via satellite communications. Further intelligence exploitation can be conducted at Fleet shore-based sites or aboard aircraft carriers and other ships.

The MQ-4C Triton UAS will implement phased capability upgrades within the ongoing acquisition program to pace capability with rapidly evolving technologies and threats to ensure the Navy maintains persistent ISR dominance through the system's lifecycle, and to support the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. System upgrades will include Multi-Intelligence capabilities, Counter Electronic Attack upgrades, a more robust electronic support capability and continue improvements to baseline mission system payloads.

The MQ-4C air vehicle, mission control system, specialized sensors, and communications suite will play a significant role in achieving the Navy's strategic vision for the 21st century. The Triton system as a persistence ISR enabler provides the supported combatant commander and fleet commander with unparalleled situational awareness of the maritime battle space to develop and sustain the common operational tactical picture. The system will also serve as a Fleet response plan enabler with a persistent, global force offering to provide critical trip wire information for intelligence preparation of the environment. Triton will connect to both the Global Information Grid and the Distributed Common Ground System-Navy information backbone to provide the Warfighter with unprecedented levels of battlespace awareness to synchronize actions necessary to maintain maritime Full Spectrum Superiority.

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	131.531	216.479	202.555	0.000	202.555
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305421N / *(U)RQ-4 Modernization*	**Project (Number/Name)** 2939 / *RQ-4 Modernization*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: MQ-4C Triton Unmanned Air System (UAS) modernization effort for incorporation of phased capability upgrades. The prime contractor is responsible for integration of upgrades into the Triton UAS including associated management, engineering and logistics activities. Capability upgrades will also include development of system payloads directly with original equipment manufacturers. ***FY 2018 Plans:*** Funding increase from FY17 to FY18 supports higher levels of development effort for the integration of modernization capabilities. FY18 continues development of phased capability upgrades as the program initiates test asset modification and software development, including Multi-Intelligence capabilities in support of the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. Funding includes Sense and Avoid radar development, AMP development and integration of development assets for capability upgrades including electro-optical/infra-red, SIGINT High Band and SIGINT Low Band systems. ***FY 2019 Base Plans:*** FY19 continues development of capability upgrades as the program initiates test asset modification and software development, including Multi-Intelligence capabilities in support of the Intelligence, Surveillance, Reconnaissance and Targeting transition plan. Funding includes Sense and Avoid radar development, AMP development and integration of development assets for capability upgrades including electro-optical/infra-red, SIGINT High Band and SIGINT Low Band systems. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $13.924M from FY18 to FY19 reflects the ramp down in development efforts for Triton's GFE Multi-INT sensor hardware.					
Title: ILS, Support, Studies & Analysis	2.517	2.679	2.789	0.000	2.789
Articles:	-	-	-	-	-
Description: Integrated Logistics Support, Studies and Analysis. ***FY 2018 Plans:*** Funding continues in FY18 to support the development and integration of logistics and product support considerations for Triton's modernization upgrade. Efforts include integrated logistics support, technical engineering services, sensor reliability and maintainability risk reduction, logistics supportability analyses and					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305421N / *(U)RQ-4 Modernization*	**Project (Number/Name)** 2939 / *RQ-4 Modernization*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton UAS modernization capabilities. ***FY 2019 Base Plans:*** Funding continues in FY19 to support the development and integration of logistics and product support considerations for Triton's modernization upgrade. Efforts include integrated logistics support, technical engineering services, sensor reliability and maintainability risk reduction, logistics supportability analyses and environmental planning, modeling and simulation, development of manpower and basing assessments, and development of technical data to support fielding of the MQ-4C Triton UAS modernization capabilities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Increase of $0.110M from FY18 to FY19 is due to increase in required ILS efforts.					
Title: Test & Evaluation (T&E)	7.718	7.543	12.750	0.000	12.750
Articles:	-	-	-	-	-
Description: T&E efforts. ***FY 2018 Plans:*** Funding continues in FY18 to support DT activities, including integrated test team labor to reduce risk in design and development, to perform subsystem level ground and acceptance testing, obtain the necessary satellite communications required for testing and continue OT support to allow test and fielding of the MQ-4C Triton UAS phased capability upgrades in accordance with the program schedule. ***FY 2019 Base Plans:*** Funding continues in FY19 to support DT activities, including integrated test team labor to reduce risk in design and development, to perform subsystem level ground and acceptance testing, obtain the necessary satellite communications required for testing and continue OT support to allow test and fielding of the MQ-4C Triton UAS phased capability upgrades in accordance with the program schedule. Increase from FY18 to FY19 in preparation for the start of IFC 4 ground and flight 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 / 7	**R-1 Program Element (Number/Name)** PE 0305421N / *(U)RQ-4 Modernization*	**Project (Number/Name)** 2939 / *RQ-4 Modernization*

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 $5.207M from FY18 to FY19 is due to preparation for the start of IFC 4 ground and flight test.					
Title: Program Management (PM)	2.711	2.703	1.800	0.000	1.800
Articles:	-	-	-	-	-
Description: PM support and travel. ***FY 2018 Plans:*** Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning, technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international cooperation efforts. ***FY 2019 Base Plans:*** Continue the following: PM support and travel, development of milestone and acquisition-related documentation, capability refinement and open systems architecture development, resource justification, affordability assessments and cost analyses, risk reduction and risk management, system integration and interoperability planning, technology maturity reviews, program protection planning, corrosion prevention planning, and joint and international cooperation efforts. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $0.903 from FY18 to FY19 due to reduction in required PM support for requirements.					
Accomplishments/Planned Programs Subtotals	144.477	229.404	219.894	0.000	219.894

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/0305220N: *(U)MQ-4C Triton*	113.606	84.115	14.395	-	14.395	11.796	11.417	14.094	14.381	0.000	3,537.149
• APN/0442: *MQ-4 Triton*	499.894	579.392	627.265	-	627.265	571.971	605.997	604.330	758.923	5,975.539	10,797.450
• APN/0605: *Spares and Repair Parts*	95.851	56.915	37.403	-	37.403	36.420	6.430	0.000	0.000	0.000	336.973

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305421N / *(U)RQ-4 Modernization*	**Project (Number/Name)** 2939 / *RQ-4 Modernization*	

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
• MILCON/0212176N: *Facilities New Footprint - Fleet Ops*	30.475	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	88.385
• MILCON/0815976N: *Facilities New Footprint - Training*	41.380	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	79.411
• APN/0596: *MQ-4 Series*	0.000	39.996	48.278	-	48.278	7.793	0.000	0.000	0.000	0.000	96.067
• OMN/1D4D: *Weapons Maintenance*	0.000	11.310	16.519	-	16.519	24.003	37.795	46.332	47.315	Continuing	Continuing
• MILCON/0305220N: *Triton FOB 3rd Fleet*	0.000	0.000	0.000	-	0.000	0.000	55.809	0.000	0.000	0.000	55.809

Remarks

D. Acquisition Strategy

The MQ-4C Triton acquisition approach supports the Navy's Maritime Intelligence, Surveillance, Reconnaissance, and Targeting (MISR&T) Transition Plan by providing a stable and effective baseline early operational capability in FY18 to facilitate Fleet introduction and learning while continuing System Development and Demonstration engineering and integrated test on Signals Intelligence (SIGINT) and other upgrades to deliver a Multi-INT configuration at Initial Operational Capability (IOC). Phased capability upgrades will continue post IOC to enable the MQ-4C Triton to keep pace with rapidly evolving technologies and threats, and address correction of deficiencies and obsolescence issues to ensure the Navy maintains persistent Intelligence, Surveillance and Reconnaissance dominance through the system's lifecycle.

E. Performance Metrics

Successfully achieve Integrated Test, Operational Evaluation and Initial Operation Capability.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305421N / *(U)RQ-4 Modernization*	**Project (Number/Name)** 2939 / *RQ-4 Modernization*

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	Northrop Grumman : Rancho Bernardo, CA	87.960	79.169	Nov 2016	146.472	Nov 2017	149.631	Nov 2018	-		149.631	331.154	794.386	796.786
Systems Engineering	Various	Various : Various	9.956	14.273	Nov 2016	8.000	Nov 2017	7.750	Nov 2018	-		7.750	1.000	40.979	-
Systems Engineering	WR	NAWC-AD : Patuxent River, MD	20.088	12.000	Nov 2016	23.529	Nov 2017	22.391	Nov 2018	-		22.391	49.716	127.724	-
Primary Hardware Development	SS/FFP	Raytheon : McKinney, TX	6.979	0.000	Nov 2016	0.000	Nov 2017	0.000	Nov 2018	-		0.000	0.000	6.979	6.979
Primary Hardware Development	C/CPFF	Sierra Nevada Corporation : Beaver Creek, OH	0.000	6.500	Jul 2017	6.500	Jan 2018	0.000		-		0.000	0.000	13.000	13.000
Primary Hardware Development	C/CPFF	Boeing Argon ST : Fairfax, VA	5.128	0.000	Nov 2016	0.000		0.000		-		0.000	0.000	5.128	5.128
Primary Hardware Development	C/CPFF	Ticom Geomatics : Austin, TX	0.000	5.000	Jul 2017	6.281	Jan 2018	6.800	Jan 2019	-		6.800	21.000	39.081	39.281
Primary Hardware Development	WR	NSWC-Crane : Crane, Indiana	10.203	11.027	Nov 2016	14.250	Nov 2017	0.050	Nov 2018	-		0.050	0.150	35.680	-
Primary Hardware Development	C/CPFF	L-3 Communication Systems : Salt Lake City, UT	0.000	0.000		7.757	Jan 2018	12.243	Jan 2019	-		12.243	0.000	20.000	20.000
Systems Engineering	C/CPFF	Mitre : Mclean, VA	1.118	1.952	Nov 2016	1.990	Nov 2017	1.990	Nov 2018	-		1.990	4.000	11.050	11.050
Systems Engineering	C/CPFF	MIT-Lincoln Labs : Lexington, MA	2.456	1.610	Nov 2016	1.700	Nov 2017	1.700	Nov 2018	-		1.700	3.000	10.466	10.466
		Subtotal	143.888	131.531		216.479		202.555		-		202.555	410.020	1,104.473	N/A

Remarks

The Product Development budget resources Northrop Grumman for Multi-INT integration design efforts, Raytheon for an Electro-Optical/Infrared (EO/IR) upgrade contract, Sierra Nevada Corporation for high band sensor kits, Boeing Argon for low band sensor kits, Ticom Geomatics for networking, L-3 Communication Systems for High Gain Common Data Link, NSWC-Crane for Airborne Mission Processor design and MITRE/MIT-LL for Airspace Integration efforts.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305421N / *(U)RQ-4 Modernization*	Project (Number/Name) 2939 / *RQ-4 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
Development Support	Various	Various : Various	1.048	0.518	Nov 2016	0.529	Nov 2017	0.539	Nov 2018	-		0.539	1.550	4.184	-
Integrated Logistics Support	Various	Various : Various	0.650	0.675	Nov 2016	0.800	Nov 2017	0.873	Nov 2018	-		0.873	3.299	6.297	-
Integrated Logistics Support	WR	NAWC-AD : Patuxent River, MD	1.069	1.324	Nov 2016	1.350	Nov 2017	1.377	Nov 2018	-		1.377	4.337	9.457	-
		Subtotal	2.767	2.517		2.679		2.789		-		2.789	9.186	19.938	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	0.650	0.611	Nov 2016	0.676	Nov 2017	0.690	Nov 2018	-		0.690	3.661	6.288	-
Developmental Test & Evaluation	WR	NAWC-AD : Patuxent River, MD	0.446	6.676	Nov 2016	5.857	Nov 2017	10.560	Nov 2018	-		10.560	35.348	58.887	-
Operational Test & Evaluation	Various	Various : Various	0.250	0.250	Nov 2016	0.510	Nov 2017	0.500	Nov 2018	-		0.500	7.200	8.710	-
Developmental Test & Evaluation (SATCOMM)	MIPR	DITCO : Various	0.000	0.181	Nov 2016	0.500	Nov 2017	1.000	Nov 2018	-		1.000	5.000	6.681	-
		Subtotal	1.346	7.718		7.543		12.750		-		12.750	51.209	80.566	N/A

Management Services ($ in Millions)

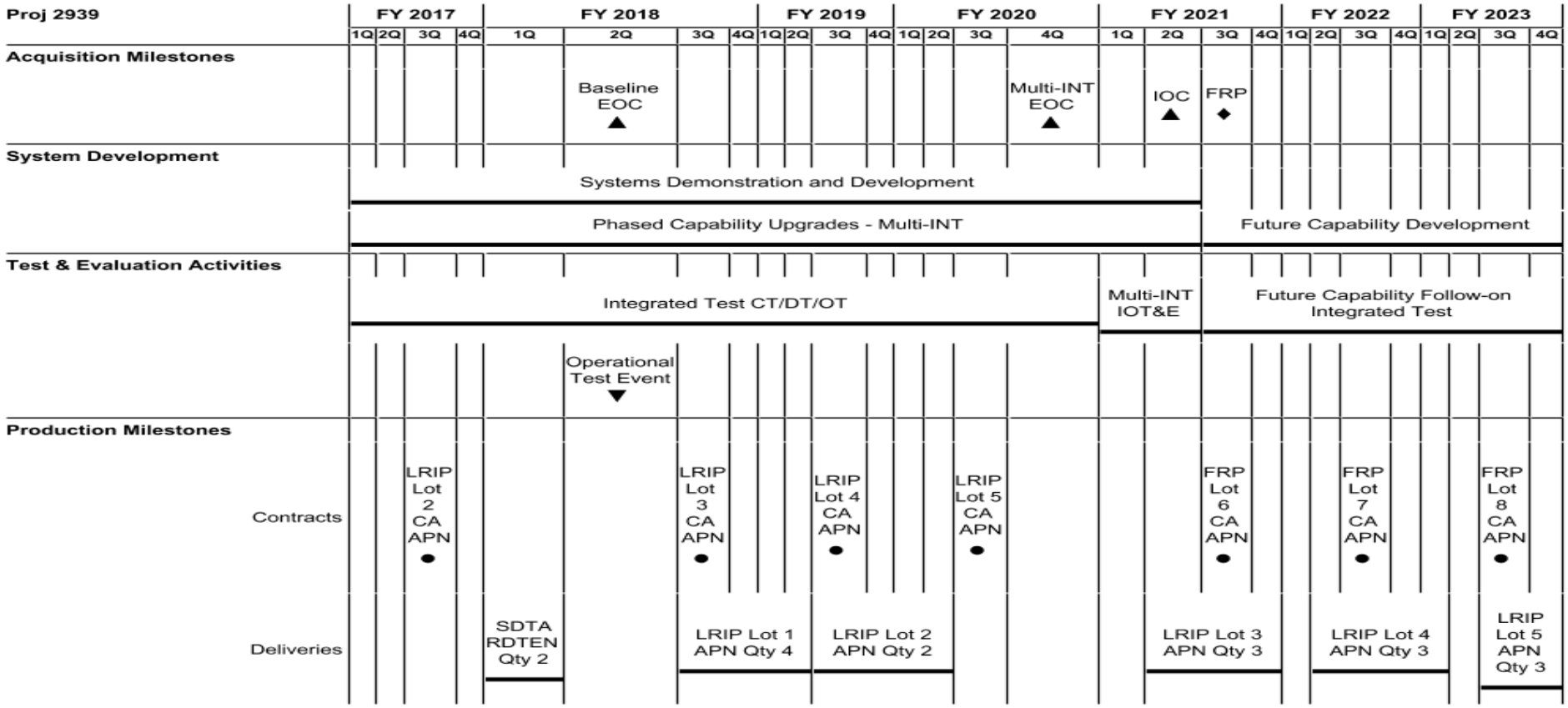
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	Various : Various	0.330	0.166	Nov 2016	0.170	Nov 2017	0.173	Nov 2018	-		0.173	0.896	1.735	-
Travel	Allot	Various : Various	0.061	0.045	Nov 2016	0.033	Nov 2017	0.034	Nov 2018	-		0.034	0.182	0.355	-
Program Management Support	C/CPFF	Ausley : Lexington Park, MD	1.500	2.500	Nov 2016	2.500	Nov 2017	1.593	Nov 2018	-		1.593	4.778	12.871	12.871
		Subtotal	1.891	2.711		2.703		1.800		-		1.800	5.856	14.961	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305421N / *(U)RQ-4 Modernization*	Project (Number/Name) 2939 / *RQ-4 Modernization*	

	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	149.892	144.477		229.404		219.894		-		219.894	476.271	1,219.938	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305421N / *(U)RQ-4 Modernization*	**Project (Number/Name)** 2939 / *RQ-4 Modernization*



2019PB - 0305421N - 2939 MQ-4C Triton development activities are resourced by PE 0305220N and PE 0305421N.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305421N / *(U)RQ-4 Modernization*	**Project (Number/Name)** 2939 / *RQ-4 Modernization*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2939				
Acquisition Milestones: Full Rate Production	3	2021	3	2021
Acquisition Milestones: Initial Operational Capability	2	2021	2	2021
Acquisition Milestones: Multi-INT Early Operational Capability	4	2020	4	2020
Acquisition Milestones: Baseline Early Operational Capability	2	2018	2	2018
System Development: System Development and Demonstration	1	2017	2	2021
System Development: Phased Capability Upgrades - Multi-INT	1	2017	2	2021
System Development: Future Capability Development	3	2021	4	2023
Test & Evaluation Activities: Integrated Test (Combined/Developmental/Operational)	1	2017	4	2020
Test & Evaluation Activities: Multi-INT Initial Operational Test and Evaluation	1	2021	2	2021
Test & Evaluation Activities: Future Capabilities Follow-on Integrated Test	3	2021	4	2023
Test & Evaluation Activities: Operational Test Event	2	2018	2	2018
Production Milestones: Contracts: Low Rate Initial Production Lot 2 Contract Award	3	2017	3	2017
Production Milestones: Contracts: Low Rate Initial Production Lot 3 Contract Award	3	2018	3	2018
Production Milestones: Contracts: Low Rate Initial Production Lot 4 Contract Award	3	2019	3	2019
Production Milestones: Contracts: Low Rate Initial Production Lot 5 Contract Award	3	2020	3	2020
Production Milestones: Contracts: Full Rate Production Lot 6 Contract Award	3	2021	3	2021
Production Milestones: Contracts: Full Rate Production Lot 7 Contract Award	3	2022	3	2022
Production Milestones: Contracts: Full Rate Production Lot 8 Contract Award	3	2023	3	2023
Production Milestones: Deliveries: System Demonstration Test Articles Delivery	1	2018	1	2018
Production Milestones: Deliveries: Low Rate Initial Production Lot 1 Delivery	3	2018	2	2019
Production Milestones: Deliveries: Low Rate Initial Production Lot 2 Delivery	3	2019	2	2020
Production Milestones: Deliveries: Low Rate Initial Production Lot 3 Delivery	2	2021	4	2021

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0305421N / *(U)RQ-4 Modernization*	**Project (Number/Name)** 2939 / *RQ-4 Modernization*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Production Milestones: Deliveries: Low Rate Initial Production Lot 4 Delivery	2	2022	1	2023
Production Milestones: Deliveries: Low Rate Initial Production Lot 5 Delivery	3	2023	4	2023

THIS PAGE INTENTIONALLY LEFT BLANK

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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0308601N *I Modeling & Simulation 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	35.325	4.529	5.238	7.097	-	7.097	7.119	7.291	7.465	7.641	Continuing	Continuing
2222: *Modeling & Simulation*	35.325	4.529	5.238	7.097	-	7.097	7.119	7.291	7.465	7.641	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element addresses projects under the Navy Modeling and Simulation (M&S) Office. It supports technical and management initiatives directed by Congress, Department of Defense (DoD), Secretary of the Navy (SECNAV), and Chief of Naval Operations (CNO) with the aim of bringing organization, focus, and efficiency to the development and use of M&S throughout the Navy and DoD. It provides a central agency for the formulation and implementation of policy and guidance in M&S, and represents Navy interests in Joint and other Agency initiatives. It funds efforts to define and coordinate the corporate Navy M&S policy and guidance to evolve an interoperable and reusable core M&S capability consistent with the M&S technical framework prescribed by DoD.

Efforts are organized around three product areas:
(1) Core Services: This activity provides essential planning and coordination of M&S efforts with other Services, the Office of Secretary of Defense (OSD), the Joint Staff, and other agencies to develop policies and procedures necessary for M&S standards, visibility, and potential reuse across DoD.
(2) Community Services: This activity provides M&S subject matter expert support embedded in the Navy M&S Communities to recommend implementations for M&S policies, standards, VV&A, and reuse within their Community and to ensure that the wider DON and DoD are aware (visibility) of the M&S products and services, initiatives, processes, and standards.
(3) Community Experiments and Prototypes: This activity conducts experiments and prototypes aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy M&S and investigates Service-unique requirements for standards or guidance to achieve M&S efficiencies.

B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	4.709	5.238	5.280	-	5.280
Current President's Budget	4.529	5.238	7.097	-	7.097
Total Adjustments	-0.180	0.000	1.817	-	1.817
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.180	0.000			
• Program Adjustments	0.000	0.000	1.981	-	1.981
• Rate/Misc Adjustments	0.000	0.000	-0.164	-	-0.164

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0308601N *I Modeling & Simulation Support*

Change Summary Explanation

The FY 2017 request was reduced by -$0.270 million to account for the availability of prior year execution balances.

The funding increase from FY 2018 to FY 2019 supports the establishment of a Common Enterprise M&S Environment within the Navy, which will add a new focus on developing standards, architectures and tools for emerging and existing high-priority M&S activities. This will include open interfaces to integrate Live Navy Aircraft/Ship/Subs/Networks with Virtual simulations and Constructive models.

Technical: Not applicable.

Schedule: Not applicable.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0308601N / *Modeling & Simulation Support*	Project (Number/Name) 2222 / *Modeling & Simulation*	

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
2222: *Modeling & Simulation*	35.325	4.529	5.238	7.097	-	7.097	7.119	7.291	7.465	7.641	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element addresses projects under the Navy Modeling and Simulation (M&S) Office. It supports technical and management initiatives directed by Congress, Department of Defense (DoD), Secretary of the Navy (SECNAV), and Chief of Naval Operations (CNO) with the aim of bringing organization, focus, and efficiency to the development and use of M&S throughout the Navy and DoD. It provides a central agency for the formulation and implementation of policy and guidance in M&S, and represents Navy interests in Joint and other Agency initiatives. It funds efforts to define and coordinate the corporate Navy M&S policy and guidance to evolve an interoperable and reusable core M&S capability consistent with the M&S technical framework prescribed by DoD.

Efforts are organized around three product areas:
(1) Core Services: This activity provides essential planning and coordination of M&S efforts with other Services, the Office of Secretary of Defense (OSD), the Joint Staff, and other agencies to develop policies and procedures necessary for M&S standards, visibility, and potential reuse across DoD.
(2) Community Services: This activity provides M&S subject matter expert support embedded in the Navy M&S Communities to recommend implementations for M&S policies, standards, VV&A, and reuse within their Community and to ensure that the wider DON and DoD are aware (visibility) of the M&S products and services, initiatives, processes, and standards.
(3) Community Experiments and Prototypes: This activity conducts experiments and prototypes aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy M&S and investigates Service-unique requirements for standards or guidance to achieve M&S efficiencies.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CORE SERVICES	0.928	1.000	1.032	0.000	1.032
Articles:	-	-	-	-	-
Description: This activity provides essential planning and coordination of M&S efforts with other Services, the Office of Secretary of Defense (OSD), the Joint Staff, and other agencies to develop policies and procedures necessary for M&S visibility and potential reuse across DoD. It provides updates to the Navy M&S website, M&S Master Plan, and M&S Investment Strategy. This activity supports development of common services, tools, and databases to ensure the integration and connectivity of M&S products employed in Naval assessments, training, acquisition, and among operational communities. It manages and maintains the Navy M&S Information Service (NMSIS), the central Naval M&S information resource to support informed M&S investment decision making across DON. It implements and manages the Modeling and Simulation (M&S) Quality Assurance (VV&A) process and guidelines for implementing for modeling, simulation, and data. It					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0308601N / *Modeling & Simulation Support*	**Project (Number/Name)** 2222 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
reviews both new and legacy M&S VV&A plans and reports and develops and maintains the Naval M&S VV&A repository. It establishes and implements a VV&A training curriculum for developers and Accreditation Agents. ***FY 2018 Plans:*** - Promote consistent application of M&S "Best Practices" and associated technologies to improve support across the DON Enterprise. - Review and Update SECNAV M&S policy and guidance. - Educate the M&S workforce on use of M&S to support efficient and interoperable RDT&E. - Provide VV&A, Standards and M&S support to programs, PEOs and other DON activities. - Promulgate M&S Best Practices and Common Tools across DON M&S Enterprise. ***FY 2019 Base Plans:*** - Promote consistent application of M&S "Best Practices" and associated technologies to improve support across the DON Enterprise. - Review and Update the Verification, Validation and Accreditation (VV&A) policy and guidance. - Educate the M&S workforce on use of M&S to support efficient and interoperable RDT&E. - Provide VV&A, Standards and M&S support to programs, PEOs and other DON activities. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 will support workforce training and education in efficient use of Live-Virtual-Constructive environments and VV&A of large-scale complex simulations.					
Title: COMMUNITY SERVICES ***Articles:*** ***Description:*** This activity provides M&S subject matter expert support embedded in the Navy M&S Communities to recommend implementations for M&S policies and standards within their Community and to ensure that the wider DON is aware of the M&S products and services, initiatives, processes, and standards (visibility). It promotes M&S reuse through cooperative Community M&S activities which identify and prioritize M&S capability requirements between and across Communities. It also provides an M&S degree program through the Naval Postgraduate School (NPS), Modeling Virtual Environments and Simulation (MOVES) curriculum which qualifies officers to fill 6202-P coded billets. Financial support for thesis and dissertation efforts	1.219 -	1.308 -	1.737 -	0.000 -	1.737 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0308601N / *Modeling & Simulation Support*	**Project (Number/Name)** 2222 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
done by the students is covered by this funding. Topics are broad M&S topics of concern which are prioritized based on how they meet the requirements across, between and within the M&S Communities. ***FY 2018 Plans:*** - Develop open standards and architectures for M&S Communities' use which will foster Virtual Environments and M&S Enterprise Solutions. - Consolidate investment requirements of the M&S Communities to identify common or similar gaps and develop common solutions. - Develop DON Officer M&S postgraduate Knowledge requirements and submit to the M&S program at Naval Postgraduate School. - Fund DON M&S Forum tasks to share M&S efforts, Best Practices, and lessons learned. ***FY 2019 Base Plans:*** - Develop open standards and architectures for M&S Communities' use which will foster Virtual Environments and M&S Enterprise Solutions. - Consolidate investment requirements of the M&S Communities to identify common or similar gaps and develop common solutions. - Develop DON Officer M&S postgraduate Knowledge requirements and submit to the M&S program at Naval Postgraduate School. - Fund DON M&S Forum tasks to share M&S efforts, Best Practices, and lessons learned. - Coordinate M&S workforce education across DON. - Train and educate workforce in efficient use of Live-Virtual-Constructive environments and VV&A of large-scale complex simulations. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from FY 2018 to FY 2019 will be used to develop, promulgate and employ Set Based Design methodologies, standards and tools across multiple Domains and Communities. It will also be used to develop Common Development Environment capabilities to integrate M&S tools and improve connectivity across DON Warfare Centers, Labs, and facilities.					
Title: COMMUNITY EXPERIMENTS and PROTOTYPES	2.382	2.930	4.328	0.000	4.328
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0308601N / *Modeling & Simulation Support*	**Project (Number/Name)** 2222 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: This activity conducts experiments and prototypes aimed at determining the feasibility and applicability of proposed standards or technical approaches to Navy M&S, and investigate Service-unique requirements for standards or guidance. Individual efforts focus on developing or evaluating approaches to optimize training, assessments and acquisition functional, mission objectives through more efficient development and use of M&S. This activity develops methodologies and standards that will result in model and data reusability and interoperability through the formulation of a technical framework. These standards support the full range of architecture and engineering design requirements across the Navy. This activity also supports Fleet exercises and experiments through the application of distributed simulations across a wide variety of warfighting and supporting communities. Specifically, it develops and integrates appropriate M&S into Fleet Synthetic Training (FST), and develops simulation efforts to test and evolve the standards for models, interfaces, and data. It supports development of tools necessary to enable the seamless access and use of operationally relevant M&S products to support Navy training, warfare assessments and acquisition requirements. ***FY 2018 Plans:*** - Advance and efficiently integrate leading edge M&S capabilities in response to complex emerging threats and future warfighting environments. - Promulgate M&S Best Practices and Common Tools across DON M&S Enterprise.. - Establish enterprise open architectures and standards. - Identify core models,simulations and data requiring integration. - Improve M&S networking environments to ensure labs, facilities, models, simulations, and data are persistently connectable. - Validate scenario, simulation, and threat environments that can be reused across domains and throughout the program life-cycles. ***FY 2019 Base Plans:*** - Advance and efficiently integrate leading edge M&S capabilities in response to complex emerging threats and future warfighting environments. - Provide a comprehensive set of M&S capabilities and tools to support analysis, engineering, prototyping , testing, experimentation, and training to assess and address mission capability gaps and enhance interoperability. - Establish enterprise open architectures and standards. - Identify core models and simulations requiring integration.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0308601N / *Modeling & Simulation Support*	**Project (Number/Name)** 2222 / *Modeling & Simulation*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Improve M&S networking environments to ensure labs and facilities are persistently connectable. - Validate scenario, simulation, and threat environments that can be reused across domains and throughout the program life-cycles. - Initiate development of a Common M&S Environment - Development of standards, architectures and open interfaces will add a new focus on integrating Live Navy Aircraft/Ship/Subs/Networks with Virtual simulations and Constructive models as well cyber effects in the battlespace. - Develop M&S modules in the Naval Integrated Capabilities database that will capture current DON Core Models, Simulations, and Data. Create an accessible repository of models, standards, relevant guidance and policy that will drive down cost. Develop a technical plan for incorporation of the Architecture Management Integration Environment and persistent connectivity across Navy M&S capabilities that will enable reuse and improved response time for LVC events. - Develop reusable M&S technologies in FY19 will add the integration of the Complex threat models (ITASE, DIADs, NGTS and TMAP models) in partnership with Intelligence Centers to create a high fidelity agile threat environment reusable across programs, domains (Air, Sea, Surface, Subsurface) and communities (Analysis, Acquisition, Training and Experimentation). -Experiments, model development efforts and simulation prototypes will include cyber effects modeling, virtualization methodologies for complex tactical code and improved visualization/virtual reality to support next generation M&S supporting emergent Naval warfighting requirements. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The funding increase from FY 2018 to FY 2019 supports investments that are required to implement standards and solutions across DON to establish foundational elements for a Navy Enterprise M&S Environment. These investments are required to implement standards and solutions across DON to reduce the development of duplicate point source proprietary solutions that are not common or reusable so DON can efficiently and effectively conduct system-of-system analysis, testing, and training in an affordable and reusable construct.					
Accomplishments/Planned Programs Subtotals	4.529	5.238	7.097	0.000	7.097

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 / 7	**R-1 Program Element (Number/Name)** PE 0308601N / *Modeling & Simulation Support*	**Project (Number/Name)** 2222 / *Modeling & Simulation*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

This is a non-ACAT program. The focus of the Navy Modeling and Simulation (M&S) Office is to facilitate and enable the efficient use of M&S by minimizing duplication of M&S efforts and maximize the reuse of M&S and data.

E. Performance Metrics

This program supports efforts to define, develop, and utilize M&S technologies, standards and techniques in DON and joint programs across a wide range of disciplines and technical arenas. As such, performance metrics are specific to individual projects initiated under this program element. Representative examples of performance criteria for M&S support include the following: VV&A of deployed M&S systems to support Fleet and Force missions and assessments; degree of composability and adaptability of system architectures employed M&S systems; ability of M&S systems to replicate and permit recreation of force or system interactions that otherwise would be performed by more labor-intensive or expensive personnel, forces, or elements; degree to which M&S frameworks would permit rapid integration and employment of analytic capabilities for the analysis and documentationof warfighter missions, weapons systems or Tactics, Techniques and Procedures (TT&P); and ability od a specific M&S technology or technique to meet the requirements specified in an individual project supported by this program.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0308601N / *Modeling & Simulation Support*	Project (Number/Name) 2222 / *Modeling & Simulation*	

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
DoD Support	WR	SPAWAR : Charleston, SC	0.383	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
NMSO Director	WR	SPAWAR : Charleston, SC	1.559	0.266	Jan 2017	0.282	Jan 2018	0.299	Jan 2019	-		0.299	0.000	2.406	-
NMSO Data Archiving Effort	WR	NAVAIR : Pax River, MD	0.503	0.000		0.000		0.000		-		0.000	0.000	0.503	-
DREN Connectivity	WR	SPAWAR : Charleston, SC	0.043	0.000		0.000		0.000		-		0.000	0.000	0.043	-
M & S Data Lead	WR	SPAWAR : Charleston, SC	0.740	0.000		0.000		0.000		-		0.000	0.000	0.740	-
NMSIS Web Presence	WR	SPAWAR : Charleston, SC	0.896	0.000		0.000		0.000		-		0.000	0.000	0.896	-
VV&A Standards & Support	WR	NAVAIR : Pax River	1.335	0.232	Mar 2017	0.251	Mar 2018	0.266	Mar 2019	-		0.266	0.000	2.084	-
Plans & Policies	WR	SPAWAR : Charleston, SC	1.868	0.000		0.467	Oct 2017	0.466	Oct 2018	-		0.466	0.000	2.801	-
DON Mission Level Gap Analysis	WR	NAVAIR : Pax River, MD	1.100	0.000		0.000		0.000		-		0.000	0.000	1.100	-
M&S Interopeperability Initiative	WR	NAVAIR : Pax River, MD	0.950	0.000		0.000		0.000		-		0.000	0.000	0.950	-
M&S Interopeperability Initiative	WR	SPAWAR : Charleston, SC	0.649	0.000		0.000		0.000		-		0.000	0.000	0.649	-
Navy Training Test Harness	WR	NAWC TSD : Orlando, FL	0.375	0.000		0.000		0.000		-		0.000	0.000	0.375	-
CSP for NTI	WR	NAWC TSD : Olando, FL	0.247	0.000		0.000		0.000		-		0.000	0.000	0.247	-
Navy STORM	MIPR	NAWC : Pax River, MD	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-
USMC STORM	MIPR	USAF : Triangle, VA	0.250	0.250	Mar 2017	0.000		0.000		-		0.000	0.000	0.500	-
M&S Services	WR	SPAWAR : Charleston, SC	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 / 7	R-1 Program Element (Number/Name) PE 0308601N / *Modeling & Simulation Support*	Project (Number/Name) 2222 / *Modeling & Simulation*	

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
Data Assistant	WR	SPAWAR : Charleston, SC	0.918	0.000		0.000		0.000		-		0.000	0.000	0.918	-
Navy VV&A Lead	WR	NAVAIR : Pax River, MD	0.428	0.000		0.000		0.000		-		0.000	0.000	0.428	-
Enterprise Level SBD M&S Components	WR	Various Wafare Centers : Not Specified	0.000	0.814	Oct 2016	0.494	Oct 2017	0.865	Oct 2018	-		0.865	0.000	2.173	-
LDUVV SBD Implementation Net-Centric Systems Test	WR	Various Wafare Centers : Not Specified	0.000	0.430	Oct 2016	0.000		0.000		-		0.000	0.000	0.430	-
Net-Centric Systems Test Evaluation Capability Module -NECM	WR	NAVAIR : Pax River, MD	0.000	0.142	Oct 2016	0.150	Oct 2017	0.150	Oct 2018	-		0.150	0.000	0.442	-
Common Development Environment	WR	NAVAIR : Pax River, MD	0.000	0.519	Oct 2016	0.495	Oct 2017	0.731	Oct 2018	-		0.731	0.000	1.745	-
Architecture Framework	WR	NAVAIR : Pax River, MD	0.000	0.200	Oct 2016	0.212	Oct 2017	0.212	Oct 2018	-		0.212	0.000	0.624	-
MBSE SYSML Reference Architecture Standard	WR	Various Wafare Centers : Not Specified	0.000	0.000		0.212	Oct 2017	0.212	Oct 2018	-		0.212	0.000	0.424	-
AMIE - Architecture Management Integration Environment	WR	NAVAIR : Pax River, MD	2.159	0.302	Feb 2017	0.205	Feb 2018	0.200	Feb 2019	-		0.200	0.000	2.866	-
M&S Integration Analysis	WR	Various Wafare Centers : Not Specified	0.000	0.000		0.159	Oct 2017	0.159	Oct 2018	-		0.159	0.000	0.318	-
Common Development Enviroment Integration	WR	Various Wafare Centers : Not Specified	0.000	0.000		0.000		0.108	Oct 2018	-		0.108	0.000	0.108	-
Architecture Integration	WR	Various Wafare Centers : Not Specified	0.000	0.000		0.318	Oct 2017	0.742	Oct 2018	-		0.742	0.000	1.060	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0308601N / *Modeling & Simulation Support*	Project (Number/Name) 2222 / *Modeling & Simulation*	

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
NAVAL - LIFT	WR	Various Wafare Centers : Not Specified	0.000	0.000		0.212	Oct 2017	0.367	Oct 2018	-		0.367	0.000	0.579	-
M&S Visulation	WR	Various Wafare Centers : Not Specified	0.000	0.000		0.212	Oct 2017	0.318	Oct 2018	-		0.318	0.000	0.530	-
		Subtotal	14.903	3.155		3.669		5.095		-		5.095	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
RDA POC	WR	NAVAIR : Pax River, MD	1.349	0.189	Jan 2017	0.358	Jan 2018	0.380	Jan 2019	-		0.380	0.000	2.276	-
RDA IDS (#1&3)	WR	Various Wafare Centers : Not Specified	1.710	0.353	Jan 2017	0.227	Jan 2018	0.238	Jan 2019	-		0.238	0.000	2.528	-
Training IDS (#1)	WR	Various Wafare Centers : Not Specified	1.401	0.214	Mar 2017	0.231	Mar 2018	0.246	Mar 2019	-		0.246	0.000	2.092	-
Training IDS (#2)	WR	SPAWAR : Charleston, SC	0.951	0.000		0.000		0.000		-		0.000	0.000	0.951	-
Analysis IDS (#1)	WR	SPAWAR : Charleston, SC	0.000	0.000		0.000		0.233	Mar 2019	-		0.233	0.000	0.233	-
Analysis IDS (#2)	WR	SPAWAR : Charleston, SC	0.058	0.000		0.000		0.000		-		0.000	0.000	0.058	-
IDS Training and Coordination	WR	SPAWAR : Charleston, SC	0.044	0.000		0.000		0.000		-		0.000	0.000	0.044	-
USMC IDS	WR	MCCDC : Quantico, VA	0.670	0.000		0.000		0.000		-		0.000	0.000	0.670	-
MOVES	WR	NPS : Monterrey, CA	3.974	0.300	Jan 2017	0.314	Jan 2018	0.318	Jan 2019	-		0.318	0.000	4.906	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0308601N / *Modeling & Simulation Support*	Project (Number/Name) 2222 / *Modeling & Simulation*	

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
RDA M&S Forum	WR	NAVAIR : Pax River, MD	2.201	0.163	Jan 2017	0.174	Jan 2018	0.173	Jan 2019	-		0.173	0.000	2.711	-
NMSO Technical Support	WR	SPAWAR : Charleston, SC	0.483	0.000		0.000		0.000		-		0.000	0.000	0.483	-
Simulated Shipboard FMVS	WR	NWDC : Norfolk, VA	0.365	0.000		0.000		0.000		-		0.000	0.000	0.365	-
M&S Officer Postgraduate Ed	WR	SPAWAR : SSC-LANT	0.852	0.000		0.000		0.000		-		0.000	0.000	0.852	-
M&S Workforce Coordinator	WR	SPAWAR : SSC-PAX	0.000	0.000		0.000		0.149	Oct 2018	-		0.149	0.000	0.149	-
		Subtotal	14.058	1.219		1.304		1.737		-		1.737	0.000	18.318	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
Standard Interfaces for Virtual World	WR	NAVAIR : Pax River, MD	2.347	0.155	Feb 2017	0.265	Feb 2018	0.265	Feb 2019	-		0.265	0.000	3.032	-
Semantic and Structural Metedata Schema	WR	NAVAIR : Pax River, MD	0.562	0.000		0.000		0.000		-		0.000	0.000	0.562	-
Semantic and Structural Metedata Schema	WR	SPAWAR : Charleston, SC	0.289	0.000		0.000		0.000		-		0.000	0.000	0.289	-
Tactical Operational Software Environment (TOSEE)	WR	NAVAIR : TSD, Orlando	0.650	0.000		0.000		0.000		-		0.000	0.000	0.650	-
Cross Cultural Competence in OPS Environment	WR	NAVAIR : TSD, Orlando	0.350	0.000		0.000		0.000		-		0.000	0.000	0.350	-
Framework for Assessing Cost and Technology (FACT)	WR	MCCDC : Quantico, VA	0.500	0.000		0.000		0.000		-		0.000	0.000	0.500	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0308601N / *Modeling & Simulation Support*	Project (Number/Name) 2222 / *Modeling & Simulation*	

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
Intergrated Air/Missle Defense IAMD	WR	NAVAIR : Pax River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Measuring Immersion Training	WR	MCCDC : Quantico, VA	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
VVA of Real Time Propagation Loss Model	WR	ONR : Arlington, VA	0.588	0.000		0.000		0.000		-		0.000	0.000	0.588	-
Navy M&S Education Program	WR	NAVAIR : Pax River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Sensor Federate	WR	ONR : Pax River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Contracting Language for M&S	WR	NAVAIR : Pax River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
VCE for CPD&T	MIPR	WHS : Arlington, VA	0.300	0.000		0.000		0.000		-		0.000	0.000	0.300	-
Navy VV&A Lead	WR	NAVAIR : Pax River, MD	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
LVC Training Enviroment Tech Advisor	WR	NAVSEA JHU : Wash. DC	0.567	0.000		0.000		0.000		-		0.000	0.000	0.567	-
Human Anatomy Motion Tracking & Display	WR	MARCORSYSCOM : Arlington, VA	0.091	0.000		0.000		0.000		-		0.000	0.000	0.091	-
CapabilityModule Enhancement	WR	NAVAIR : Pax River	0.120	0.000		0.000		0.000		-		0.000	0.000	0.120	-
		Subtotal	6.364	0.155		0.265		0.265		-		0.265	0.000	7.049	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	35.325	4.529		5.238		7.097		-		7.097	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0308601N / *Modeling & Simulation Support*	**Project (Number/Name)** 2222 / *Modeling & Simulation*

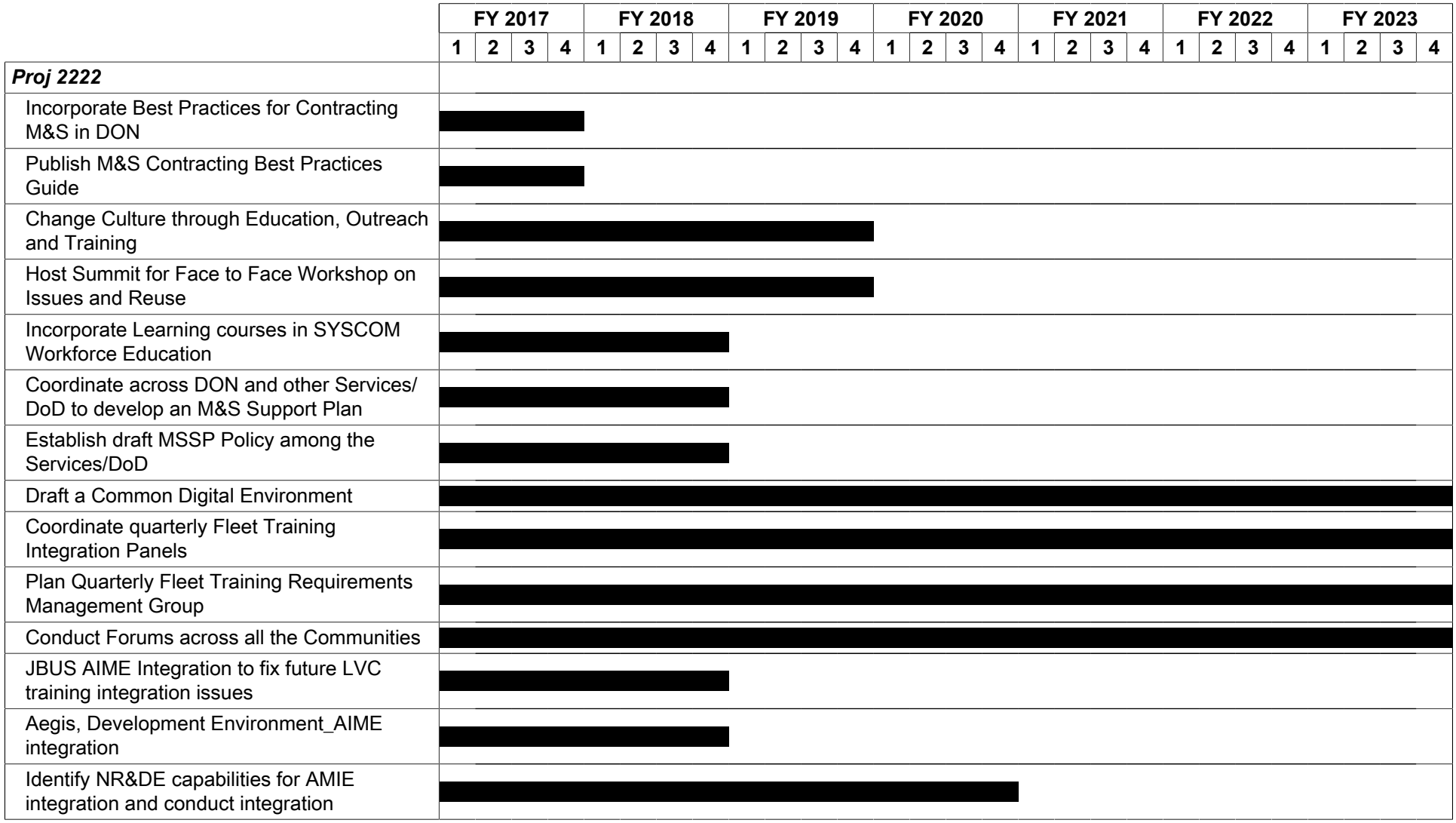


Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0308601N / *Modeling & Simulation Support*	**Project (Number/Name)** 2222 / *Modeling & Simulation*

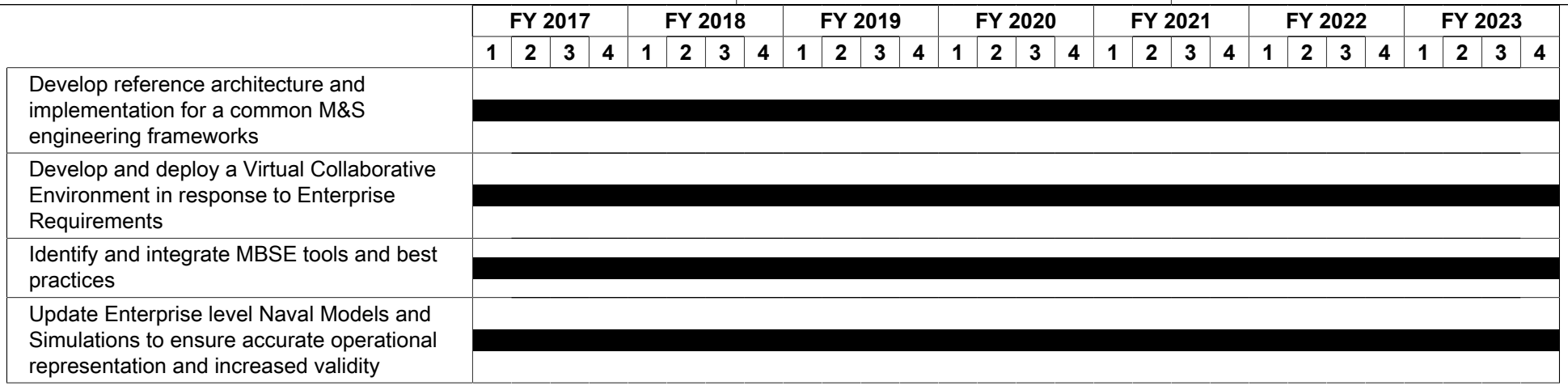


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0308601N / *Modeling & Simulation Support*	**Project (Number/Name)** 2222 / *Modeling & Simulation*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2222				
Incorporate Best Practices for Contracting M&S in DON	1	2017	4	2017
Publish M&S Contracting Best Practices Guide	1	2017	4	2017
Change Culture through Education, Outreach and Training	1	2017	4	2019
Host Summit for Face to Face Workshop on Issues and Reuse	1	2017	4	2019
Incorporate Learning courses in SYSCOM Workforce Education	1	2017	4	2018
Coordinate across DON and other Services/DoD to develop an M&S Support Plan	1	2017	4	2018
Establish draft MSSP Policy among the Services/DoD	1	2017	4	2018
Draft a Common Digital Environment	1	2017	4	2023
Coordinate quarterly Fleet Training Integration Panels	1	2017	4	2023
Plan Quarterly Fleet Training Requirements Management Group	1	2017	4	2023
Conduct Forums across all the Communities	1	2017	4	2023
JBUS AIME Integration to fix future LVC training integration issues	1	2017	4	2018
Aegis, Development Environment_AIME integration	1	2017	4	2018
Identify NR&DE capabilities for AMIE integration and conduct integration	1	2017	4	2020
Develop reference architecture and implementation for a common M&S engineering frameworks	1	2017	4	2023
Develop and deploy a Virtual Collaborative Environment in response to Enterprise Requirements	1	2017	4	2023
Identify and integrate MBSE tools and best practices	1	2017	4	2023
Update Enterprise level Naval Models and Simulations to ensure accurate operational representation and increased validity	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* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0702207N / *Depot Maintenance (NON-IF)*							
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	197.760	37.089	38.227	36.560	-	36.560	41.525	32.521	21.061	15.706	Continuing	Continuing
3030: *FA-18 SLAP*	171.755	37.089	26.879	24.334	-	24.334	24.686	18.597	10.252	10.390	Continuing	Continuing
3182: *T-45 SLAP*	26.005	0.000	0.000	5.400	-	5.400	6.700	6.800	5.600	0.000	0.000	50.505
3384: *MH-60 SLAP*	0.000	0.000	11.348	6.826	-	6.826	10.139	7.124	5.209	5.316	Continuing	Continuing

A. Mission Description and Budget Item Justification

3030: A significant portion of the F/A-18 airframe is believed to have additional inherent capability and a life extension may be possible for many portions of the airframe. The F/A-18 Service Life Assessment Program (SLAP) is assessing the structural and subsystem conditions of the F/A-18 fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to allow it to achieve Chief of Naval Operations inventory requirements. Without SLAP and the follow on Service Life Extension Program, aircraft are retired from the USN inventory when a design service life metric is reached. RDTE funds will support aircraft teardown to validate SLAP analysis, identify unknown fatigue areas and assess the aircraft's material condition.

3182: The T-45 aircraft structure is currently fatigue limited to 14,400 flight hours based on initial full-scale fatigue tests. This service life limit prevents the T-45 fleet from meeting Integrated Production Plan (IPP) past 2025. Studies demonstrate that the 14,400 flight hour service life can be extended, with a Service Life Extension Program (SLEP), to 21,600 flight hours, which will support meeting IPP until 2035. A T-45 Structural Service Life Assessment Program (SLAP) was completed in February 2012. In order for the T-45 to meet IPP until 2035, it is also necessary to assess the subsystems of the T-45 in their ability to remain viable.
In FY13 an initial subsystem assessment, based on the updated fleet aircraft usage spectrum and future predicted training missions of the T-45 aircraft, found 79 dispositions requiring further analysis, teardowns, age explorations, recertification and/or testing . The assessment of the subsystems that make up these 79 dispositions will address all critical subsystems required and their ability to maintain IPP/NTR until 2035, analysis and studies will be conducted to outline improvements, assess manufacturing capabilities, prototype redesign and test of subsystems for trainer aircraft.

3384: The MH-60 SLAP is assessing the primary aircraft structure and subsystem condition of the MH-60S fleet in order to determine what efforts are necessary to extend the aircraft design life limits to allow it to meet Chief of Naval Operations operational inventory requirements through FY 2035. Without SLAP, aircraft are retired from the USN inventory when design service life limits are reached directly impacting fleet surface warfare, mine countermeasures, search and rescue, and vertical replenishment operational capabilities. FY 2018 budget request funds for the completion of external loads analysis, continuation of fatigue analysis, service life risk assessments of aircraft subsystems analysis and development of initial dispositions for safety critical items.

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.

The FY 2017 funding for MH-60 SLAP was a Congressional Directed Reduction.

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0702207N *I Depot Maintenance (NON-IF)*

The FY 2019 funding request was reduced by $3.225 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	49.322	38.227	35.385	-	35.385
Current President's Budget	37.089	38.227	36.560	-	36.560
Total Adjustments	-12.233	0.000	1.175	-	1.175
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.188	0.000			
• Program Adjustments	0.000	0.000	0.311	-	0.311
• Rate/Misc Adjustments	0.000	0.000	0.864	-	0.864
• Congressional Directed Reductions Adjustments	-11.045	-	-	-	-

Change Summary Explanation

Technical: PU 3182: Increase from FY2018 to FY2019 due to the T-45 SLAP Aviation Technical Corrections.

Schedule:

PU 3182: Changes support product development beginning in FY19 for Subsystem SLAP C to include teardown, inspection, detailed analysis and recertification testing required to safely extend the service life of critical subsystems.

PU 3384: MH-60 SLAP delayed due to Congressional Directed Reduction.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0702207N / *Depot Maintenance (NON-IF)*	Project (Number/Name) 3030 / *FA-18 SLAP*	

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
3030: *FA-18 SLAP*	171.755	37.089	26.879	24.334	-	24.334	24.686	18.597	10.252	10.390	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The F/A-18 and EA-18G Service Life Assessment Program (SLAP) is assessing the structural and subsystem conditions of the F/A-18 fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to allow it to achieve Chief of Naval Operations (CNO) inventory requirements. The goal of the F/A-18 SLAP program is to identify critical structures and components that can achieve the extended service life limit goals. SLAP consists of structural investigations of the main landing gear, arresting hook and catapult back-up structures, vertical tails, wings and fuselage. A second effort is to evaluate the subsystem components (hydraulics, wiring, actuators, etc) to identify over and above inspections, overhaul intervals or replacement schedules to fly past design life limits. The current life limits for the F/A-18 E/F are 6,000 Flight Hours (FH), 2,250 catapults/arrestments (Cat/Traps) and 15,750 total landings. The F/A-18 SLAP program of record states the SLAP goals as 12,000 FH, 3,500 Cat/Traps and 22,500 total landings. The primary objective of F/A-18 SLAP is to determine if the stated SLAP goals are feasible. An increase in total landings and flight hours would allow the F/A-18 to meet CNO inventory requirements. The requirements are integrated with the Joint Strike Fighter planned introduction. This effort is required to be conducted for these airframes and subsystems to ascertain what actions and modifications must be taken to safely operate each system beyond its designed life until the targeted end of service life.

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 SLAP	37.089	26.879	24.334	0.000	24.334
Articles:	-	-	-	-	-
Description: The current design life limits do not support USN inventory requirements. Funding supports assessing the structural condition of the F/A-18 fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to allow it to achieve CNO inventory requirements.					
FY 2018 Plans: Continue stress analysis of numerous data points to provide exploitation of complete structural fatigue testing with the expectation of extending the current service life of F/A-18E/F and EA-18G from the design limits to the SLAP goals. Locations encompass the forward, center and aft fuselage, inner and outer wings, as well as landing gear. Sonic and Thermal analysis will be performed on numerous structural and composite skin locations to assess elevated temperatures with the expectation of extending the current life of the F/A-18E/F Super Hornet and the EA-18G Growler. Aircraft Teardown assessments continue to be performed to analyze the fatigue and material condition of fleet aircraft to determine what modifications or inspections are required to extend the					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3030 / *FA-18 SLAP*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
current life of the aircraft. Crack growth analysis will be performed to determine recurring requirements to extend the platform beyond its current service life limits. ***FY 2019 Base Plans:*** Continue stress analysis of numerous data points to provide exploitation of complete structural fatigue testing with the expectation of extending the current service life of F/A-18E/F and EA-18G from the design limits to the SLAP goals. Locations encompass the forward, center and aft fuselage, inner and outer wings, as well as landing gear. Sonic and Thermal analysis will be performed on numerous structural and composite skin locations to assess elevated temperatures with the expectation of extending the current life of the F/A-18E/F Super Hornet and the EA-18G Growler. Aircraft Teardown assessments continue to be performed to analyze the fatigue and material condition of fleet aircraft to determine what modifications or inspections are required to extend the current life of the aircraft. Crack growth analysis will be performed to determine recurring requirements to extend the platform beyond its current service life limits. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The FY 2019 funding request was reduced by $2.545 million to account for the availability of prior year execution balances.					
Accomplishments/Planned Programs Subtotals	37.089	26.879	24.334	0.000	24.334

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 020-14)*	45.252	87.424	137.254	-	137.254	137.910	210.756	210.836	296.372	3,134.079	4,294.649

Remarks

D. Acquisition Strategy

The Service Life Assessment Program (SLAP) program employs sole source contracts with Boeing, the aircraft prime manufacturer. SLAP further decomposes program of record goals into smaller discrete steps, developing requirements to extend flight hours (FH) from 6,000 to 9,000 first. These efforts will provide the raw engineering data to develop aircraft modifications to extend total aircraft landings, Cat/Traps, and FH. The F/A-18 and EA-18G SLAP Program consists of two major engineering efforts: the aircraft structural assessment and the aircraft subsystems assessment. Both efforts are broken into multiple phases which develop tools and models,

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3030 / *FA-18 SLAP*

evaluate current aircraft usage, and develop concepts to extend aircraft life to meet CNO objectives. The program will combine exploitation of complete structural fatigue testing and actual fleet usage with the expectation of extending the service life of the F/A-18 aircraft. Conducting F/A-18 SLAP to study the aircraft lifetime will provide a better estimate of aircraft service life and a follow on Service Life Extension Program (SLEP).

E. Performance Metrics

The F/A-18 and EA-18G SLAP provides an assessment of aircraft structure fatigue life as affected by flight maneuver, Cat/Traps and landings, based on actual usage and identifies the efforts required to extend the aircraft life to SLAP goals. During SLAP Structures Phase A (FY08-FY13) tools and modeling necessary to assess usage and fatigue life are developed. During SLAP Structures Phase B (FY11-FY18) specific structural locations which do not meet SLAP goals are identified and evaluated. Subsystem SLAP is also initiated concurrently with Structures Phase (B). A Flight Control Surface SLAP, SLEP retrofit concepts and repairs for deficient locations are developed during SLAP Structures and Sub-Systems Phase C (FY14-FY23). SLAP is followed by the SLEP during which the actual retrofit and repairs are performed under OSIP 020-14 established in FY14.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3030 / *FA-18 SLAP*

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 SLAP F/A-18 E/F	SS/CPFF	Boeing : St. Louis, MO	109.485	33.868	Dec 2016	23.994	Dec 2017	21.456	Dec 2018	-		21.456	Continuing	Continuing	Continuing
Prior Year Prod Dev cost no longer funded in FYDP	SS/CPFF	Boeing : St. Louis, MO	28.775	0.000		0.000		0.000		-		0.000	0.000	28.775	28.775
		Subtotal	138.260	33.868		23.994		21.456		-		21.456	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
SLAP Inventory Model	WR	ONR : Arlington, VA	6.525	0.000		0.000		0.000		-		0.000	0.000	6.525	-
SLAP F/A-18 E/F	WR	NAWCAD : Patuxent River, MD	8.605	0.619	Dec 2016	0.769	Dec 2017	0.739	Dec 2018	-		0.739	Continuing	Continuing	Continuing
SLAP F/A-18 E/F	WR	FRC Southwest : San Diego, CA	6.573	0.922	Dec 2016	0.592	Dec 2017	0.603	Dec 2018	-		0.603	Continuing	Continuing	Continuing
		Subtotal	21.703	1.541		1.361		1.342		-		1.342	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 F/A-18 E/F	WR	NAWCAD : Pax River, MD	0.971	0.157	Dec 2016	0.157	Dec 2017	0.157	Dec 2018	-		0.157	Continuing	Continuing	Continuing
		Subtotal	0.971	0.157		0.157		0.157		-		0.157	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3030 / *FA-18 SLAP*

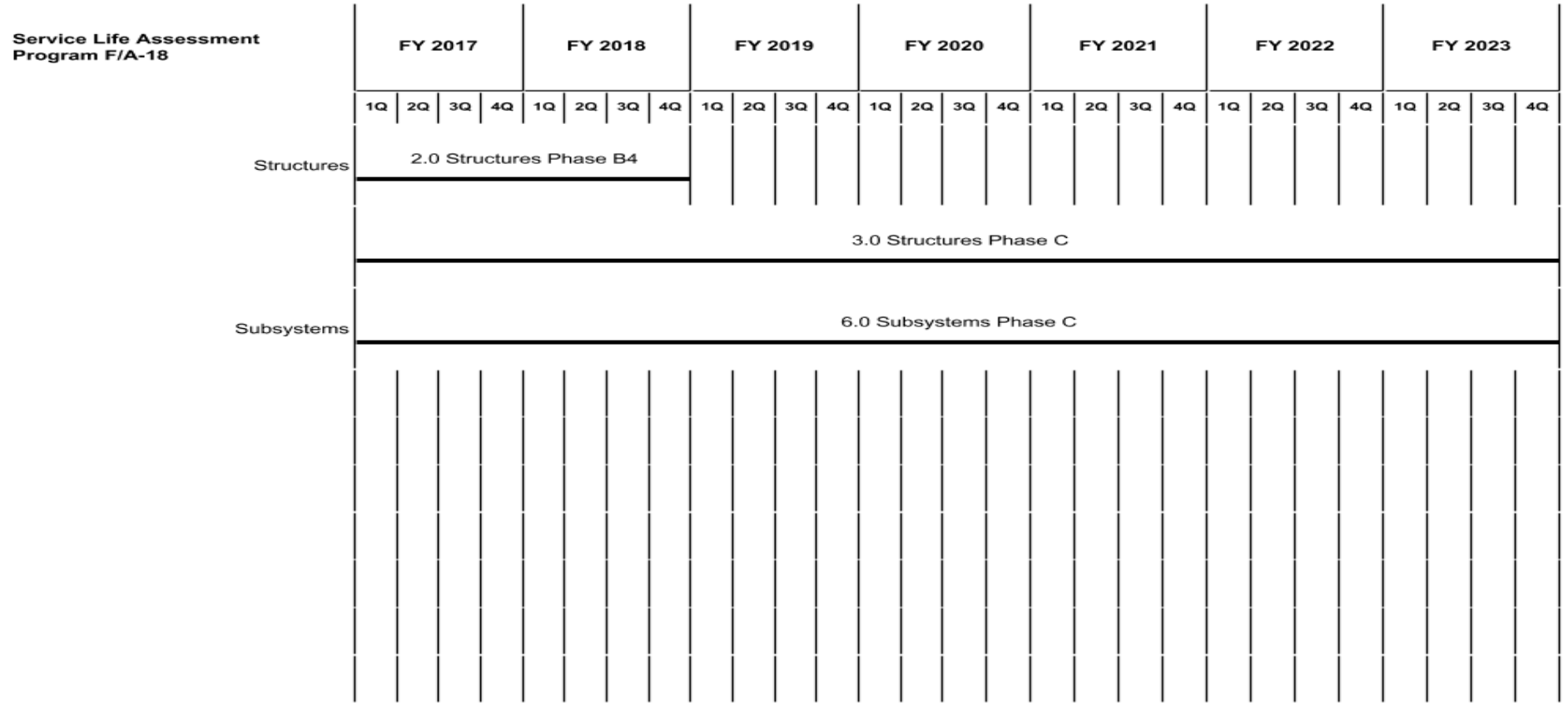
Management Services ($ in Millions)

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 and Technical Support SLAP F/A-18 E/F	WR	NAWCAD : Pax River, MD	4.936	1.018	Dec 2016	1.036	Dec 2017	1.055	Dec 2018	-		1.055	Continuing	Continuing	Continuing
Travel	Various	NAVAIR : Pax River, MD	0.200	0.075	Jun 2017	0.075	Jun 2018	0.075	Jun 2019	-		0.075	Continuing	Continuing	Continuing
Program Management Support (Seaport-CSS)	C/CPFF	WYLE LAB : Pax River, MD	2.667	0.020	Dec 2016	0.050	Dec 2017	0.051	Dec 2018	-		0.051	Continuing	Continuing	Continuing
Program Management Support	Various	NAWCAD : Pax River, MD	2.757	0.040	Dec 2016	0.050	Dec 2017	0.051	Dec 2018	-		0.051	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	Engility : Pax River, MD	0.261	0.370	Dec 2016	0.156	Dec 2017	0.147	Dec 2018	-		0.147	0.000	0.934	0.934
		Subtotal	10.821	1.523		1.367		1.379		-		1.379	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	171.755	37.089		26.879		24.334		-		24.334	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3030 / *FA-18 SLAP*



2019DON - 0702207N - 3030

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3030 / *FA-18 SLAP*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Service Life Assessment Program F/A-18				
Structures: 2.0 Structures Phase B4	1	2017	4	2018
Structures: 3.0 Structures Phase C	1	2017	4	2023
Subsystems: 6.0 Subsystems Phase C	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0702207N / *Depot Maintenance (NON-IF)*	Project (Number/Name) 3182 / *T-45 SLAP*	

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
3182: *T-45 SLAP*	26.005	0.000	0.000	5.400	-	5.400	6.700	6.800	5.600	0.000	0.000	50.505
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The T-45 Service Life Assessment Program (SLAP) is assessing the structural and subsystem conditions of the T-45fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to allow it to achieve Chief of Naval Operations (CNO) inventory requirements. The goal of the T-45 SLAP program is to identify critical structures and components that can extend the aircraft designed service life to support IPP and Naval Flight Officer Training Requirements (NTR) until 2035. This initial subsystem assessment, based on the updated fleet aircraft usage spectrum and future predicted training missions of the T-45 aircraft, found 79 dispositions requiring further analysis, teardowns, age explorations, recertification and/or testing . The assessment of the subsystems that make up these 79 dispositions will address all critical subsystems required and their ability to maintain IPP/NTR until 2035, analysis and studies will be conducted to outline improvements, assess manufacturing capabilities, prototype redesign and test of subsystems for trainer aircraft. The current life limits for the T-45 is 14,400 Flight Hours (FH). The T-45 SLAP program of record states the SLAP goals is 21,600 FH. This effort is required to be conducted for these subsystems to ascertain what actions and modifications must be taken to safely operate each system beyond its designed life until the targeted end of service life.

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-45 SLAP	0.000	0.000	5.400	0.000	5.400
Articles:	-	-	-	-	-
Description: Funding supports development, integration, test, and certification of a Subsystem SLAP to determine modifications necessary to extend service life through 2035.					
FY 2018 Plans: N/A					
FY 2019 Base Plans: Continue Subsystem SLAP activities and engineering studies with the expectation of extending the T-45 service life to 2035.					
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 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3182 / *T-45 SLAP*

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 FY2018 to FY2019 due to the T-45 SLAP Aviation Technical Corrections. Changes support product development beginning in FY19 for Subsystem SLAP C to include teardown, inspection, detailed analysis and recertification testing required to safely extend the service life of critical subsystems.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	5.400	0.000	5.400

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: *T-45 Service Life Ext Prg (SLEP)*	42.479	37.710	33.911	-	33.911	41.445	48.591	47.313	51.441	214.017	614.650

Remarks

D. Acquisition Strategy

The subsystem SLAP is a sole source contract effort with Boeing, the aircraft prime contractor. SLAP consists of an analysis of the aircraft subsystems (e.g., Global Positioning System Inertial Navigation Assembly or Mission Data Processor). The analysis will facilitate the future development of subsystem modifications and/or redesigns necessary to extend their life until 2035.

E. Performance Metrics

SLAP provides an assessment of aircraft component life as affected by flight maneuver, catapults, arrestments, landings, and obsolescence based on actual usage and identifies the efforts required to extend the aircraft life to SLAP goals (2035). Effort delineates tasking incrementally to include; Tools and modeling necessary to assess usage and life are developed, specific designs which do not meet SLAP goals are identified and analyzed. Retrofit concepts and redesigns for problem areas are developed, followed by the Service Life Extension Program during which the actual retrofits are undertaken.SLAP is followed by the Service Life Extension Program (SLEP) during which the actual retrofit and repairs are performed under OSIP 022-14.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0702207N / *Depot Maintenance (NON-IF)*	Project (Number/Name) 3182 / *T-45 SLAP*	

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 SLAP T-45	SS/CPFF	Boeing : St. Louis, MO	12.882	0.000		0.000		4.505	Jan 2019	-		4.505	16.383	33.770	33.770
Product Development SLAP T-45 NACES	C/FFP	Martin Baker : United Kingdom	0.450	0.000		0.000		0.000		-		0.000	0.000	0.450	0.450
		Subtotal	13.332	0.000		0.000		4.505		-		4.505	16.383	34.220	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 Technical Support	WR	NAWCAD : Patuxent River, MD	6.270	0.000		0.000		0.635	Nov 2018	-		0.635	1.929	8.834	-
Engineering Technical Support	WR	NADEP : Jacksonville, FL	2.472	0.000		0.000		0.180	Nov 2018	-		0.180	0.548	3.200	-
Engineering Technical Support	WR	NAWCAD : Various	1.213	0.000		0.000		0.000		-		0.000	0.000	1.213	-
SLAP Engineering Study	SS/BOA	JHU/APL : Laurel, MD	1.969	0.000		0.000		0.000		-		0.000	0.000	1.969	1.969
SLAP ETS Support	SS/BOA	ASI : Virginia Beach, VA	0.267	0.000		0.000		0.000		-		0.000	0.000	0.267	0.267
		Subtotal	12.191	0.000		0.000		0.815		-		0.815	2.477	15.483	N/A

Management Services ($ in Millions)

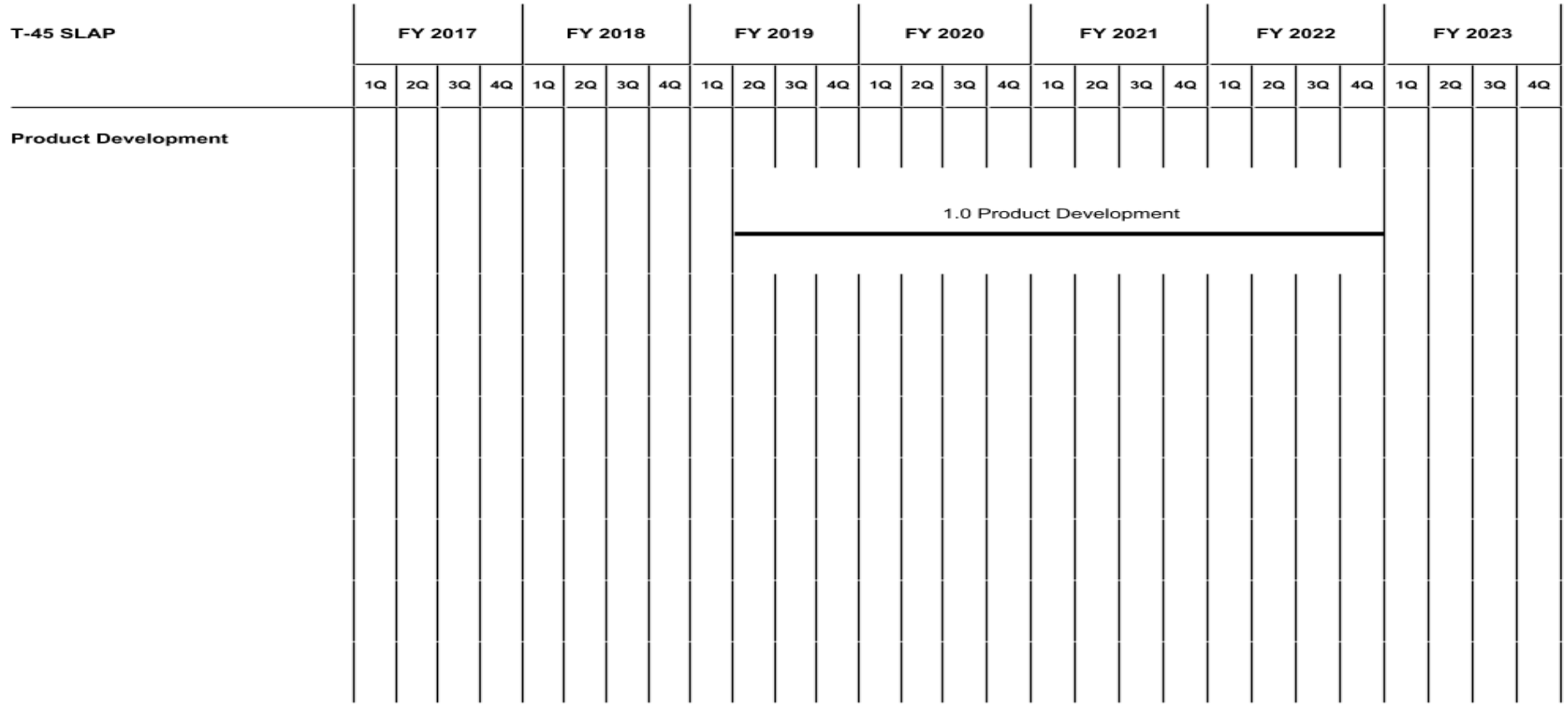
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Travel	Various	NAVAIR : Patuxent River, MD	0.482	0.000		0.000		0.080	Nov 2018	-		0.080	0.240	0.802	-
		Subtotal	0.482	0.000		0.000		0.080		-		0.080	0.240	0.802	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0702207N / *Depot Maintenance (NON-IF)*	Project (Number/Name) 3182 / *T-45 SLAP*	

	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	26.005	0.000		0.000		5.400		-		5.400	19.100	50.505	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3182 / *T-45 SLAP*



2019PB - 0702207N - 3182

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3182 / *T-45 SLAP*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
T-45 SLAP				
Product Development: SLAP T-45C	2	2019	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0702207N / *Depot Maintenance (NON-IF)*	Project (Number/Name) 3384 / *MH-60 SLAP*	

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
3384: *MH-60 SLAP*	0.000	0.000	11.348	6.826	-	6.826	10.139	7.124	5.209	5.316	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

MH-60 SLAP is assessing the primary aircraft structure and subsystem condition of the MH-60S fleet in order to determine what efforts are necessary to extend the aircraft design life limits to allow it to meet Chief of Naval Operations (CNO) operational inventory requirements to bridge to a follow-on program procurement. The highest flight time MH-60S helicopters are expected to exceed the currently assumed design life limit of 10,000 flight hours in 2025, at which time as many as 30 aircraft per year could be downed without a SLAP and Service Life Extension Program (SLEP) established in FY 2018. The MH-60S has experienced significant structural issues since Initial Operational Capability in August 2002, resulting in downed aircraft and additional inspections for the operational fleet. Similar issues could very well precede the 10,000 flight hour life limit, particularly without the insight provided by a SLAP effort commenced as soon as possible. The goal of the MH-60S SLAP program is to identify critical structures, components,
and subsystems that can achieve the extended service life limit goals. The initial efforts of the MH-60S SLAP is to assess the primary aircraft structure and subsystem condition of the MH-60S fleet in order to determine what efforts are necessary to validate the currently assumed design life limit of 10,000 hours and potentially extend the aircraft life limit. The MH-60 SLAP is comprised of two distinct assessments: Fatigue Life Assessment (FLA),which will establish the fatigue life of the aircraft and air vehicle systems and Subsystem Life Assessment (SLA), which will determine subsystem components that are critical to safe flight and ground operations and identify safety risk and risk mitigation strategies for critical components. FLA consists of structural investigations of the cockpit beams, main gearbox beams/frames, upper deck, engine mount, lower tub, main landing gear, tail landing gear, cargo hook, transition splice and tie-down fittings/structure, tailcone, tail gearbox, intermediate gearbox, stabilator, manufactured joints/splices, and flight controls support structure. SLA will evaluate engine start and engine inlet anti-ice, rotor brake, hydraulic, flight controls, avionics components and infrastructure, etc., to identify over-and-above inspections, overhaul intervals or replacement schedules to fly beyond the current design limit assumption.

FY 2018 budget request funds the completion of external loads analysis, continuation of fatigue analysis, service life risk assessments of aircraft subsystems, and development of initial dispositions for safety critical items. This initial analysis, assessment and disposition will be further refined throughout the SLAP effort, augmented with specific system teardown, inspection and test, culminating in a follow-on SLEP, which will design and implement the solutions resulting from the SLAP findings.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: MH-60 SLAP	0.000	11.348	6.826	0.000	6.826
Articles:	-	-	-	-	-
Description: The current design life limits do not support United States Navy inventory requirements to bridge to a follow-on program procurement. Funding supports assessing the structural and subsystem condition of the					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3384 / *MH-60 SLAP*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
MH-60S fleet in order to determine what modifications are necessary to extend the aircraft designed life limits to bridge that gap. ***FY 2018 Plans:*** Collect aircraft historical regime and usage data for assessment, initiate airframe external loads analysis and fatigue analysis, and perform non-destructive tear-down examinations of two (2) aircraft and aircraft components. Perform analytical service life risk assessments of aircraft subsystems, develop initial dispositions for safety critical items. ***FY 2019 Base Plans:*** Continue to collect aircraft historical regime and usage data for assessment, continue airframe external loads analysis and fatigue analysis, and finish non-destructive tear-down examinations of two (2) aircraft and aircraft components. Continue analytical service life risk assessments of aircraft subsystems and the development of initial dispositions for safety critical items. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $4.522M from FY 2018 to FY 2019 is due to the completion of the external loads analysis.					
Accomplishments/Planned Programs Subtotals	0.000	11.348	6.826	0.000	6.826

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The SLAP program employs sole source contracts with Lockheed Martin, the aircraft prime manufacturer, in conjunction with government engineering and logistics expertise at Naval Air Station Patuxent River and the H-60 Fleet Support Team at Cherry Point, NC. Analyses from the SLAP efforts will provide the engineering data necessary to develop aircraft structural, component, and subsystem modifications to extend service life flight hour limits in order to avoid flight line inventory shortfalls. The MH-60S SLAP consists of two major engineering efforts: the FLA and the aircraft SLA. These efforts are broken into multiple phases which develop tools and models, assess current aircraft usage, and develop concepts to extend aircraft life to meet Chief of Naval Operations objectives. The program will combine exploitation

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3384 / *MH-60 SLAP*

of complete aircraft teardown inspections and actual historical fleet usage. Conducting MH-60S SLAP to study the aircraft lifetime will define aircraft service life and is required to determine scope of the future follow-on SLEP.

E. Performance Metrics

The MH-60 SLAP FLA provides an assessment of aircraft structure fatigue life as affected by flight maneuver and Ground-Air-Ground cycles, based on Government furnished usage spectra and identifies the efforts required to extend the aircraft life to SLAP goals. During the FLA External Loads Analysis (FY 2018-2019), external loads for all fatigue conditions are identified from the three usage spectra. During the FLA (FY 2018-FY 2021), the fatigue assessment results and calculated fatigue lives are documented and areas for future improvements to extend the aircraft service life are identified. During the FLA Structural Analysis (FY 2020-FY 2022), static fail-safety analyses of specific airframe sites are conducted to substantiate continued safe flight and identify areas for future service life extensions. Subsystems Phase A utilizes an interdisciplinary team within the USN tasked to develop a methodology for service life assessment of safety critical subsystems. The resulting methodology will be based on a risk-focused approach that evaluates subsystems for potential safety critical failure modes, analyzes the associated hardware for age-related risk factors, and develops data-gathering or risk reduction dispositions. Subsystem SLAP Phase B is initiated concurrently with the FLA. During Subsystems SLAP Phase B (FY 2018-FY 2021), analytical service life risk assessments of aircraft subsystems are conducted and initial dispositions for safety-critical items are developed. During Subsystems SLAP Phase C (FY 2020-FY 2023), dispositions of Phase B are executed by performing component tests, aircraft inspections, and assembly teardowns. Additionally, SLAP assessments are continued on components needing further investigation. Subsystem SLAP Phase C is defined as the execution of the disposition decision resulting from Phase B efforts and will include the performance of component tests, aircraft inspections, component level fatigue analysis, and assembly teardowns. During this Phase, Phase B dispositions will be refined for safety critical components based on new data.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0702207N / *Depot Maintenance (NON-IF)*	Project (Number/Name) 3384 / *MH-60 SLAP*	

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
Fatigue Life Assessment MH-60S	SS/CPFF	Lockheed Martin : Owego, NY	0.000	0.000		3.700	Jan 2018	2.700	Jan 2019	-		2.700	Continuing	Continuing	Continuing
Subsystem Life Assessment MH-60S	SS/CPFF	Lockheed Martin : Owego, NY	0.000	0.000		1.910	Jun 2018	1.700	Jun 2019	-		1.700	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		5.610		4.400		-		4.400	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
SLAP MH-60S	WR	NAWCAD : Patuxent River, MD	0.000	0.000		3.849	Oct 2017	1.443	Dec 2018	-		1.443	Continuing	Continuing	Continuing
SLAP MH-60S	WR	FRC : Various	0.000	0.000		1.445	Oct 2017	0.531	Dec 2018	-		0.531	Continuing	Continuing	Continuing
Eng & Tech Srvc (Non FFRDC)	Various	Various : Various	0.000	0.000		0.103	Oct 2017	0.105	Oct 2018	-		0.105	0.000	0.208	Continuing
		Subtotal	0.000	0.000		5.397		2.079		-		2.079	Continuing	Continuing	N/A

Management Services ($ in Millions)

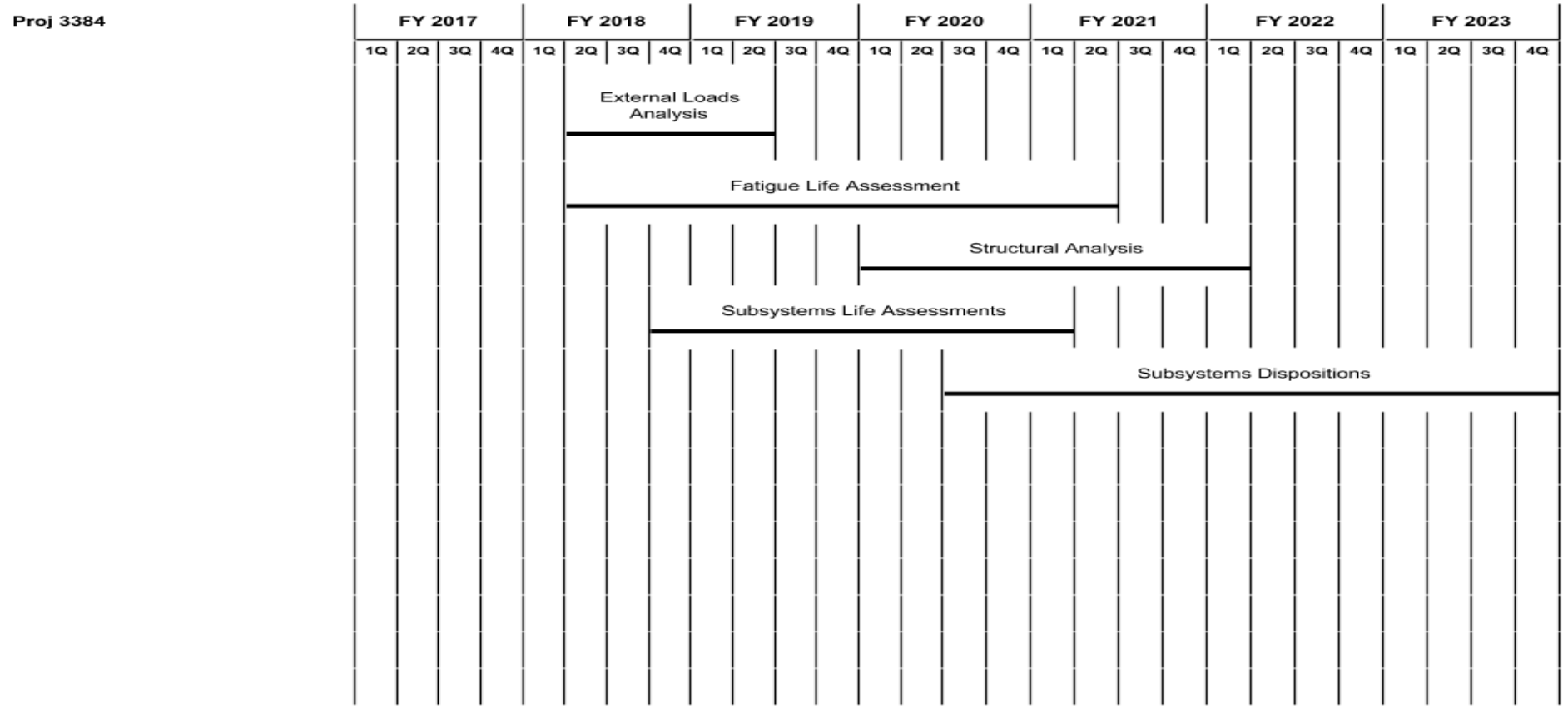
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Support SLAP MH-60S	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.220	Oct 2017	0.224	Dec 2018	-		0.224	Continuing	Continuing	Continuing
Mgmt Supt Services (Non FFRDC)	Various	Various : Various	0.000	0.000		0.103	Oct 2017	0.105	Oct 2018	-		0.105	0.000	0.208	-
Travel	Various	NAVAIR : Patuxent River, MD	0.000	0.000		0.018	Oct 2017	0.018	Oct 2018	-		0.018	0.000	0.036	-
		Subtotal	0.000	0.000		0.341		0.347		-		0.347	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0702207N / *Depot Maintenance (NON-IF)*	Project (Number/Name) 3384 / *MH-60 SLAP*	

	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		11.348		6.826		-		6.826	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3384 / *MH-60 SLAP*



2019OSD - 0702207N - 3384

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0702207N / *Depot Maintenance (NON-IF)*	**Project (Number/Name)** 3384 / *MH-60 SLAP*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3384				
External Loads Analysis	2	2018	2	2019
Fatigue Life Assessment	2	2018	2	2021
Structural Analysis	1	2020	1	2022
Subsystems Life Assessments	4	2018	1	2021
Subsystems Dispositions	3	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0708730N *I Maritime Tech (MARITECH)*							
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	21.511	3.080	4.808	7.284	-	7.284	6.779	7.512	7.664	7.823	Continuing	Continuing
2466: *NSRP ASE*	21.511	3.080	4.808	4.319	-	4.319	3.752	4.421	4.507	4.602	Continuing	Continuing
3435: *Advanced Shipyard Technology*	0.000	0.000	0.000	2.965	-	2.965	3.027	3.091	3.157	3.221	Continuing	Continuing

A. Mission Description and Budget Item Justification

The FY 2019 funding request was reduced by $.005 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 National Shipbuilding Research Program (NSRP) is an industry and enterprise wide research collaboration that seeks to reduce the Navy's shipbuilding and repair cost. The resulting technologies implemented in NSRP-ASE member shipyards, benefit both the shipyard and the US Navy.

The Advanced Shipyard Technology (AST) seeks to improve the productivity, quality, and reduce costs of maintenance performed by the Naval public shipyards. The resulting technologies implemented by this program benefit both the naval shipyard and the US Navy.

B. Program Change Summary ($ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	3.204	4.808	4.373	-	4.373
Current President's Budget	3.080	4.808	7.284	-	7.284
Total Adjustments	-0.124	0.000	2.911	-	2.911
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.124	0.000			
• Program Adjustments	0.000	0.000	2.995	-	2.995
• Rate/Misc Adjustments	0.000	0.000	-0.084	-	-0.084

Change Summary Explanation

The increase to the FY 2019 budget request is due to the start of the Advanced Shipyard Technology effort.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0708730N / *Maritime Tech (MARITECH)*	Project (Number/Name) 2466 / *NSRP ASE*	

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
2466: *NSRP ASE*	21.511	3.080	4.808	4.319	-	4.319	3.752	4.421	4.507	4.602	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

NSRP ASE is a collaboration of U.S. shipyards working with the Navy customer to reduce the cost of building and repairing naval ships and improving shipbuilding industry productivity through advanced technology and processes. NSRP ASE is an innovative and proven approach to public/private cooperation to manage cost-shared R&D based on a national consensus Strategic Investment Plan. The Plan targets potential industry-wide technology and process solutions which are vetted by industry experts and builds upon the progress
made over the previous years. The collaboration's organizational structure promotes teaming of industry, government and academia to achieve the continuous product and process improvements necessary for improved Navy ship affordability. Solutions include both leverage of best commercial practices and creation of industry-wide initiatives with aggressive technology transfer to, and buy-in by, multiple U.S. shipyards. Navy PEOs (Ships, Subs and Carriers) and NAVSEA are directly involved in NSRP. The Plan calls for matching government and industry investments over several 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: Technology Development Projects	3.080	4.808	4.319	0.000	4.319
Articles:	-	-	-	-	-
Description: The NSRP is an ongoing Research and Development program. This program awards small research projects and large research projects to (1) Improve Quality; (2) Reduce Total Ownership Costs; and, (3) Increase Energy Efficiency. These research projects have been known to produce technological advances in shipbuilding that once implemented have resulted in savings for the Navy.					
FY 2018 Plans: (1) Complete technology development projects in the four major initiative areas (Ship Design and Material Technologies, Ship Production Technologies, Business Process and Information Systems, and Infrastructure and Support (Regulatory Compliance, Technology Transfer and Workforce Development)) that will be competitively selected by industry subject matter experts and Navy stakeholders during GFY18, targeting the following priorities in Naval shipbuilding and repair: (1) Improving Quality; (2) Reduction of Total Ownership Costs; and, (3) Increasing Energy Efficiency. It is anticipated that projects selected will continue to be focused in the following areas: - Promotion of Modular Construction - Reduction of Re-work - Improving Production Engineering					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0708730N / *Maritime Tech (MARITECH)*	**Project (Number/Name)** 2466 / *NSRP ASE*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Improving Specifications and Standards - Improving Manufacturing Processes - Improving Production Planning - Data Exchange - Improving Safety & Health / Reducing Environmental Impacts - Education and Training - Total Ownership Cost (2) Continue technology transfer among the Navy, shipbuilding industry, academia, equipment and material suppliers and the R&D community					
FY 2019 Base Plans: (1) Complete technology development projects in the four major initiative areas (Ship Design and Material Technologies, Ship Production Technologies, Business Process and Information Systems, and Infrastructure and Support (Regulatory Compliance, Technology Transfer and Workforce Development)) that will be competitively selected by industry subject matter experts and Navy stakeholders during GFY19, targeting the following priorities in Naval shipbuilding and repair: (1) Improving Quality; (2) Reduction of Total Ownership Costs; and, (3) Increasing Energy Efficiency. It is anticipated that projects selected will continue to be focused in the following areas: - Promotion of Modular Construction - Reduction of Re-work - Improving Production Engineering - Improving Specifications and Standards - Improving Manufacturing Processes - Improving Production Planning - Data Exchange - Improving Safety & Health / Reducing Environmental Impacts - Education and Training - Total Ownership Cost (2) Continue technology transfer among the Navy, shipbuilding industry, academia, equipment and material suppliers and the R&D community					
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 / 7	**R-1 Program Element (Number/Name)** PE 0708730N / *Maritime Tech (MARITECH)*	**Project (Number/Name)** 2466 / *NSRP ASE*

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 from FY 2018 to FY 2019 is result of budget directed reforms for efficiency and effectiveness in addition to rate adjustments.					
Accomplishments/Planned Programs Subtotals	3.080	4.808	4.319	0.000	4.319

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

R&D projects have been solicited and awarded by an industry collaboration represented by the Executive Control Board (ECB) of the National Shipbuilding Research Program (NSRP). The Navy has entered into an agreement with the industry collaboration using "other transaction" authority pursuant to 10 U.S.C. 2371.

E. Performance Metrics

Quarterly reports and reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0708730N / *Maritime Tech (MARITECH)*	Project (Number/Name) 2466 / *NSRP ASE*	

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
Technology Development	Various	ECB NSRP : Not Specified	20.640	3.080	Dec 2016	4.808	Dec 2017	4.319	Dec 2018	-		4.319	Continuing	Continuing	Continuing
		Subtotal	20.640	3.080		4.808		4.319		-		4.319	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
Gov't Support Services	WR	NSWCCD : Not Specified	0.650	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Contractor Support Services	Various	Various : Not Specified	0.221	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
		Subtotal	0.871	0.000		0.000		0.000		-		0.000	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	21.511	3.080		4.808		4.319		-		4.319	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0708730N / *Maritime Tech (MARITECH)*	**Project (Number/Name)** 2466 / *NSRP ASE*

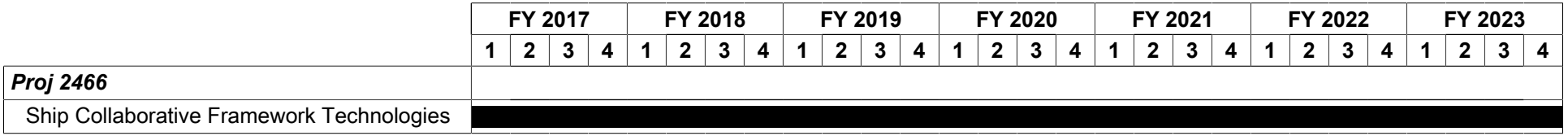


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0708730N / *Maritime Tech (MARITECH)*	**Project (Number/Name)** 2466 / *NSRP ASE*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2466				
Ship Collaborative Framework Technologies	1	2017	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0708730N / *Maritime Tech (MARITECH)*	Project (Number/Name) 3435 / *Advanced Shipyard 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
3435: *Advanced Shipyard Technology*	0.000	0.000	0.000	2.965	-	2.965	3.027	3.091	3.157	3.221	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Advanced Shipyard Technology (AST) develops, matures, and transitions technology (production processes, human augmentation, business process, IT, tooling, etc.), into the naval shipyards. Advanced Shipyard Technology funding will facilitate collaboration between government (Naval Sea Systems Command (NAVSEA), the public naval shipyards, Navy customers, Naval Warfare Centers, and others), academia, and industry. AST is an innovative approach to leverage public/private cooperation and target technology and process solutions that build on progress made over the previous years. Funding ensures widespread adoption of innovative improvements, enhancing proficiency and productivity of the public naval shipyard workforce to achieve the continuous product and process improvements necessary for improved Navy ship repair costs, and an overall reduction in availability duration.

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 Transfer	0.000	0.000	2.965	0.000	2.965
Articles:	-	-	-	-	-
FY 2018 Plans: N/A					
FY 2019 Base Plans: Complete and accelerate technology transfer projects in the four major initiative areas (Predictive Planning, Proficient Workforce Development, Infrastructure-IT and Support, and Shipyard Execution) to deliver ships to the warfighter on time at the best cost. These funds enable "See, Solve, and Sustain" naval shipyard innovations through targeting of projects that deliver improvements in Critical Path Work, and Reduction of Total Ownership Costs (Improve Quality, Safety, and Throughput). Specific projects will be competitively selected by Navy subject matter experts during FY18, targeting the following capabilities in Naval Shipyards: a. Implement accelerated technology transfer and best practices on Shipyard Maintenance among industry, academia, and other DOD Services (e.g. automation, artificial intelligence, virtual reality, augmented reality, and geolocation). b. Accelerate technical approvals on new methods, such as laser ablation and cold spray disruptive technologies.					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0708730N / *Maritime Tech (MARITECH)*	**Project (Number/Name)** 3435 / *Advanced Shipyard Technology*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
c. Establish and Sustain Naval Shipyard Laboratory Operations, Partnerships, and Results. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** The increase from the FY 2018 to FY 2019 budget request was due to the start of the Advanced Shipyard Technology program.					
Accomplishments/Planned Programs Subtotals	0.000	0.000	2.965	0.000	2.965

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Technologies will be developed and fielded based on their level of maturity and measure of benefit to the public naval shipyards.

E. Performance Metrics

Quarterly reports and reviews.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0708730N / *Maritime Tech (MARITECH)*	Project (Number/Name) 3435 / *Advanced Shipyard 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
Technology Development	Various	Various : Locations	0.000	0.000		0.000		2.965	Dec 2018	-		2.965	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		0.000		2.965		-		2.965	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		2.965		-		2.965	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0708730N / *Maritime Tech (MARITECH)*	**Project (Number/Name)** 3435 / *Advanced Shipyard Technology*

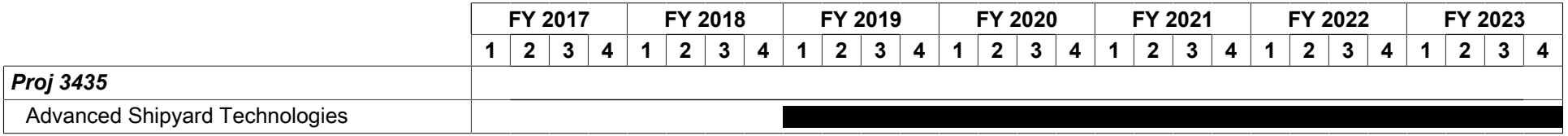


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0708730N / *Maritime Tech (MARITECH)*	**Project (Number/Name)** 3435 / *Advanced Shipyard Technology*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3435				
Advanced Shipyard Technologies	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 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 1203109N *I (U)Satellite Communications (SPACE)*							
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	37.836	39.174	-	39.174	47.333	48.223	52.908	53.996	Continuing	Continuing
0728: *EHF SATCOM Terminals*	0.000	0.000	22.361	17.729	-	17.729	32.801	33.363	38.993	39.809	Continuing	Continuing
2472: *Mobile User Objective Sys (MUOS)*	0.000	0.000	13.965	20.530	-	20.530	14.530	14.860	13.915	14.187	82.590	174.577
3398: *Enterprise SATCOM Gateway Modems (ESGMs)*	0.000	0.000	1.510	0.915	-	0.915	0.002	0.000	0.000	0.000	0.000	2.427

Program MDAP/MAIS Code:
Project MDAP/MAIS Code(s): 290, 345

A. Mission Description and Budget Item Justification

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) program for enhancing protected and survivable satellite communications to Naval forces. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with legacy Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence in support of Assured Command and Control (AC2) initiatives. The NMT system replenishes and improves on Navy terminal capabilities of the Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS) and Global Broadcast Service (GBS). The new system equips the warfighters with the assured, jam resistant, secure communications as described in the joint AEHF satellite communications system and WGS Operational Requirements Documents (ORD). The NMT provides multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

The Navy Global Broadcast Service (GBS) Program is the Navy component of the Joint Military Satellite Communications (MILSATCOM) ACAT IC program that delivers the continuous flow of high-speed, high-volume communication and information flow for deploying, deployed, on the move, and garrisoned forces. The Joint GBS system supports the Navy Strategic Plan and equips warfighters with Assured Command and Control (AC2) communications. The Enterprise SATCOM Gateway Modem (ESGM) is the DoD Chief Information Officer directed solution to satisfy the Transmission Security (TRANSEC) requirement in place of the Joint Internet. Testing and fielding of the ESGM is a joint venture, operationally directed by the Defense Information Systems Agency (DISA) and the Air Force as the lead service. GBS augments and interfaces with other communications systems, provides relief to overburdened communications systems already in place, and provides information to previously unsupported users. GBS provides bandwidth five times any other system, up to 45 Mbps of forward link data (shore to ship) per WGS satellite transponder.

The Mobile User Objective System (MUOS) program provides for the development of the next generation Department of Defense (DoD) advanced narrowband communications satellite constellation. MUOS is the only UHF satellite system replacing the aging UHF Follow-on (UFO) system, which is currently beyond its design

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 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 1203109N *I (U)Satellite Communications (SPACE)*

life. MUOS provides legacy UHF satellite communications as well as a Wideband Code Division Multiple Access (WCDMA) capability which significantly increases performance and capacity critical to support Combatant Command priorities.

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	37.836	35.724	-	35.724
Current President's Budget	0.000	37.836	39.174	-	39.174
Total Adjustments	0.000	0.000	3.450	-	3.450
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	3.764	-	3.764
• Rate/Misc Adjustments	0.000	0.000	-0.314	-	-0.314

Change Summary Explanation

The FY19 adjustment includes a reduction of $1.236M reduction to account for the availability of prior year execution balances; an increase of $5.000M in support of UHF Narrowband SATCOM AoA, and $0.314M for Rate and miscellaneous adjustments.

Schedule:
EHF SATCOM Terminals (Project 0728) - No change

Technical:
EHF SATCOM Terminals (Project 0728): No change

Projects 0728, 2472 and 3398 realigned from PE 0303109N beginning in FY 2018.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*	Project (Number/Name) 0728 / *EHF SATCOM Terminals*	

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
0728: *EHF SATCOM Terminals*	0.000	0.000	22.361	17.729	-	17.729	32.801	33.363	38.993	39.809	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 290

A. Mission Description and Budget Item Justification

The Navy Multiband Terminal (NMT) Program is the required Navy component to the Advanced Extremely High Frequency (AEHF) Program for enhancing protected and survivable satellite communications to Naval forces. Although development of the NMT terminal is complete, software and hardware upgrade development is ongoing to provide enhanced capabilities to the fleet. Development efforts, including Adaptive Coding (AC), Time of Day (TOD), and the Wideband Anti-Jam Modem System (WAMS) augment the baseline NMT system to pace the evolving threats to the warfighter. The NMT system provides an increase in single service capability from 1.5 Megabits per second (Mbps) to 8 Mbps, increases the number of coverage areas, and retains Anti-Jam/Low Probability of Intercept (AJ/LPI) protection characteristics. It is compatible with legacy Navy Low Data Rate/Medium Data Rate (LDR/MDR) terminals and will sustain the Military Satellite Communications (MILSATCOM) architecture by providing connectivity across the spectrum of mission areas, to include land, air and naval warfare, special operations, strategic nuclear operations, strategic defense, theater missile defense, and space operations and intelligence. The NMT system replenishes and improves on Navy Military Strategic, Tactical & Relay System (MILSTAR), Defense Satellite Communications System (DSCS), Wideband Global Satellite (WGS), and Global Broadcast Service (GBS) terminal capabilities. The new system equips the warfighters with assured, jam resistant, secure communications as described in both the joint AEHF Satellite Communications System and the WGS Operational Requirement Documents (ORD). Mission requirements specific to Navy operations, including threat levels and scenarios, are contained in the ORD. The NMT provides multiband Satellite Communications (SATCOM) capability for ship, submarine, and protected MILSATCOM for shore sites.

The Wideband Anti-Jam Modem Systems (WAMS) enhances communication capability of shipboard and submarine NMTs by providing wideband Anti-Jam (AJ) Satellite Communication throughput over Wideband Global SATCOM (WGS). The United States Air Force (USAF) Protected Tactical Enterprise Service (PTES) program will provide the ground hub component of the WAMS communication system. This PTES joint hub will serve as a DoD enterprise service ground solution for the use of the Protected Tactical Waveform (PTW) of SATCOM communications. WAMS enables space segment AJ diversity (EHF/AEHF and WGS), thus enabling NMT ships and submarines equipped with the modem to operate in wideband links closer to threat jammers. WAMS will also include a Mini-Hub component to be fielded on all Force Level platforms to provide operations in the event Shore Communications are eliminated. WAMS enables the use of WGS X and Ka-band resources to assure access to mission critical communications to provide Assured Command and Control (AC2) capabilities in contested/degraded environments, formerly known as Anti-Access/ Area Denial (A2AD). The use of WAMS Protected Tactical Waveform (PTW) on WGS will augment AEHF extended data rate (XDR) services to provide the information throughput capacity necessary to support critical Command and Control capability.

Joint Aerial Layer Network-Maritime (JALN-M) is the Navy implementation of the JALN architecture which provides assured communications in any environment, especially in a satellite denied environment. With disruption or loss of Space tier communications, JALN-M establishes and/or restores connectivity. A critical component of Assured Command and Control (AC2) capabilities is Adaptive Coding (AC) software development incorporation into the baseline NMT terminal

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

including the Advanced Time Division Multiple Access (TDMA) Interface Processor (ATIP) in addition to supporting the JALN-M demonstration. This capability autonomously enhances maximum throughput and supports degraded conditions by adjusting End-to-End code rate to provide continuous, mission critical, and protected communications.

Development efforts, including Adaptive Coding, Time of Day, and the Wideband Anti-Jam Modem System (WAMS) augment the baseline NMT system to pace the evolving threats to the warfighter. The Time of Day (TOD) capability promotes communications reliability and resiliency; when the channel is degraded due to inclement weather or adversarial action. TOD enables the system to automatically transition to a more robust, lower code rate resulting in ability to maintain satellite link thereby allowing the fleet to preserve communications.

Technology Insertion, studies and implementation is necessary for military satellite communications systems development to support emerging technologies for Commercial Broadband Satellite Program (CBSP) and Global Broadcast Service (GBS) Terminals in the out years.

The FY19 request will provide for the continuation of enhancements to the NMT system and to define the Navy's WAMS technical baseline for integration into NMT. NMT enhancements include the completion of both the Adaptive Coding and Time of Day (TOD) software design, development, integration and test.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: NMT Assured C2 Development	0.000	20.154	17.729	0.000	17.729
Articles:	-	-	-	-	-
Description: Software and hardware upgrade development is ongoing to provide Assured Command and Control (AC2) capabilities to pace the evolving threats to the warfighter. These capabilities provide secure SATCOM access in contested/degraded environments by providing anti jam and improved bandwidth that supports increasing Fleet demands. The Wideband Anti-Jam Modem System (WAMS) will provide an anti-jamming capability that will counter various adversary threats and Adaptive Coding (AC) will autonomously maximize throughput in degraded or benign conditions. Adaptive Coding (AC) software development autonomously enhances maximum throughput and supports degraded conditions by adjusting End-to-End code rate to provide continuous, mission critical, and protected communications. The Time of Day (TOD) capability promotes communications reliability and resiliency; when the channel is degraded due to inclimate weather or adversarial action. TOD enables the system to automatically transition to a more robust, lower code rate resulting in ability to maintain satellite link thereby allowing the fleet to preserve communications.					
FY 2018 Plans: Begin major Time of Day (TOD) software design development efforts, which implements a more robust Adaptive Coding (AC) capability on the affected systems NMT, Advanced Time Division Multiple Access (TDMA) Interface Processor (ATIP), and KIV-7M. Raytheon and Comtech vendors supporting NMT, ATIP, and KIV-7M will work					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
parallel Engineering Change Proposals (ECPs) to design and ensure interoperability on development efforts for Adaptive Coding software TOD encryption to enable a more robust, lower code rate when the link margin is degraded. This will ensure ADNS/ATIP interface data rates changes commensurate with code rate changes are optimized to ensure maximum user data throughput. The program will undertake NSA certification of AC TOD encryption. These modifications will allow the ATIP to support TOD for KIV-7M use to prevent crypto losing synchronization during degraded link environment. Start the development of integration and testing plans for the TOD encryption solution and perform technical and system risk reduction. NMT will be conducting Operational Test-E1 to evaluate the operational effectiveness and operational suitability of the Enhanced Polar System (EPS) modified NMT which utilizes the protected high frequency (EHF) satellite communications in the North Polar. In addition, NMT will support Air Force Lead Developmental Test Organization (LDTO) EPS events and EPS Multi-Service Operational Test and Evaluation (MOT&E). Continue development of the WAMS technical baseline for use in NMT and complete Systems Engineering Technical Review (SETR) activities. Develop requirements and NMT specification changes and commence NMT design changes to improve performance when operating with the WAMS. Develop design of the Modem Mission Management System (MMS) and Key Management System (KMS) as well as integration strategies for MMS/KMS operational compatibility with DoD enterprise Protected Tactical Enterprise Service (PTES) (which is the Air Force ground system for waveform operations over the Wideband Global SATCOM (WGS) ground solution architecture. Obtain and certify space assets and ground facilities to support testing and assessment of Engineering Design Model (EDM) modems. Develop test plans and procedures to commence Navy testing of USAF EDM modems after delivery. Testing will include analysis of three separate vendor EDM designs procured from the USAF Protected Tactical Field Service Demonstration (PTSFD) effort. The testing process will verify and validate the vendor designs ensuring that Navy unique performance (antenna handover) and environmental (shock, vibration, temperature, and humidity) requirements are addressed in the design. Further refinement of technical and pre-award acquisition documentation for the Modem and Mini-Hub contracts of the WAMS effort including RFP development and coordination as well as technical specifications. Initiate modem certification and coordination process through NSA. Documentation development will include the WAMS Specification, WAM Mini-Hub specification, Cyber strategy to support the Clinger Cohen Act and Information Support Plan (ISP). ***FY 2019 Base Plans:*** Complete major Time of Day (TOD) software design development efforts on the affected systems, NMT and ATIP, to implement the more robust AC capability. The NMT and ATIP vendors will develop parallel Engineering					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Change Proposals (ECPs) to design and ensure the interoperability of AC software and TOD encryption that will enable a more robust, lower code rate when the link margin is degraded. The program will undertake NSA certification of AC TOD encryption solution and author a Key Management Plan (KMP) to support key generation, distribution and operation of the AC TOD encryption. The ToD encryption functionality will be hosted in the ATIP and allow for continued operations during degraded link environments using lower code rate / data rate without dropping the communications link. The program will develop test plans and execute test events to verify system of systems capability. This includes the development of the network interface of Automated Digital Network System (ADNS) to support a dynamic bandwidth capability on the radio to router interface. This will complete the integration and testing of NMT and ATIP design development as well as development plans for TOD encryption solution and associated technical and system risk reduction. Define the Navy's WAMS technical baseline for integration into NMT. Continue to develop and design the Modem Mission Management System interim (MMSi) and Key Management System interim (KMSi), including integration strategies for MMS/KMS operational compatibility with the DoD Protected Tactical Enterprise Service (PTES) ground solution architecture. This will also include Navy specification development and review of the Air Force Technical Requirements Documents (TRD). Continue Navy testing of both surface and submarine terminal variant EDM WAMS modems in Navy Labs. Testing will verify and validate waveform and system specification compliance and help refine the Navy test plan and schedule which will allow for the coordination of joint Initial Operational Capability (IOC) test events with the Air Force. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $2.425M from FY18 to FY19 is due to Engineering Design Modems (EDM) Hardware procured in FY18 and associated test plan development that is not required in FY19. The FY19 funding request was reduced by $1.236M to account for the availability of prior year execution balances.					
Title: Joint Aerial Layer Network Maritime (JALN-M) ***Articles:*** ***FY 2018 Plans:*** Complete system of systems integration and testing of NMT and ATIP Adaptive Coding during pre-demonstration flights. This includes completion of design verification of JALN-M capabilities of NMT by testing with the Airborne XDR payload. Perform systems engineering, test support and document analytical data and	0.000 -	2.107 -	0.000 -	0.000 -	0.000 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
findings. Complete installation of the JALN-M capabilities and execute shipboard/site verification by using the AEHF satellite for End-to-End SATCOM Adaptive Coding. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of $2.107M from FY18 to FY19 is due to the completion of the JALN-M Demonstration in FY18.					
Title: Technology Insertion ***Articles:*** ***Description:*** Overall program efforts include technology insertion implementation and associated testing required to support satellite communications. ***FY 2018 Plans:*** Perform Joint SATCOM Engineering Center (JSEC) testing and certification of the Assured Command and Control (AC2) modems to prepare for operation in the Wideband Global SATCOM system (WGS) in support of Commercial Broadband Spectrum (CBSP) and Navy Multiband Terminal (NMT) programs. ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Decrease of -0.1 from FY2018 to FY2019 is due to the completion of JSEC testing and certification of the AC2 modems.	0.000 -	0.100 -	0.000 -	0.000 -	0.000 -
Accomplishments/Planned Programs Subtotals	0.000	22.361	17.729	0.000	17.729

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

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/3216: *NAVY MULTIBAND TERMINAL (NMT)*	33.992	69.764	113.885	-	113.885	92.150	21.536	31.279	19.072	73.062	1,508.298

Remarks

The Other Appropriation represents remaining procurement and installation of NMT production units for Afloat and Shore requirements to reach Full Operational Capability. Funding also includes the procurement and installation of Assured Command and Control (AC2) modems as well as the installation of Advanced Time Division Multiple Access (TDMA) Interface Processors (ATIPs), X/KA Back-Fits, and Ashore Antennas.

D. Acquisition Strategy

The NMT Follow-On Full Deployment (FOFD) contract will continue NMT production for Afloat platforms and Shore locations, in support of the Chief of Naval Operations and the Department of the Navy (DON), and will allow the NMT Program to complete Full Operational Capability (FOC). The competitive contract awarded to COMTECH supports the development of Assured Command and Control (AC2) enhancements.

E. Performance Metrics

The RDT&E goal for the NMT program is to create a military satellite communications system that consolidates capabilities of current and future satellite systems into a single terminal.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*	Project (Number/Name) 0728 / *EHF SATCOM Terminals*	

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 Time of Day (TOD)	C/CPAF	RAYTHEON : Marlborough, MA	0.000	0.000		3.140	Dec 2017	2.870	Dec 2018	-		2.870	Continuing	Continuing	Continuing
Software Development ATIP Adaptive Coding (AC) /Time of Day (TOD)	C/CPFF	COMTECH : Tempe, AZ	0.000	0.000		3.756	Dec 2017	2.246	Dec 2018	-		2.246	Continuing	Continuing	Continuing
Software Development Engineering	C/CPFF	NUWC : Newport, RI	0.000	0.000		3.062	Jan 2018	3.598	Jan 2019	-		3.598	Continuing	Continuing	Continuing
Software Development Engineering	WR	SSC PAC : San Diego, CA	0.000	0.000		0.581	Jan 2018	0.490	Jan 2019	-		0.490	Continuing	Continuing	Continuing
WAMS EDM Hardware	C/CPIF	RATYTHEON : Marlborough, MA	0.000	0.000		0.550	Jan 2018	0.000		-		0.000	0.000	0.550	-
WAMS EDM Hardware	C/CPIF	L3 Systems West: : Salt Lake City, UT	0.000	0.000		0.485	Jan 2018	0.000		-		0.000	0.000	0.485	-
WAMS EDM Hardware	C/CPIF	ViaSat : Carlsbad, CA	0.000	0.000		0.317	Jan 2018	0.000		-		0.000	0.000	0.317	-
		Subtotal	0.000	0.000		11.891		9.204		-		9.204	Continuing	Continuing	N/A

Remarks

FY19 Increase to Software Development Engineering and the continuation of efforts within the NMT Product Development focuses on the completion of software design development across systems and vendors for Adaptive Coding (AC) and Time of Day (TOD) Encryption and finalize development of WAMS technical baseline. The program will perform Navy testing of the PTSFD EDM modems to verify and validate waveform and specification compliance. FY18 Software Development TOD Plan is a program directed update and aligns funds from Raytheon to COMTECH. FY18 funding assigned to WAMS EDM Hardware Contracts due to delayed Air Force contract negotiations. FY17 funds were previously assigned in PE 0303109N.

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 Integration/ Government Oversight	WR	NUWC : Newport, RI	0.000	0.000		1.254	Nov 2017	1.066	Nov 2018	-		1.066	Continuing	Continuing	Continuing
Software Integration Support	WR	SSC PAC : San Diego, CA	0.000	0.000		0.793	Nov 2017	0.675	Nov 2018	-		0.675	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*	Project (Number/Name) 0728 / *EHF SATCOM Terminals*	

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 Engineering Support	C/CPFF	SYSTECH : San Diego, CA	0.000	0.000		2.348	Nov 2017	1.998	Nov 2018	-		1.998	Continuing	Continuing	Continuing
WAMS Studies and Design	FFRDC	MIT/LL : Marlborough, MA	0.000	0.000		0.500	Jan 2018	0.421	Jan 2019	-		0.421	0.000	0.921	-
		Subtotal	0.000	0.000		4.895		4.160		-		4.160	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
EPS & JALN-M Development Test and Evaluation	WR	SSC PAC : San Diego, CA	0.000	0.000		3.728	Nov 2017	3.006	Nov 2018	-		3.006	Continuing	Continuing	Continuing
Operational Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.000		0.009	Nov 2017	0.000		-		0.000	0.000	0.009	-
		Subtotal	0.000	0.000		3.737		3.006		-		3.006	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
Contract Management	C/CPFF	BAH : San Diego, CA	0.000	0.000		0.232	Nov 2017	0.170	Nov 2018	-		0.170	Continuing	Continuing	Continuing
Program Management	C/CPFF	BAH : San Diego, CA	0.000	0.000		1.556	Nov 2017	1.139	Nov 2018	-		1.139	Continuing	Continuing	Continuing
Travel	Various	SPAWAR : Various	0.000	0.000		0.050	Nov 2017	0.050	Nov 2018	-		0.050	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		1.838		1.359		-		1.359	Continuing	Continuing	N/A

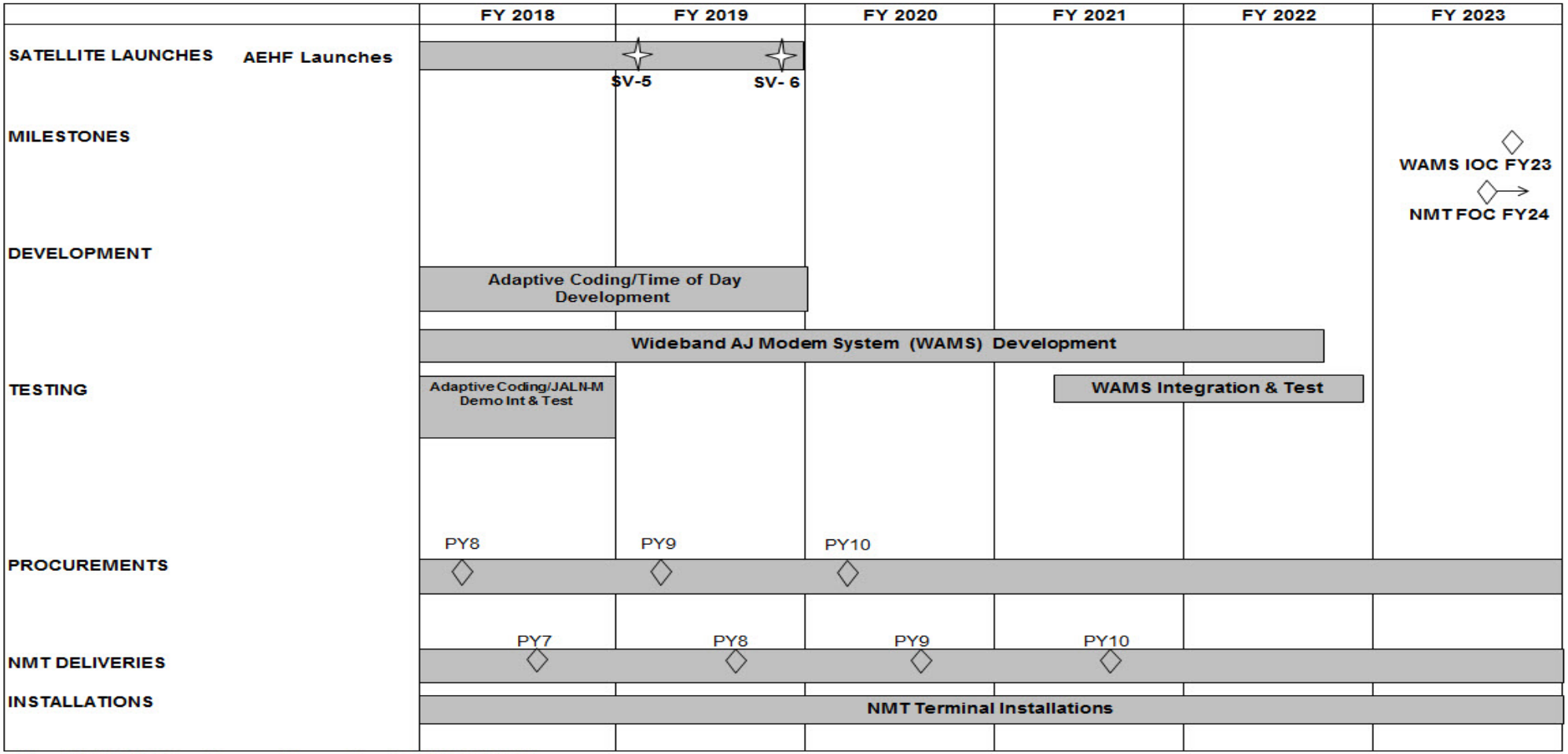
	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		22.361		17.729		-		17.729	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*	Project (Number/Name) 0728 / *EHF SATCOM Terminals*	

	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 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*



Note: FY17 NMT funding profile resides in PE 0303109N.

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 0728 / *EHF SATCOM Terminals*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 0728				
AEHF Launch SV-5	1	2019	1	2019
A2AD Adaptive Coding & JALN-M Integration & Testing	1	2018	4	2018
A2AD Wideband AJ Modem Development	1	2018	3	2022
Procurement Year (PY8)	2	2018	2	2018
Procurement Year (PY9)	2	2019	2	2019
Procurement Year (PY10)	2	2020	2	2020
FRP PY7 Delivery	3	2018	3	2018
FRP PY8 Delivery	3	2019	3	2019
FRP PY9 Delivery	3	2020	3	2020
WAM Integration & Testing	2	2021	4	2022
FRP PY10 Delivery	3	2021	3	2021
AEHF Launch SV-6	4	2019	4	2019
A2AD Adaptive Coding/Time of Day	1	2018	4	2019
WAMS IOC	4	2023	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*				Project (Number/Name) 2472 / *Mobile User Objective Sys (MUOS)*			
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**
2472: *Mobile User Objective Sys (MUOS)*	0.000	0.000	13.965	20.530	-	20.530	14.530	14.860	13.915	14.187	82.590	174.577
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 345

A. Mission Description and Budget Item Justification

In June 2016, based on the results of the Multi-Service Operational Test and Evaluation-2 (MOT&E-2), Director, Operational Test & Evaluation (DOT&E) assessed the Mobile User Objective System (MUOS) not operationally effective or suitable. Increase of funds from FY18 to FY19 is required to conduct Multi-Service Operational Test and Evaluation-2B (MOT&E-2B) in FY19. As a result of the program addressing findings and preparing for MOT&E-2B in FY19, Full Operational Capability (FOC) has been moved to FY20. The MUOS Key Performance Parameter Threshold requires 70% constellation availability through 2030 (FOC + 10 years). Recent analysis predicts that MUOS Wideband Code Division Multiple Access (WCDMA) will fall below this requirement in 2028, therefore an Ultra-High Frequency (UHF) Narrowband satellite communications (SATCOM) Analysis of Alternatives (AoA) is required to satisfy Narrowband requirements beyond the MUOS service life. The increase of funds from FY18 to FY19 funds the AoA.

MUOS provides a worldwide, multi-service population of mobile and fixed-site terminal users with UHF Narrowband, beyond line of sight SATCOM. MUOS significantly increases performance and capacity in support of critical Combatant Command SATCOM priorities. MUOS is the replacement system for the UHF Follow-on (UFO) system, which is currently beyond its design life. MUOS consists of Space, Ground, and User Entry Segments. The Space Segment consists of 5 geosynchronous satellites, one which is an on-orbit spare, and provides both a legacy UHF payload, which is backward compatible with UFO, and a WCDMA payload, which provides 3G cellular-like capability. The Ground Segment consists of four world-wide Radio Access Facilities (RAFs) and two satellite control facilities. Each RAF includes three 60 ft. antennas, and numerous racks of equipment. The RAF in Hawaii includes a Network Management Facility (NMF). The RAFs in Hawaii and Virginia each include a Switching Facility (SF). The User Entry Segment consists of the MUOS waveform that is ultimately integrated into MUOS-capable terminals. The MUOS legacy capability has been in operational use since 2012, and the WCDMA capability transitioned to Early Combatant Command Use in July 2016.

In addition to providing UHF SATCOM for the Department of Defense, the Navy has the overall responsibility to deliver the End-to-End MUOS capability to the warfighter. This responsibility involves systems engineering, integration, and test management of all MUOS system of system activities, to include the integration of the MUOS waveform into MUOS-capable terminals and the subsequent terminal certification testing.

The budget line in FY19 and out is dedicated to completion of the MOT&E-2B activities, system optimization to address the dynamic, worldwide electromagnetic and cybersecurity environment in which MUOS operates, testing to support certification of MUOS-capable terminals, and the UHF Narrowband SATCOM AoA.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Mobile User Objective Sys (MUOS)	0.000	13.965	20.530	0.000	20.530
Articles:	-	-	-	-	-

FY 2018 Plans:
FY18 addresses operational test deficiencies and preparation for FY19 Multi-service Operational Test and Evaluation-2B (MOT&E-2B) activities, particularly addressing the capability to monitor system status and provide situational awareness for system operators. Execute 5 developmental test assist events in preparation for FY19 MOT&E-2B. Address emerging cybersecurity requirements. Support integration of the MUOS waveform into MUOS-capable terminals and execution of certification testing of MUOS-capable terminals in support of Department of Defense terminal programs. Develop a modernized geolocation Ground Segment subsystem in order to meet baseline requirements. Address the dynamic, worldwide electronic magnetic environment through system optimization to ensure capacity is available to the end user.

FY 2019 Base Plans:
FY19 funds activities to prepare for and conduct MOT&E-2B, due to the June 2016 Director, Operational Test & Evaluation (DOT&E) assessment that found MUOS not operationally effective or suitable. These activities include Development and Operational Test Readiness Reviews, Cooperative Vulnerability Penetration Assessment, formal MOT&E-2B, and Adversarial Assessment. Additionally, FY19 funds support the engineering and research efforts as part of the Ultra-High Frequency (UHF) Narrowband satellite communications (SATCOM) Analysis of Alternatives (AoA) initiative. FY19 continues support of integration of the MUOS waveform into MUOS-capable terminals and execution of certification testing of MUOS-capable terminals in support of Department of Defense terminal programs. Continue to address operational test deficiencies, particularly addressing the capability to monitor system status and provide situational awareness for the system operators. Continue to address emerging cybersecurity requirements. Continue development of a modernized geolocation Ground Segment subsystem in order to meet baseline requirements. Continue to address the dynamic, worldwide electronic magnetic environment through system optimization to ensure capacity is available to the end user.

FY 2019 OCO Plans:
N/A

FY 2018 to FY 2019 Increase/Decrease Statement:
The increase in FY19 funds activities to prepare for and conduct MOT&E-2B, due to the June 2016 DOT&E assessment that found MUOS not operationally effective or suitable. These activities include Development and Operational Test Readiness Reviews, Cooperative Vulnerability Penetration Assessment, formal

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
MOT&E-2B, and Adversarial Assessment. Additionally, the FY19 funding increase supports activities for the UHF Narrowband SATCOM AoA: with subject matter experts in support of Space, Ground, Terminal, and Cyber Security, modeling and simulation efforts, research and analysis on the industrial base, contracting options, affordability, concept of operations, and payload alternatives.					
Accomplishments/Planned Programs Subtotals	0.000	13.965	20.530	0.000	20.530

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/2433: *Fleet Satellite Comm Follow-On*	33.723	46.357	66.779	-	66.779	67.380	53.460	45.985	46.907	617.197	3,044.814

Remarks

D. Acquisition Strategy

Currently sustainment and engineering activities are procured via the baseline MUOS Risk Reduction and Design Development contract. The program is working to transition these activities to dedicated sustainment contracts for the Space, Ground and User Entry Segments. Integration of the MUOS waveform into MUOS-capable terminals and execution of certification testing of MUOS-capable terminals are executed primarily by the Navy Working Capital Funded SPAWAR Systems Center Pacific.

E. Performance Metrics

MUOS Goal: Achieve Full Operational Capability in FY 2020.

Metric: Successfully complete 5 developmental test assist events in FY18, and Multi-Service Operational Test and Evaluation-2B FY19.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

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 Contract	C/CPAF	Lockheed Martin : Sunnyvale, CA	0.000	0.000		7.700	Oct 2017	7.850	Oct 2018	-		7.850	0.000	15.550	-
		Subtotal	0.000	0.000		7.700		7.850		-		7.850	0.000	15.550	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	SSC PAC : San Diego, CA	0.000	0.000		1.515	Oct 2017	1.104	Oct 2018	-		1.104	0.000	2.619	-
Operational Test & Evaluation	WR	COTF : Norfolk, VA	0.000	0.000		0.250	Oct 2017	2.048	Oct 2018	-		2.048	0.000	2.298	-
		Subtotal	0.000	0.000		1.765		3.152		-		3.152	0.000	4.917	N/A

Remarks

Increase in Test and Evaluation efforts from FY18 to FY19 funds Test events in preparation for and conduct of MOT&E-2B.

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 Engineering Support	C/CPFF	SBG : Alexandria, VA	0.000	0.000		3.000	Oct 2017	7.000	Oct 2018	-		7.000	0.000	10.000	-
Government Engineering	WR	SSC PAC : San Diego, CA	0.000	0.000		1.500	Oct 2017	2.528	Oct 2018	-		2.528	0.000	4.028	-
		Subtotal	0.000	0.000		4.500		9.528		-		9.528	0.000	14.028	N/A

Remarks

Increase in Services from FY18 to FY19 funds engineering and research efforts in support of UHF Narrowband SATCOM Analysis of Alternatives.

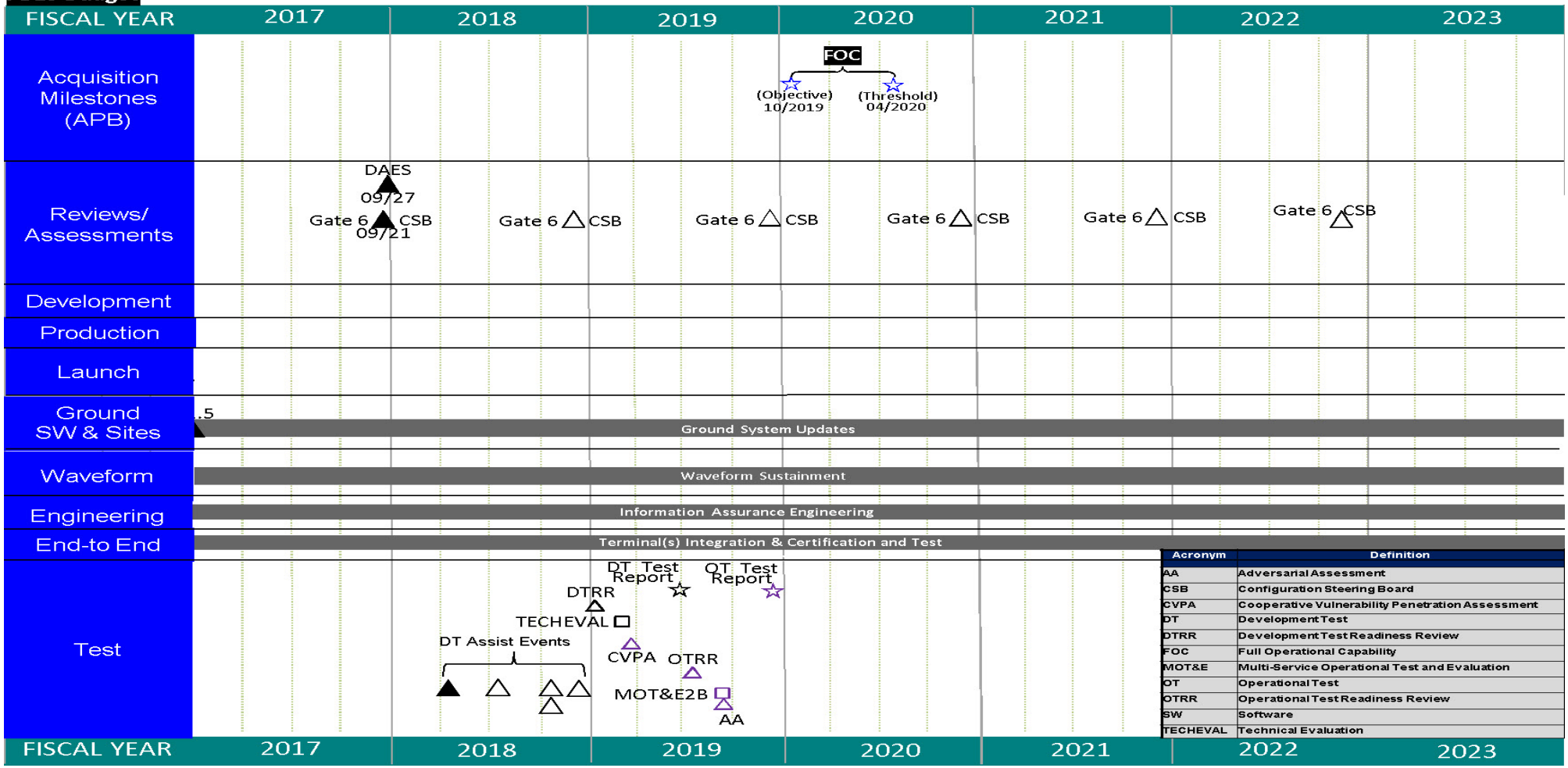
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*	Project (Number/Name) 2472 / *Mobile User Objective Sys (MUOS)*	

	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		13.965		20.530		-		20.530	0.000	34.495	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

PB19 Budget



Acronym	Definition
AA	Adversarial Assessment
CSB	Configuration Steering Board
CVPA	Cooperative Vulnerability Penetration Assessment
DT	Development Test
DTRR	Development Test Readiness Review
FOC	Full Operational Capability
MOT&E	Multi-Service Operational Test and Evaluation
OT	Operational Test
OTRR	Operational Test Readiness Review
SW	Software
TECHEVAL	Technical Evaluation

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 2472				
Information Assurance Engineering	1	2018	4	2023
Terminal Integration, Certification, and Test	1	2018	4	2023
Waveform Sustainment	1	2018	4	2023
Ground System Updates	1	2018	4	2023
Developmental Test Assist Event 1	2	2018	2	2018
Developmental Test Assist Event 2	3	2018	3	2018
Developmental Test Assist Event 3	4	2018	4	2018
Developmental Test Assist Event 4	4	2018	4	2018
Developmental Test Assist Event 5	4	2018	4	2018
Gate 6/CSB FY18	4	2018	4	2018
Developmental Test Readiness Review	1	2019	1	2019
Tech Eval	1	2019	1	2019
DT Test Report	3	2019	3	2019
Operational Test Readiness Review	3	2019	3	2019
MOT&E2B	3	2019	3	2019
Adversarial Assessment	3	2019	3	2019
OT Test Report	4	2019	4	2019
Gate 6/CSB FY19	4	2019	4	2019
Full Operational Capability (FOC) Objective	1	2020	1	2020
Full Operational Capability (FOC) Threshold	3	2020	3	2020
Gate 6/CSB FY20	4	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 2472 / *Mobile User Objective Sys (MUOS)*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Gate 6/CSB FY21	4	2021	4	2021
Gate 6/CSB FY22	4	2022	4	2022
Gate 6/CSB FY23	4	2023	4	2023
Cooperative Vulnerability Penetration Assessment	1	2019	1	2019

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*	Project (Number/Name) 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*	

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
3398: *Enterprise SATCOM Gateway Modems (ESGMs)*	0.000	0.000	1.510	0.915	-	0.915	0.002	0.000	0.000	0.000	0.000	2.427
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Navy Global Broadcast Service (GBS) Program is the Navy component of the Joint Military Satellite Communications (MILSATCOM) program that delivers the continuous flow of high-speed, high-volume communication and information flow for deploying, deployed, on the move, and garrisoned forces. The GBS system supports the Navy Strategic Plan and equips warfighters with a proven Assured Command and Control (C2) capability. GBS provides Satellite Communications (SATCOM) capability for forces afloat, ashore, and Naval Special Warfare Command.

The Enterprise SATCOM Gateway Modem (ESGM) is the DoD Chief Information Officer directed solution to satisfy the Transmission Security (TRANSEC) requirement. This modem will replace the existing modem in the GBS System. Testing and fielding of the ESGM is a joint venture, operationally directed by the Defense Information Systems Agency (DISA) and the Air Force as the lead service. Additionally, the ESGM will continue to enable GBS reception of the Digital Video Broadcast - Satellite 2nd Generation (DVB-S2).

FY19 GBS activities will complete Joint GBS integration and support the Joint GBS DT/OT event.

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 SATCOM Gateway Modems (ESGMs)	0.000	1.510	0.915	0.000	0.915
Articles:	-	-	-	-	-
FY 2018 Plans: DISA is responsible for the selection of the DoD Wide Modem. After selection is made, DISA will complete an initial DT/OT. Complete integration and testing necessary to support a DISA led Enterprise Satellite Communications Gateway Modems (ESGM) technical baseline. Complete Navy-specific application integration testing and report on compliance with Navy C4I systems.					
FY 2019 Base Plans: Air Force will follow up with a Joint Services DT/OT. Complete integration and testing necessary to support and finalize the Joint led GBS-ESGM technical baseline. Complete test execution, qualification and reporting for Joint-specific GBS and Navy-specific requirements during GBS Joint ESGM DT and OT activities.					
FY 2019 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*

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 $.595M from FY18 to FY19 is due to DISA qualification reporting and Navy-specific application integration testing not required for FY19 activities.					
Accomplishments/Planned Programs Subtotals	0.000	1.510	0.915	0.000	0.915

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The GBS program reached a Full Rate Production Decision on 24 Oct 2008 and is in sustainment. The Enterprise Satellite Communications (SATCOM) Gateway Modem (ESGM), the Commercial Off-The-Shelf (COTS) Internet Protocol (IP) modem, provides Transmission Security functionality in support of DoD CIO direction to implement Information Assurance for all transmission media.

E. Performance Metrics

The RDT&E goal for the GBS program is to create a military satellite communications system that supports current and future requirements for Assured Command and Control (AC2) and Information Assurance.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*	Project (Number/Name) 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*	

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	SSC PAC : San Diego, CA	0.000	0.000		0.313	Nov 2017	0.188	Nov 2018	-		0.188	0.000	0.501	-
Systems Engineering	WR	NUWC : Newport, RI	0.000	0.000		0.274	Nov 2017	0.165	Nov 2018	-		0.165	0.000	0.439	-
Systems Engineering	WR	SSC LANT : Charleston, SC	0.000	0.000		0.322	Nov 2017	0.200	Nov 2018	-		0.200	0.000	0.522	-
		Subtotal	0.000	0.000		0.909		0.553		-		0.553	0.000	1.462	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	SYSTECH : San Diego, CA	0.000	0.000		0.000	Nov 2017	0.163	Nov 2018	-		0.163	0.000	0.163	-
Operational Test & Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.000		0.271	Nov 2017	0.133	Nov 2018	-		0.133	0.000	0.404	-
Developmental Test & Evaluation	WR	SSC PAC : San Diego, CA	0.000	0.000		0.221	Nov 2017	0.000		-		0.000	0.000	0.221	-
		Subtotal	0.000	0.000		0.492		0.296		-		0.296	0.000	0.788	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	C/CPFF	BAH : San Diego	0.000	0.000		0.100	Nov 2017	0.061	Nov 2018	-		0.061	0.000	0.161	-
Travel	Reqn	SPAWAR : Various	0.000	0.000		0.009	Nov 2017	0.005	Nov 2018	-		0.005	0.000	0.014	-
		Subtotal	0.000	0.000		0.109		0.066		-		0.066	0.000	0.175	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		1.510		0.915		-		0.915	0.000	2.425	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 1203109N / *(U)Satellite Communications (SPACE)*	Project (Number/Name) 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*	

	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 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*

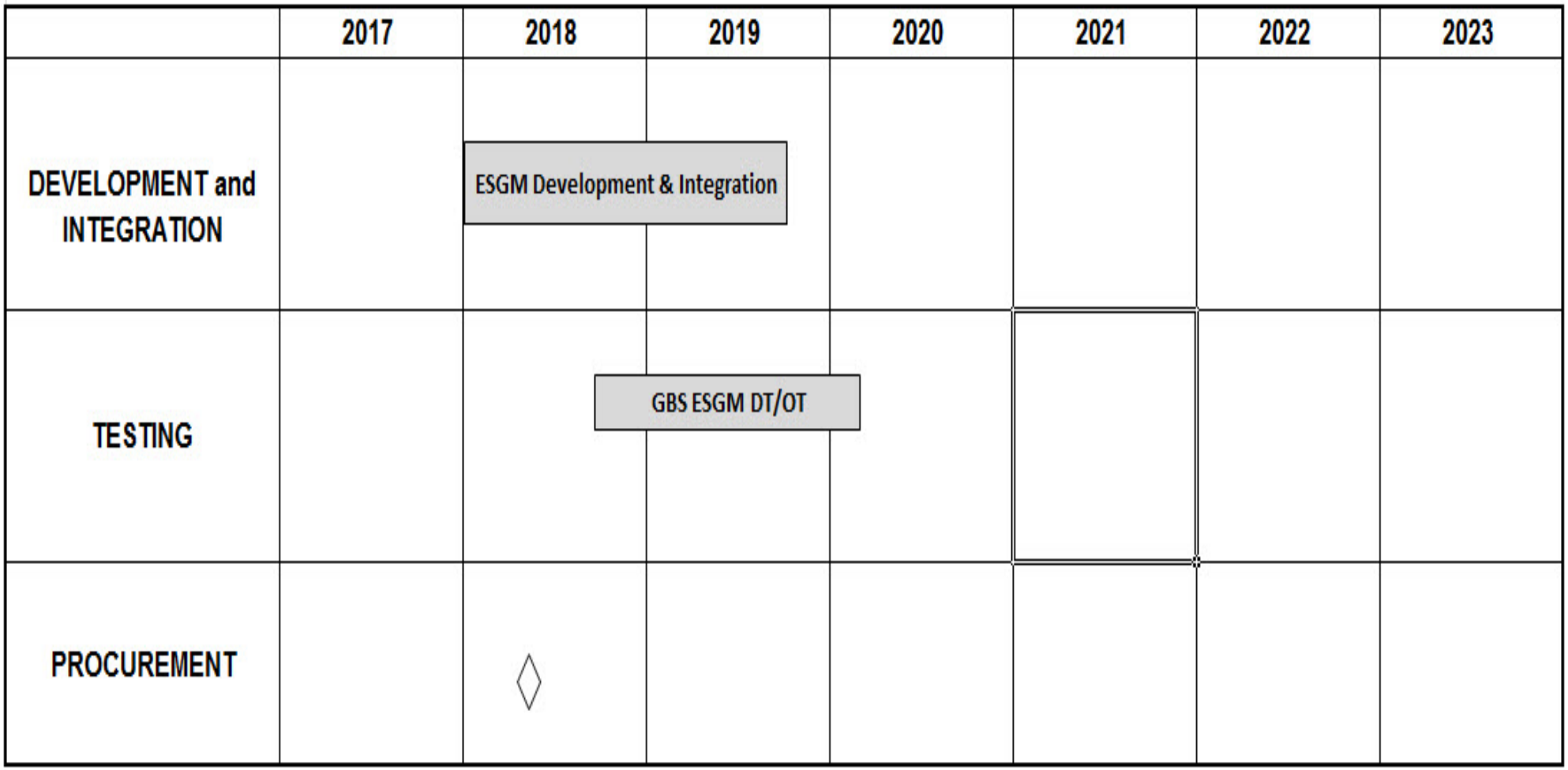


Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 1203109N / *(U)Satellite Communications (SPACE)*	**Project (Number/Name)** 3398 / *Enterprise SATCOM Gateway Modems (ESGMs)*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Proj 3398				
ESGM Development and Integration	1	2018	3	2019
GBS ESGM DT/OT	3	2018	1	2020
ESGM Test Equipment Buy	2	2018	2	2018

THIS PAGE INTENTIONALLY LEFT BLANK